

Turning the blades – the new EASA Rotorcraft Roadmap team takes off!

Working in partnership - a success story

The Rotorcraft Roadmap combines safety with a more agile and innovative approach. Following the outstanding example of the GA Roadmap and its team, this common effort of FS, CT and SM has led to another cross-Directorate success story! This background feature outlines the reasons behind the urgent need for changes, the current situation of Europe's helicopter fleets and operations and about safety! It also takes a closer look at the Rotorcraft Roadmap, its short-, mid- and long-term goals, what are the next steps, and what has been achieved so far.

Europe has a strong rotorcraft industry. With more than 7 700 helicopters flying, Europe has the

2nd-largest fleet in the world behind the US. It also has a strong manufacturing industry with Airbus Helicopters and Leonardo Helicopters covering 70% of the worldwide civil market for the 1 ton+ range. Still, the rotorcraft industry continues to be underestimated in Europe compared to fixed wing aeroplanes, the automotive industry, or also railways.

Helicopters are an important part of our daily lives and our society's functioning – they are used for essential activities such as aerial work in mountains, agriculture, offshore, or for emergency operations to save lives.

Rotorcraft in Europe - a strong industry



Airbus AS350



Leonardo AW189

Region of the world (by state of registration)	Number of civil rotorcraft
USA	9,073
EASA Member states	7,762
Asia	5,363
Latin America	4,383
Russia	3,249
Oceania	2,885
Africa	2,446
Canada	2,409
Middle East	1,056
Europe (non-EASA)	954
Central America	511
Grand Total	40,091

With more than 7 700 civil rotorcraft in operation, Europe is number two in the world. The European medium and large civil rotorcraft manufacturing industry is particularly strong, with Airbus Helicopters and Leonardo Helicopters covering 70% of the world market.

The majority of rotorcraft in Europe and also worldwide are smaller helicopters



Europe (Top 5 types)		World (Top 10 types)	
R44	1,033	R44	5,905
H125 / AS350	756	Bell 206	3,399
R22	580	Mi-8	1,733
H135 / EC135	379	H125 / AS350	3,240
Bell 206	352	R22	2,806
		MD500 / Hughes 369	1,075
		Hughes 269	1,163
		Bell 407	1,230
		H135 / EC135	904
		AW109	1,059

Small helicopters represent 70% of the fleet in Europe and also worldwide. The 3 helicopters that are most frequently flown in Europe are the Robinson R44, the Airbus AS350 and the Robinson R22.

Consistent yet worrying numbers of accidents led to action

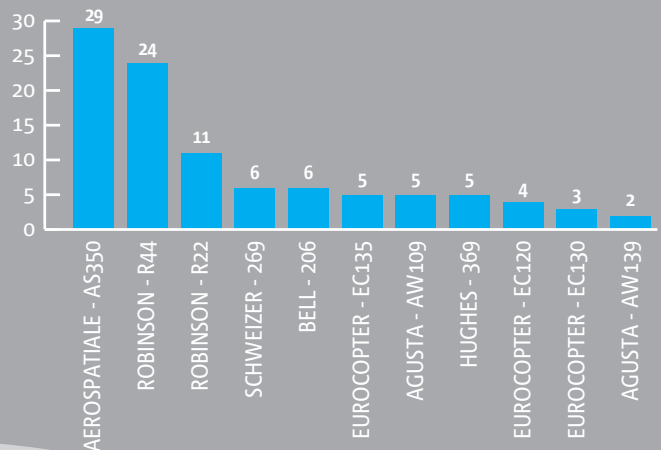
However, when looking at the safety data for helicopters for the past 10 years, it is consistent yet worrying: In Europe, there is on average one fatal rotorcraft accident per month, with about one accident occurring every week. Most of these accidents happen

with smaller helicopters flown by small operators, and are often due to operational causes. Something clearly needed to be done!

The consistently high number of accidents indicated a crisis in industry, the situation was certainly not sustainable and provoked every increasing negative reactions from the public.

Fatal accidents in EASA Member States during 2008 to 07/2019 listed by model: On average one fatal accident per month in Europe

With on average one fatal helicopter accident per month and one accident per week in Europe, helicopter accidents have been consistently high over the past 12 years and showed limited improvement, despite a number of safety initiatives from industry and authorities. Most accidents happen with smaller helicopters by small operators or in private flights. This situation was not sustainable anymore and there has been an urgent need to take action!



