Building a regulatory framework for 'remote aerodrome ATS' and Cyber Security

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- Requirements on aerodrome ATS provision exists

- Requirements for the assessment of change to functional systems exist

- Conclusion:

RMT – Objectives

- EASA Rulemaking Task initiated 2014 to:

  - Address SESAR developments

  - Address expectations from the ATM community

  - Support implementation initiatives within Europe (and worldwide)

  - Support technological development

  - Support a cost-efficient and proportionate ATS

  - Facilitate harmonised implementation and provide a harmonised and level playing field

  - Support and recognise standardisation activities undertaken by EUROCAE

RMT – Set-up & deliverables

➤ **Phase 1, 2014-2015**

  ➤ Scope limited to 'single mode of operation' and mainly 'low density aerodromes'

  ➤ Completed summer 2015 via the publication of:

    ➤ EDD 2015/014/R: 'GM on the implementation of the RT concept for single mode of operation'

    ➤ EDD 2015/015/R: AMC & GM to Reg. (EU) 2015/340 'Requirements on ATCO Licensing regarding remote tower operations'

      (EDD = EASA Executive Director Decision, GM = Guidance Material, AMC = Acceptable Means of Compliance)

➤ **Phase 2, 2016-2018**

  ➤ RMT.0624 re-launched summer 2016, under the same Terms of Reference (ToR)

  ➤ Extended scope to expand into more complex mode of operations, taking into account:

    ➤ the latest SESAR results + other available research/validation results

    ➤ gained operational experiences

  ➤ Consider adoption of industry standards (EUROCAE ED-240, ED-240A when available).

  ➤ New Notice of Proposed Amendments (NPA) published: **20 Dec 2017**

  ➤ Public consultation closed: **3 April 2018**

  ➤ Expected publication of the expanded EASA material/revised ED Decision(s): **Q1 2019**

Approach & NPA contents

- **NPA 2017-21** consists of two main regulatory proposals:

  - Guidelines on 'Remote Aerodrome Air Traffic Services (ATS)'
    - Will replace the existing EASA GM on Single Remote Tower.
    - Extended in scope, covering also more complex mode of operations (e.g. 'busier/larger airports', 'multiple mode of operation' and 'contingency solutions') and the use of new technical enablers.
    - Enhanced/improved, taking into consideration gained operational experiences and new R&D results.

  - GM* & AMC** to the ATCO training and licensing Regulation (2015/340)
    - An updated set of GM & AMC, to replace the existing corresponding GM & AMC.
    - Refined and extended in scope to cover also e.g. multiple mode of operation.

* GM = Guidance Material, ** AMC = Acceptable Means of Compliance

Scope of the NPA / regulatory proposals

➤ <u>Generic</u> guidelines (i.e. not limited to specific operational applications/contexts)

➤ Main target audience;
  ➤ ATS providers & aerodrome operators,
  ➤ NSAs/Competent Authorities,
  ➤ *(Also a foreseen interest from the manufacturing industry)*

➤ Addressing <u>operational/procedural</u>, <u>technological</u> and <u>human resources</u> aspects of remote aerodrome ATS and <u>the management of change</u>, in order to facilitate:
  ➤ safe operations,
  ➤ that the ATS objectives are fulfilled,
  ➤ a harmonised implementation throughout EASA Member States and provide a level playing field for stakeholders.

➤ Social and economic aspects <u>not</u> in the scope
  ➤ These aspects hugely depending on the individual case of implementation and need to be addressed at a local level.

Reasoning for the regulatory approach

➤ ## Why producing 'soft law' instead of 'hard law'?

- ➤ Need to go to **performance-based regulatory environment** when addressing a very fast evolving technology. A general tendency is to rely on industry standards and soft law for supporting and enabling safe implementation of new technology.

- ➤ **Same service (aerodrome control service or AFIS)** regardless if provided from a conventional/remote tower and no change in the requirements for assessment of change to functional systems by ATS service providers, therefore the **high level regulations are not impacted**.

- ➤ Easier, more useful for the ATSP and their CA to have a **single source of information** encompassing all the aspects together, rather than specific AMC or GM to higher level regulations, which would make the overall application more complex.

