EASA VTOL Department
Rotorcraft Safety Roadmap – Highlights 2020

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9 December 2020

Your safety is our mission.

An Agency of the European Union
The main deliverables of the Roadmap published this year and the ongoing activities of the Rotorcraft Safety Roadmap are presented.

Overview of what is coming next and the subject that the agency is working on.
General update - Looking back at 2020

The helicopter community has been instrumental during the Covid19 crisis and delivered services

Thanks to all stakeholders!
EASA COVID 19 actions

Objective: Anticipate the impact of the COVID-19 crisis on the Aviation Industry and support the Industry in what could be a long recovery phase.

Actions:
- Creation of cross directorate evaluations boards/committees. Including Experts, PCM’s and other staff members.
- Approving design changes related to cabin conversions, medical evacuation and cargo
- Publication of a policy (CM) on remote witnessing of certification tests.
- Publish urgent Safety Information Bulletins
- Publish guidance material and practical scenarios related to product and design Certification
- Changing Implementation Regulations
- Issuing exemptions for National Competent Authorities
- Updating Safety Directives
- Publication of guidelines – Use of Cargo Tracking devices to support vaccine transportation
- Other new Health related Activities
- Supporting Industry bio-secure research
- Passenger Locator Form project
Return to Normal Operations (RNO)

Helping DOAs to have helicopter ready for patient transportation

- Design changes free of charge up to July 2020
- Guidance to helicopter cabin installation

Helping pilots to return safely to flying

- Making sure that pilots will go back safely to flying was a key objective of the team involved in the RNO. The Safety promotion team: Michel and John, developed and published guidance, training and videos:

  - Video for pilots
  - Accompanying article and the EASA by GASCo tutorial
  - EASA (Together4Safety) Rotorcraft Community COVID-19 page
VTOL: major Certification projects

Certified July 2020 – new TC
Airbus Helicopters H160
New Medium Class Rotorcraft

Certified June 2020 – Derivative
Airbus Helicopters BK-117 D3 – 5 bladed rotor

Certified June 2020 – Derivative
Leonardo AW189 K
New Engine version

• Review of Aviation Safety Issues Arising from the COVID-19 Pandemic
• NAA support on helicopter specific COVID-19 installations
CT.3 Vertical Take-Off & Landing

→ Trend in Rotorcraft
  → Increase of applications
    → +35% Major Change
    → +23% STC
    → +29% Major Change to STC
  → Overall + 3% open project
  → Overall FH around -15%

→ Rotorcraft sector resisted better the COVID-19 crisis
→ However, need to see how 2021 will look like

LAST UPDATE: 06.11.2020
Rotorcraft Safety Roadmap Update 2020

Covid19 impact
Present the reprioritisation and the new activities developed to support the industry in dealing with the Covid19 crisis.

Implementation
The main deliverables published this year and the ongoing activities.

Coming next
Give a short overview of what is coming next and the subject that the agency is working on.
Vision and Strategic objectives

Endorsed by EASA and published in Dec 2018

Vision:
Achieving significant safety improvement for Rotorcraft with a growing and evolving aviation industry

Strategic objectives:
1. Improve the overall Rotorcraft safety by 50% within the next 10 years.
2. Make positive and visible changes to the Rotorcraft safety trends within the next 5 years.
3. Develop performance-based and proportionate solutions.

1. Number of Rotorcraft accidents in Europe with at least a fatality or a serious injury.
2. Additional KPIs based on European Risk Classification Scheme (ERCS).
3. Complemented by data collection activity using D4S to built robust accident rates data.
Roadmap report

- Endorsed by EASA in December 2018,
- Contain ambitious recommendations in all domains,
- Significant communication,
- Actions for all stakeholders.

Roadmap project plan

- Project plan,
- Creation of an Agency horizontal project to implement these recommendations,
- Organise the activities in Wok-streams,
- Define for each work stream objectives and deliverables,

Roadmap Report Q3-Q4 2018
Start January 2019
Mid-term review June 2021
Final review Dec 2023
Covid 19 and Rotorcraft Safety Roadmap

→ Reprioritisation of the actions toward supporting the industry,
  
  *Strengthen strategic objective 3 to “Develop performance-based and proportionate solutions”*,

→ Cancellation of the all international activities and workshops,

→ Rulemaking Resources re-directed to support the Exemptions and facilitate the continuity of operations during the Crisis. EPAS re-prioritisation and RMT delayed.

→ Support the Return to Normal Operations (RNO) project

→ Medium/long term impact on the helicopter operators?
Covid19 impact
Present the reprioritisation and the new activities developed to support the industry in dealing with the Covid19 crisis.