Another cross-Directorate success story

We have seen that the main cause of accidents is operational and there is no simple solution. This is why the Rotorcraft Safety Roadmap was initiated as a cross-Directorate project involving experts from Certification, Flight Standards and Safety Management Directorates (see page 13). It was also clear that all these efforts to improve the situation for rotorcraft had to be undertaken together with industry. Under the lead of EASA and on the initiative of Patrick Ky, a small task force was formed together with active representatives of European operators, manufacturers, simulator providers, associations and NAAs (see page 6).

Within a very ambitious time scale between May and November last year, the Task Force developed an ambitious action plan - the

Rotorcraft Safety Roadmap. The team analysed a significant amount of data and took a very close look at the European ‘helicopter landscape’ before establishing its goals, objectives and actions.

The Roadmap’s main objective is to significantly improve the safety of European rotorcraft, with a more specific target of a 50% safety improvement over the next 10 years. Another important goal is to strengthen industry, mainly the small operators, in a sustainable way. Along these main goals, many sub-goals will of course have to be achieved within a much shorter timeframe. These will lead to a significant safety improvement and strengthening of industry. Examples include installation of autopilots in small helicopters, a better safety culture, incentives for new technologies and more.

The EASA Rotorcraft Roadmap – Vision and Strategic Objectives

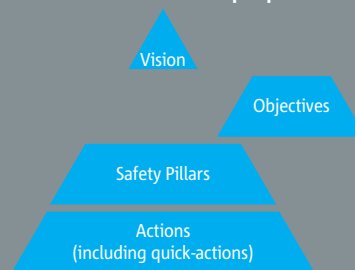
Vision

To achieve a significant safety improvement of European Rotorcraft with a growing and evolving industry



Strategic Objectives:

- Improve overall rotorcraft safety by 50% within the next 10 years
- Make positive and visible changes to the rotorcraft safety trends within the next 5 years
- Develop performance-based and proportionate solutions



Key performance indicators for the strategic objectives of the Rotorcraft Roadmap are the number of rotorcraft accidents in Europe that result in at least a fatality or a serious injury. Additional KPIs are based on the European Risk Classification Scheme (ERCS), complemented by the data collection activity using D4S to build robust accident rates data. Helicopter safety performance indicators are published as part of the EASA Annual Safety Review.

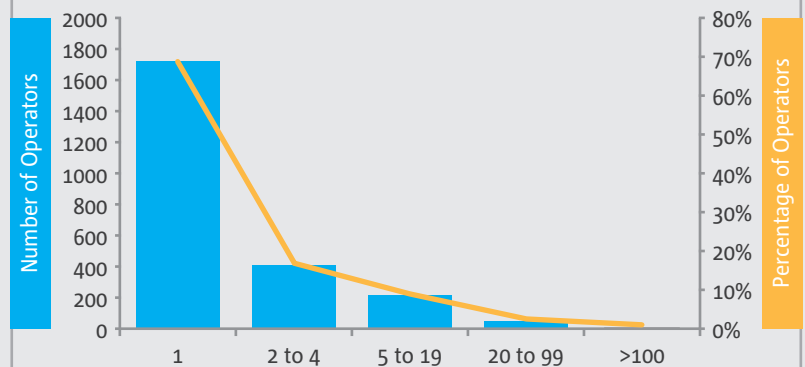
Main groups to target: Light rotorcraft, small operators and General Aviation

When taking a closer look at Europe’s helicopter operators it becomes clear that the vast majority of European operators (about 90%) have a fleet of 5 or less helicopters. Most of the operators only own one aircraft. We are therefore far from the standards of the airline industry. Helicopter operations is a tough day-to-day business trying to earn enough money whilst also keeping their helicopter(s) flying. The majority of these helicopters are lighter rotorcraft such as the Robinson R44, the Airbus A350 and the R22 (see graph).

The main utilisations are leisure flights, special operations such as aerial work in agriculture and mountains, and helicopter emergency medical services and training flights.