- ➤ As technical solutions and implementations are so different, there are no common elements for a common rating endorsement in the ATCO licensing, therefore the **unit endorsements can sufficiently cover the training of ATCOs.**

EASA implementation support

➤ Following publication, EASA have the ambition to set up a 'remote aerodrome ATS implementation and support action':

  ➤ A forum to be created with a view to exchange best practises for the implementation of the remote tower project as well as their oversight.

  ➤ The forum can e.g. provide a platform for questions and exchange of experiences.

  ➤ Possibilities for EASA to provide support to competent authorities and ATS providers, for implementation projects within Europe as well as outside Europe.

Related regulatory/standardisation activities

- **ICAO**

  - Amendment 8 to Doc 4444 (PANS-ATM), which fully enables remote aerodrome ATS, in force since 8 November 2018.

  - The amendments include, inter alia;

    - A new definition for 'visual surveillance/presentation system'.

    - A new chapter 7.1.1.2.1 stating that visual observation can be achieved through direct out-of-the-window observation OR through indirect observation utilizing a visual surveillance system.

    - A new "Note" referring to the EASA Guidance Material, thereby giving it global status.

  - ICAO ATM Operations Panel (ATMOPSP) has reinitiated the 'remote ATS' Working Group, for the development of ICAO guidelines.

    - AN-Conf/13 likely to provide the basis for this work (ToR yet to be defined).

    - Several Working Papers related to remote/digital ATS submitted to AN-Conf/13.

Related regulatory/standardisation activities

- **EUROCAE**

  - WG-100 "Remote and Virtual Towers"

  - ED-240 published September 2016:
    - First 'Minimum Aviation System Performance Specification (MASPS) for Remote Tower Optical Systems'
    - Specifying the end-to-end performance of the optical (camera) system
    - Did not consider augmentation functions or other sensors (then cameras)

  - ED-240**A** published October 2018:
    - Extension of ED-240 to include "visual target tracking" technologies
      - *Typical use cases: highlighting of moving objects in the visual presentation & PTZ/binocular camera automatic object following*

  - To be followed by a further extension, ED-240**B** (as so far planned):
    - Inclusion of "radar tracking", i.e. information from non-optical surveillance systems/sensors
      - *Typical use case: radar labels (aircraft & vehicles) overlaid in the visual presentation*
    - Anticipated late 2020

EU approach to Cybersecurity

Elements driving the cybersecurity risks

Aviation is a "System of Systems", covering all aviation domains, and where products, services and organisations are increasingly interconnected.

Cybersecurity risks have no borders and are driven by the notion of malicious intent, where vulnerabilities are exploited and an accident is not a fortuitous event **(as opposed to "classic safety")**.

Cybersecurity risks evolve very quickly, which requires industry and authorities to do business differently.

And the EU Cyber Strategy will ...

Take due account of interdependencies between safety and security *(both at aircraft and ground levels)*

Facilitate the view on the full cybersecurity risk landscape and the identification and sharing of new risks *(ECCSA – European Centre for CyberSecurity in Aviation)*

Promote international cooperation and harmonization

Create a strong and flexible regulatory framework supplemented by Industry Standards *(for aircraft and organisations)*

Ensure a high level of cybersecurity knowledge and competence

How is this being coordinated?

The ESCP (European Strategic Coordination Platform), including:

An Executive Committee (ESCP-EC) at the higher level

A Technical Advisory Committee (ESCP-TAC) at the technical level
- **Includes several work-streams (groups) on the following subjects:**
  - **The European Cybersecurity Strategy.**
  - **Regulatory activities.**
  - **Coherence and consistency of risk management processes within different domains and organisations.**

The *"European Strategic Coordination Platform (ESCP)"*

Composed of Members and Observers:

- **Members:**
    - **European Commission**
    - **Other EU Agencies and Organisations (EUROPOL, EASA, ENISA, CERT-EU, EUROCONTROL, SESAR)**
    - **European Defence Agency**
    - **States (6 EU Member States, ECAC)**
    - **EU relevant Aviation industry associations (ASD, CANSO, ACI, A4E, IATA, GAMA, ECA...)**
- **Observers: ICAO, FAA, TCCA, AIA, NATO...**