Implementation
The main deliverables published this year and the ongoing activities.

Coming next
Give a short overview of what is coming next and the subject that the agency is working on.
Work-stream Design

Helicopter Safety Technology Survey

→ A joint survey on the helicopter safety technologies was made together with the International Helicopter Safety Team.
→ 1376 answers were received.
→ The results are available online and are providing inputs for the work-stream on design.

Voluntary design improvements

→ Work engaged with the Manufacturers to develop on a voluntary basis product improvements.
→ Net Safety Benefit: The Agency is working on a Certification Memo aiming to facilitate the introduction of technologies having safety benefits in the cockpit. It will provide a relaxation of the compliance demonstration effort for the retrofit of system having safety benefits.
Main Actions – Example Squirrel

**Crash Resistant Fuel System**
- Certification of 27.952 compliant configuration for AS 350 B3 and EC 130,
- Validation of STC for legacy fleet,
- Second source bladder certification.
- Implementation of ambitious Retrofit Plan (EASA SIB 2017-018R1).

**Engine Overspeed Protection**
- Certification of EOP for Arriel 2D and Arriel 2B1 (ref EASA SIB 2019-010).

**Occupant Protection**
- Certification of AFT pax seats 27.562 compliant configuration.
- Certification of pilot seats 27.562 compliant configuration.

**Hydraulic System**
- Hydraulic training improvements (EASA SIB 2018-013)
- Dual hydraulic architecture improvement.
- New TR accumulator.
- Increase of pressure on single hydraulic (feasibility phase).

**Other actions**
- Affordable Autopilot STC with yaw control.
- Alert Systems STC, Main Rotor Strike Alerting System.
Work-stream Design - Promote Technologies with Safety Benefits

EASA internal strategy paper to **Promote Technologies with Safety Benefits on helicopters** and define the approach for toward Net Safety Benefit.

1. Introduce proportionality in initial airworthiness certification

   ✓ Part21 light, RMT.0712 Proportionality in CS27.1309, CS-STAN update ongoing

2. Review the technologies that are available that may bring operational safety benefits to helicopters

   ✓ EASA internal review, discussions with some OEMs, NLR study and IHSF survey

3. Promote the voluntary retrofit and installation of systems and equipment having safety benefits

   ✓ EASA article *Flight Data Recorders for Light Helicopters*, accompanying the EASA SIB 2019 15 R1 *Flight Recorders on Small Rotorcraft*. 
Work-Stream on CS modernisation

In 2020, the Agency published:

- **Regular update of CS-ETSO**: These amendments are expected to reduce the regulatory burden for the validation of FAA TSO authorisations by EASA and vice versa, to increase cost-effectiveness of compliance demonstrations and to reflect in CS-ETSO the technical state of the art.
- **Update of AMC-20** (amt 19) on aircraft cybersecurity
- Regular updates of miscellaneous nature (RMT.0457)
- OPR, AEH (RMT.0643); IFE, occurrence reporting etc (RMT.0561)
- CS-MMEL / GEN-MMEL, Issue 2
- CS-MCSD – Maintenance Certifying Staff
RMTs affecting CS-27/29 (EPAS 2020-2024)

- **RMT.0128 RU CS-27/29**
  - CS-27
  - CS-29
  - CS-25

- **RMT.0134 RU AMC to CS-27/29**
  - CS-27

- **RMT.0127 Pilot compartmnt view**
  - CS-27
  - CS-29

- **RMT.0249 Recorders installat**
  - TOR

- **RMT.0648 Cybersecurity**
  - CS-25
  - CS-23
  - CS-27

- **RMT.0709 R/c hoist issues**
  - CS-27
  - CS-30 CS-ETSO

- **RMT.0711 Critical rotor compts.**
  - CS-23

- **RMT.0712 R/c safety assessmt.**
  - CS-27
  - CS-29

- **RMT.0713 R/c human factors**
  - CS-27
  - CS-29

- **RMT.0714 R/c fly by wire**
  - CS-29

- **RMT.0128 RU CS-27/29**
  - NPA

- **RMT.0134 RU AMC to CS-27/29**
  - Dec-CS

- **RMT.0127 Pilot compartmnt view**
  - Dec-CS

- **RMT.0249 Recorders installat**
  - Dec-CS

- **RMT.0648 Cybersecurity**
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- **RMT.0713 R/c human factors**
  - Dec-CS