As mentioned, it is a fragmented community which is very much concerned with the day-to-day business, similar in many ways to the General Aviation community.

Main target: light conventional rotorcraft and small operators



The data review indicates that the priorities are light rotorcraft (R22/R44, H125/AS350, H135/EC135 and Bell 206) as well as small operators. 90% of European operators have a fleet of 5 or less helicopters.

To get stronger, speak with one voice

In order to make the European helicopter domain more visible and also stronger, regulators, operators, manufacturers, training organisations, pilots etc. needed to work together and speak with one voice. This will also better channel their expertise and energies. In order to come up with a strong action plan and feasible, realistic but also resounding solutions, all partners need to be involved in a relatively small and agile team.

As mentioned above, this team was established with representatives of different kinds of operators, TC holders, training and simulator organisations, associations, NAAs – very similar to the approach that was taken for the GA Roadmap a couple of years ago. Besides the EASA internal team, the participating actors are: Leonardo Helicopters, Airbus Helicopter, EHA (European Helicopter Association), European HEMS and Air ambulance (EHAC), Swiss Air Ambulance (REGA), coptersafety Training school, Helicopter Training and Simulation, Thales group, as well as the National Aviation Authorities FOCA (Switzerland) and TRAFI (Finland).

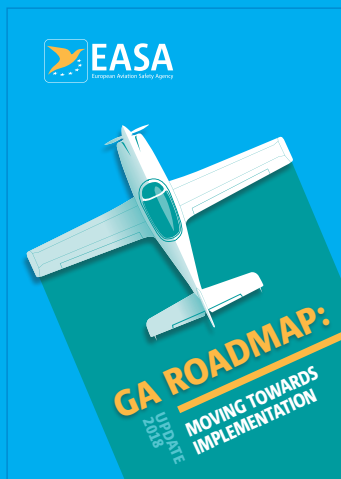


The Helicopter Task Force

From left to right: Nicola Garovi, FOCA; Daniele Romiti, Former CEO of Leonardo Helicopters (Chairman); Matteo Ragazzi, Head of Airworthiness, Leonardo Helicopters; Gilles Bruniaux, Head of Aviation Safety, Airbus Helicopters; Joel Flinois, Product manager, Helicopter Training and Simulation; Stefan Becker, European HEMS and Air ambulance (EHAC); Tim Fauchon, Chairman of the EASA Rotorcraft Committee (Advisory Body); David Solar Head of the VTOL Department, CT.3.

Other Members (not on this picture): Peter Möller, Chairman of the European Helicopter Association (EHA); Mikko Kallio, Head of Development and Test Pilot, coptersafety

EASA team supporting the External team of experts: Clément Audard, Rotorcraft Safety coordinator; Eric Bennett, Senior Expert - Air Operations; John Franklin, Safety Actions Section Manager; Eduard Ciofu, Air Operations Standards Section Manager.



GA Roadmap - Moving towards implementation

Moving Towards Implementation

Practical results of the GA strategy and next steps

You may be aware of the vision and commitments that EASA established a few years ago. They were about better and lighter regulations for General Aviation, something that was urgently needed after the initial regulations imposed too much 'red tape' on the GA community. Well, in the meantime, a lot has happened! Discover in this leaflet the good progress of the GA roadmap activities and learn more about the changes which already have been implemented and those to come. But firstly, let's do a quick recap and look at the fundamentals:

6 GA strategic principles

- Do the job to do it all
- Use rules when it is the only or best way to reach the safety objectives
- Adopt a risk based approach
- Protect what doesn't work well unless there are demonstrable and statistically significant safety reasons against doing so
- Apply the most restrictive principles; and
- Make the best use of available resources and expertise

6 GA key objectives

- Facilitate access to IFR flying
- Allow the training of private pilot outside Approved Training Organisations (ATO concept)
- Simplify and reduce the costs related to the requirements of your aircraft (Part M, Light, Part CAC)
- Allow and promote the introduction of new technology (or the Standard Changes and Repair Process)
- Streamline certification process
- Develop the use of Industry Standards (or CS-2) reorganisation

After developing the GA strategy and GA Roadmap, the past 3 years were already dedicated to action. In the effort to relieve the GA segment of unnecessary regulatory burden, and in taking a proportionate and risk based approach to rules, we can now present a number of tangible results.