International Cooperation & Harmonisation

Cooperation at global level through the ICAO SSGC (Secretariat Study Group on Cybersecurity):

- Coordinates all cybersecurity activities at ICAO level.
- ACI, CAA Israel, CAA South Africa, CANSO, EASA, DG MOVE, Eurocontrol, FAA, FOCA, ICCAIA, IATA, MoT Singapore and SESAR JU
- Essential to ensure coordination of these activities with the ESCP so a common European voice is taken to ICAO.
- Coordination performed with other ICAO Panels (RPAS, Airworthiness, Safety Management…)

Other cooperation initiatives with:

- **FAA:** Mainly on regulatory activities and standards.
- **Military sector:** Cooperation with NATO and European Defence Agency.
- **ECAC:** Through the "ECAC Cyber Study Group".
- **Other EU Agencies, covering other transport modes:** European Maritime Agency and European Railway Agency.
- **National Security Agencies:** Studying a design security evaluation scheme for certification of TC/STCs.

EASA regulatory activities on cybersecurity for the aviation sector

One of the main elements of a succesful aviation cybersecurity strategy is...

Create a robust and flexible regulatory framework supplemented by Industry Standards, covering all aviation domains

With this objective, EASA included in the 2018-2022 EPAS (European Plan for Aviation Safety) two rulemaking tasks:

- **RMT.0648 for aircraft, engines and propellers.**
- **RMT.0720 for organisations.**

RMT.0648 (for aircraft, engines, propellers)

Rulemaking Task RMT.0648 "Aircraft Cybersecurity": *The objective is to ensure a robust product design to avoid cybersecurity risks.*

Next Deliverable: Notice of Proposed Amendment (NPA) expected before end 2018

Key aspects:

- **Harmonised with the FAA. Takes into account the recommendations to the FAA of the ASISP (Aviation Systems Information Security/Protection) ARAC (Aviation Rulemaking Advisory Committee) group, where EASA participated.**

- **Include amendments to the Certification Specifications and Acceptable Means of Compliance (AMC).**

- **There will be references to Industry Standards (ED-202A and ED-203A).**

This task is not being discussed within the ESCP.

RMT.0720 (for organisations)

Rulemaking Task RMT.0720: *Requirements for the management of cybersecurity risks for organizations in all aviation domains (design, production, maintenance, operations, aircrew, ATM/ANS, aerodromes).*

Next Deliverable: *Notice of Proposed Amendment (NPA) expected first half 2019.*

Key aspects:

- The objective is to ensure that organisations are able to manage cybersecurity risks, including the need for an Information Security Management System (ISMS) and occurrence reporting.

- For organizations in all aviation domains, and for competent authorities (with some exceptions to ensure proportionallity to the risks).

- Including high-level, risk and performance-based requirements (flexibility, no frequent amendments).

- Complemented by AMC, Guidance Material and Industry Standards.

- The structure should facilitate to the organisations the future integration of ISMS with existing Safety Management Systems (SMS) and Security Management Systems (SeMS).

This task is being discussed within the ESCP.

RMT.0720 (for organisations)

Current status of the proposed rule (ongoing discussions taking place in the ESCP "Regulatory Work Stream")

- **Objective:** **Requirements to be met by organisations in order to identify, protect, detect, respond and recover from those information security events which could potentially affect aviation safety or could affect the European Aviation Traffic Management Network (EATMN).**

- **Applicable to:**

  - **POA, DOA.**

  - **Part-145 orgs., future Part-CAMO orgs (Opinion 05/2016).**

  - **Commercial air transport operators (CAT), Commercial specialised operators, Non-commercial operations with complex motor-powered aircraft, Non-commercial specialised operations with complex motor-powered aircraft.**

  - **Training Organisations (ATO, ATCO), Aeromedical Centres and FSTD Operators.**

  - **ATS, MET, AIS, DAT, CNS, ATFM and ASM Providers and the Network Manager.**

  - **Aerodrome Operators and Apron Management Service Providers.**

- **Not applicable to:** **Future Part-CAO orgs (Opinion 05/2016), Part-147 organisations, private & SPO operators of non-complex aircraft, DTO (aircrew).**

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