- **RMT.0714 R/c fly by wire**
  - Dec-CS

- **TOR**
  - Coming soon

- **Dec-CS**
  - NPA

- **Q1/2020 to Q2/2022**

- **TOR**
  - Dec-CS

- **Dec-CS**
  - NPA

- **TOR**
  - Coming soon

- **Dec-CS**
  - NPA

- **TOR**
  - Coming soon

- **Dec-CS**
  - NPA

- **TOR**
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- **TOR**
  - NPA

- **Dec-CS**
  - NPA
RMTs affecting CS-27/29 (EPAS 2020-2024)

- RMT.0724  R/c FCOM
- RMT.0725  R/c oil monitoring
- RMT.0726  R/c bird strike

Timeline:
- Q1/2020: TOR
- Q2/2020: TOR
- Q3/2020: TOR
- Q4/2020: TOR
- Q1/2021: TOR
- Q2/2021: TOR
- Q3/2021: TOR
- Q4/2021: TOR
- Q1/2022: TOR
- Q2/2022: TOR

NPA

Dec-CS
RMTs affecting Part-26 (EPAS 2020-2024)

- **RMT.0120** Helicopter ditching
- **RMT.0710** Occupant Survivability
- **RMT.0725** R/c oil monitoring
- **RMT.0726** R/c bird strike
Work-Stream on Training safety

→ Creation of the Helicopter Group of NAA Experts (HEG)
→ Start of the work with NAAs on some action of the Roadmap

2020: NAA nominated members. Kick-off meeting. Working meeting

→ RMT.196 WP3 to address Virtual Reality Simulators. CS-FSTD(Rotorcraft) and FCS rotorcraft (Helicopter/VTOL/PL) – ToR published and Group Composition completed


→ Two internal papers on the review of the PPLH provisions and the helicopter instructor certificates have been developed and given to the relevant RMT Teams for consideration.

Deliverable 2020: Two internal papers based on the outcome of the survey to NAAs and ATOs done in 2019.
Deliverable 2020: NPA to be published in Dec as part of RMT.0678. Revalidation requirement for PPLH pilots.

Approach toward introducing regulatory changes:

→ Benefit from ongoing RMTs close to NPA stage to feed “quick-wins” such as re-validation requirement for PPLH, RMT.0678
→ Create a new sub-task in the regular update of FCL to include “a limited number of other non-controversial recommendations stemming for the GA and Rotorcraft Safety Roadmap.
→ To address the Helicopter Instructor Qualification process in the view of simplification and of the introduction of the CBTA concept as an alternate to the traditional process, RMT.0194
Training safety

→ Helicopter Flight Instructor Guide

→ Revision 3 stands for:
  → Re-branding from former EHEST to EASA/Together4Safety publication
  → content equal to previous EHEST published revision 2 correcting for typos and editorial inconsistencies, in a format that is easily adaptable to any form of publishing
  → an invite to further improve the content, i.e. on practical Threat and Error Management - TEM
The next big concept proposed is the introduction of a voluntary rotorcraft safety rating scheme. Such a scheme is used in the automotive industry with the crash test programmes Euro NCAP. It is a good way to give an incentive for safety improvements to their vehicles and differentiate themselves (from the competition).

1. Review of Safety Rating Schemes worldwide
   - Survey across the industry of the Safety Rating Schemes available
   - Particular emphasis on automotive industry
   - Review and compare the Schemes based on a set of defined criteria

2. Concept evaluation for a Rotorcraft Safety Rating Scheme
   - Define objectives and aim of a rotorcraft Safety Rating Scheme
   - Apply the analysis of the first presentation to suggest a concept

3. Initial discussions with the industry on the subject

Extend to environmental criteria?
Work-Stream on training devices and Simulators

→ **Objective:** to facilitate and promote the development and use of new innovative and cost-effective training devices.

→ **Plan:** The regulatory framework for initial (FCL) and recurrent pilot training (OPS) will be adapted. Training providers will first analyse the FCL/OPS regulatory training objectives and then identify the device requirements and training tool needs. The identified needs will be subsequently matched with the appropriate training tool available on the market.