EASA

ROTORCRAFT SAFETY ROADMAP

December 2018

Putting all concerned groups within General Aviation around one table and enable an open forum has been crucial for the success of the GA Roadmap. The same principles are now used for the Rotorcraft Roadmap and have already proven to be successful.

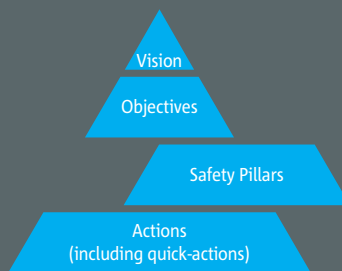
Fostering safety: Better data, market incentives, safety rating and financial support

These are the first four work streams that were identified. The first one is **data** collection and aggregation. We need data to take better informed decisions – without data, no proper decision-making is possible. This activity is central to all the other activities. The rotorcraft team therefore aims to collect more consolidated data such as number of flights and number of flying hours, as well as engage with industry and NAAs. New ways to report data, such as automatic reporting, are

being investigated. We also want to establish a real **rotorcraft safety analysis capacity** at EU level. The Agency’s **D4S (Data for Safety)** collaborative partnership programme is going to be extended to include rotorcraft in the 2nd phase of its deployment (mid 2020) in order to improve our long-term ability to conduct a deeper analysis of the rotorcraft world. That in turn will enable us to better manage safety risks at the European level. The long list of data includes, among others, safety reports (or occurrences), flight data (i.e. data generated by the aircraft via the flight data recorders), surveillance data (air traffic data), and weather data.

The market is the best incentive for better safety!

Safety pillars



Design issues are attributed to 5% of the accident root causes, and a lack of proper maintenance constitute 10% - the biggest issue is training which is why a lot needs to be done there. In addition, the added value of Safety Management Systems (SMS) to ensure safer operation is recognised. We also want to take credit of new technologies such as affordable Stability Augmentation Systems, new autopilots, VR simulators. These simulators are much more affordable compared to the conventional ones and are extremely valuable as they can transfer / alleviate some of the bigger risks, such as high risk training scenarios (i.e. full autorotation training) This is vital for small helicopters, which are even more difficult to pilot yet do not receive any conventional simulator support.

As regards research and innovation we plan to launch initiatives in the area of minimising the effects of single failures such as those relating to gear boxes, as a lot of these single failures are catastrophic; and of allowing accurate IFR¹ operations in new kinds of patterns/ trajectories thanks to modern avionics/ enhanced automation (eg RNP AR² procedures in Swiss Alps).



The market is the best incentive and more efficient in driving the safety aspects compared with a compliance only approach.

¹ IFR: Instrument Flying Rules
² RNP AR: Required Navigation Performance - Authorization Required



Human external cargo on an Airbus AS350 helicopter



Leonardo AW169

“Helicopters are not only flying VIPs to various destinations. In fact, most of the time, they are used to save peoples’ lives or to do important but difficult work. Everybody expects a helicopter to come when there is a big accident, taking seriously injured people immediately to hospital. If we cannot authorise helicopters to fly and if we do not support these important operations, we will fail on these elements that are crucial for our society. This is why EASA wants to engage with the key stakeholders. We want the spokespersons of all stakeholders to speak with one voice and agree on a stream of actions. Some individual things can be promoted individually but when comes to helicopter safety we have to work together. This will be much more powerful!” *David Solar, Head of Department, VTOL (CT.3)*