→ **Ongoing actions:**
  → IPC with VR Motion,
  → Support to SC to CS FSTD development (with FOCA),
  → Definition of the training needs,
  → Link between training device capability and training needs.
  → **Strongly impacted by Covid-19.**
Work-Stream - Safety Promotion

1. Rotorcraft Together4Safety Community Website now launched
   → Material developed through a collaborative approach with industry partners in the ESPN-R
   → 1 Poster, 8 videos, 18 articles and over 400,000 views – we are really starting to reach the community
   → Stand by for the launch of the latest video involving World Rally Champion – Ari Vatanen

2. An exciting plan awaits for 2021
   → Covering a wide range of operational and systemic topics (Hoists, Sling Load, SMS, Flight Instruction)
Work-stream on simplification

Study on the Administrative Burden for small helicopter operations:

→ The focus is on helicopter OPS and Aircrew rules,
→ Contract signed, activity started and concluded in Nov 2020,
→ Ecorys and the NLR performed an review of the rules and provisions that impose unnecessary administrative burden to small helicopter operators,
→ In-depth interviews with NAAs and small helicopter operators were performed and will provide first hand information,
→ Proposals for regulatory changes will be analysed into a Best Intervention Strategy.

Work-stream on simplification

→ Study of the financial size of the helicopter industry.
   → Part of the wider study “Social Indicators Data Collection to Support Impact Assessment, Monitoring and Evaluation Activities (Task 2)“, led by the Impact Assessment Team SM,
   → Final report released in July 2020 but the data are no more directly useful.

   **Deliverable 2020: Final Report.**

→ A review of the financing possibility at European-level
   → The EASA Trainees made a review of the funding possibilities at European-level for helicopter operators to implement new safety systems and equipment.
   → They analysed the current EU funding programmes and interviewed the EASA Research team and the Chief Engineer for guidance
   → A informal WebEx was organised with company in Brussels specialised in getting EU findings.

   **Deliverable 2020: Paper published.**

→ SMS Manual for small helicopter operators. **Coming soon.**
Coming next: Helicopter AWO

Main feature: Enable helicopter onshore IFR

→ increase the number of available and accessible destination alternates, including the option to use GNSS only at destination and alternate.
→ Ensure that IFR operating minima and planning minima match the capability of helicopters and are at or below the standard VFR minima.
→ Reduce VFR minima on a hybrid IFR/VFR flight with PinS VFR departures/approaches.
→ Avoid prohibition of IFR approaches to non-aerodromes
→ Provide additional flexibility for helicopter IFR.

→ Additional features:
  → Use of NVIS for visual segments of an IFR flight
  → Use of EFVS, including operational credit when flying to runways
  → Modernisation of Offshore approaches: extension to NCC and SPO, and use of OEM designed offshore approaches
  → Update regarding coastal aerodromes.
Coming next: Helicopter training and checking

→ Enables multi-pilot operations of single-pilot certified helicopters on a voluntary basis.
→ Simplifies operations on more than one type or variant of helicopters: SEP and SET groups of types are created. The maximum number of types becomes 3 types or groups of types.
→ CAT: Updates checking schemes, CRM assessments and increases the use of simulators
→ Extends the use of CAT alleviations to non-CAT including CAT A to A operations (circular flights)
→ Simplifies aerodrome knowledge requirements for day VFR
→ Introduces a new training and checking scheme for SPO and new AMC and GM for NCC
→ Non-commercial operations: Introduces a policy for the crediting of training delivered by other persons or organisations.

→ Interface with AWO: Simplifies access to helicopter instrument flight.
  → merger of the SE.IR(H) and ME.IR(H) rating into a single IR(H).
  → crediting of certain FSTD hours towards the instrument flight experience required in CAT IFR single-pilot operations.
Part 21 Light - Overview

Current Part 21

- Standard Type Certificate process
- Type Certificate
- Certificate of Airworthiness

Part 21 Light

- Light Certified process
- Declaration of Design Compliance
- Restricted Certificate of Airworthiness

Aircraft intended primarily for sports and recreational usage
Key principles of the Part 21 Light Concept

→ Authority involvement is reduced, and is made proportionate to the risk
→ Scoping of Part 21 Light is limited to low risk products, primarily intended for sports and recreational use
→ Obligation for an organisational approvals are removed
→ A product focussed approach to oversight aims at having a less bureaucratic system
# A stepped scope of Part 21 Light using risk proportionality

## Lowest risk

**Part 21 Light Subpart C: Declared aircraft**

1. aeroplane with a MTOM of 1200 kg or less with a seating configuration of maximum 2 persons;
2. sailplane or powered sailplane of 1200 kg MTOM or less;
3. balloon designed for maximum 4 persons;
4. hot air airship designed for maximum 4 persons.

## Limited risk

**Part 21 Light Subpart B: Certified aircraft**

1. aeroplane with a MTOM of 2000 kg or less with a seating configuration of maximum 4 persons;
2. sailplane or powered sailplane;
3. balloon;
4. hot air airship designed for more than 4 persons;
5. passenger gas airship designed for maximum 4 persons
6. rotorcraft with a MTOM of 1200 kg or less with a seating configuration of maximum 4 persons.
7. Gyroplanes
8. Piston engines and fixed pitch propeller on (1-7)
Developing a Part 21 Light
Design & Production for Sports & Recreational aviation

Status:
Finalising the focussed consultation of the new concept & draft rule (4th workshop 19/11/2020)
Next step is Advisory Bodies consultation of the draft opinion (2021/Q1)

Following stakeholders request and BR provisions, the Agency is developing these Objective, risk proportionate rules, stimulating entry into the EU market using the “declaration tool” from the BR
Rotorcraft Safety Roadmap Progress (despite COVID impact)

**SAFETY RATING FINANCIAL SUPPORT**
- Introduce an industry led Rotorcraft Safety rating scheme. Schemes studies completed Next – Definition of criteria

**TRAINING TRAINING DEVICES CONTINUED EDUCATION**
- More mandatory & recurrent training. Develop the concept Continued Aviation Education NAA Helicopter Expert Group RMT.0678 NPA publication Creation of RMT.0587 in EPAS
- Awareness & reduction of high-risk training scenarios Helicopter Flight Instructor Guide rev 3 publication
- Modernise the EU pilot training system & devices (advance technologies) R22 VR simulator at EASA RMT.0196 WP3 ToR Published
- Align licensing recurrent requirements with GA RMT.0678 NPA publication
- Encourage development of cheap new training devices for light & medium rotor. R22 VR simulator at EASA for evaluation RMT.0196 WP3 ToR Published

**SAFETY PROMOTION SIMPLIFY**
- Effective communication on safety topics (change behaviours) Rotorcraft Together4Safety Community Website created 1 Poster, 8 videos, 18 articles and over 400,000 views COVID specific communication
- Evaluate & address the unnecessary admin. burden put on operators. Survey published Next: Analysis of outcome and proposed integration in Rulemaking Program

**DESIGN NET SAFETY BENEFITS CS MODERNISATION**
- Crashworthy fuel tanks and seats. All newly produced EU helicopter fully compliant (except one – on-going) Approval of STCs for retrofit of existing fleet Part 26 update on-going
- Develop product safety improvement roadmap All EU products covered One US products covered Covering 80% of the market
- Facilitate the introduction of new technology & identify the systems & equipment providing safety benefits Part21 light, RMT.0712 Proportionality in CS27.1309, CS-STAN update ongoing Cert Memo on Net Safety Benefit drafted
- Project team & industry to modernise CSs Significant activities – ref. EPAS 2020-2025
## Hybrid and electrical VTOL Update 2020

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Hybrid and electrical VTOL

→ COVID Impact on eVTOL
  → Access to resources
  → Number of projects in development still high
  → Funding
    → May become more difficult
    → Will probably limit the number of new projects
    → Will probably induce a consolidation of robust projects
VTOL: major Certification Publications

Published Jan. 2020
SC Hybrid/Electric Propulsion Systems

Published May 2020
eVTOL MoC – Phase 1

Published May. 2020
SC Gyroplane – Road vehicle use

Presented Dec. 2020
1400+ registrations Dec. 9th live
eVTOL MoC – Phase 2

CRD under consolidation
VTOL, - Coming Next

→ Final publication of SC Hybrid and Electrical propulsion and associated CRD
→ Final publication of MoC phase 1 and associated CRD
→ Publication for comment of MoC Phase 2
→ Work on MoC phase 3 for next Symposium
→ Publication of EUROCAE Standards
  → 23 standards publication planned in 2021!
  → Significant Industry and EASA effort
Certification Directorate Update

Background
What were the main drivers?

New Organisation
Present the new Certification organogram

What’s next
Main challenges ahead
CT Adjust purpose

Management of Expert resources  -->  Achieve critical size of expert resources per product line

Synergies  -->  Expand synergies between GA and VTOL

Lean organisational structure  -->  Reduce overhead & Protect technical resources

Policies  -->  Reinforce the management of policy development

Knowledge Management  -->  Develop knowledge management initiatives
Adjusted organisation
Thank you for your attention

Feel free to submit your questions on our live event platform.....
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Design Improvement internal project - Methods


Selected Expertise
- Multidisciplinary team
  - CT Experts
  - FS Experts
  - SM Experts

Organized data for Human Factor/Pilot Awareness and Aircraft Handling

ECCAIRS Squirrel Safety Study

Fishbone diagram
Bowtie diagram
Event Risk Classification

tools

methods
- Desk review
- Collaborative brainstorming
- ALARP

Decision Matrix

Full Analysis Report