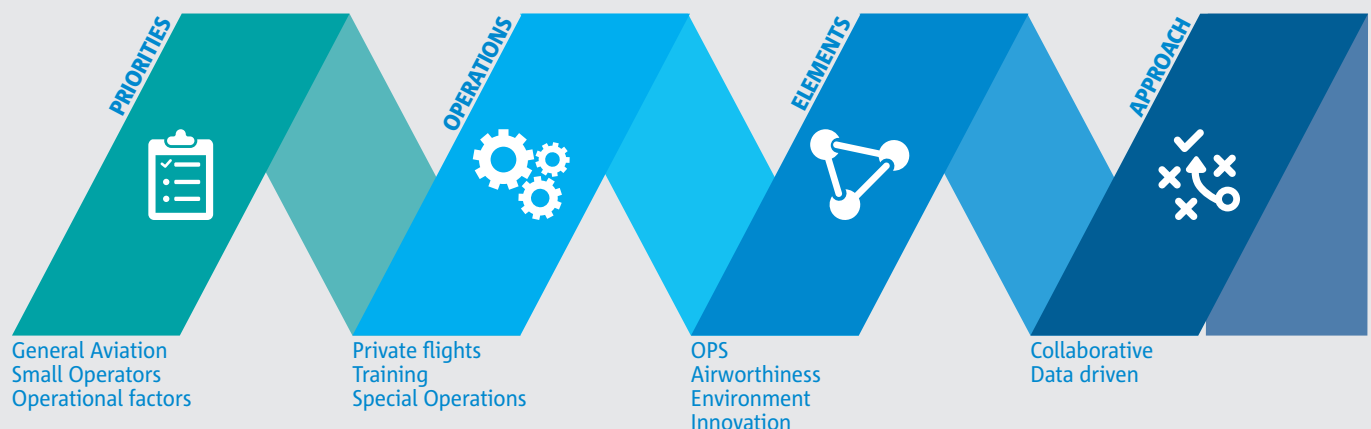
The 2nd work stream is to **incentivise safety**, so that the more equipment or capabilities a helicopter has the more types of operations it will be entitled to do. The next big concept proposed is the introduction of a voluntary **rotorcraft safety rating scheme**. It is being done in the automotive industry with the crash test programmes EuroNCAP. It is a good way to differentiate and give an incentive to the manufacturers to make safety improvements to their vehicles. A comparative review of the current safety rating schemes of different industries has been conducted. It covered a wide range of test programmes used in transport and also, for example, in the food hygiene industry.

It has become clear that the market itself is a stronger driver. All these rating schemes are voluntary but all of

the manufactures are using them. In Europe, it is now almost impossible to sell a new car with less than a 3 star rating. A proposal for a European safety rating scheme for rotorcraft is being developed. It will be a scheme by the industry for the industry promoted and initiated by the Agency.

We want to also identify the key technologies that grant safety benefits. We have started the work with some research bodies and also with some TC-holders to see which key elements could, if introduced, provide significant benefits for the safety of helicopters. This goes hand-in-hand with the **financial support for safety**. Again it should be stressed here that speaking with one voice will create a much better safety case for the European Commission, and will therefore enable funding for helicopter safety.

Roadmap’s components





High-risk training scenarios have to be reviewed for light helicopters such as the Robinson R44. The use of affordable virtual simulators should be promoted for these scenarios.

Training is one of the main issues to be addressed

When looking at the accident rates over the past 10 years, most occur during non-commercial operations such as leisure flights (36%), and a significant number also occur during Special operations (24 %) where critical operations include, for example, aerial work in the agricultural sector and/or with slingloads such as lifting and transporting logs. However, what did come as a surprise were the high numbers of accidents that occur during training.

The main issues that led to these accidents are low flying (obstacles see and avoid), a lack of proper flight planning, and incorrect handling of technical failures. The key risk areas are: upset and terrain collision (for example, inadvertent entry into IMC - instrument meteorological conditions – which stems from bad weather and results in poor visibility). A lower but increasing risk are mid-air collisions: last year there were 3 mid-air collisions between a helicopter and a fixed-wing aeroplane, a risk which is going to increase further if nothing is done to address this issue.

Training is seen both as a risk area, and also as an opportunity. A large number of the in-flight accidents happen during training. A review of the training programme could lead to an increase in the

volume of training provided, whilst also reducing the risks associated with it. For example, training of a full autorotation is provided on a daily basis for less experienced pilots and for those who fly less forgiving rotorcraft, very often with less experienced flight instructors. Some of the lighter rotorcraft have low rotor inertia, which also makes this type of training more risky.

Some training scenarios are known to carry a higher level of risk. It could be argued that the risks taken in training are higher than the actual risks that are faced in operation. A review of the most critical training scenarios should be performed. If the risk of training for a particular failure situation is higher than the risk of suffering that failure in operation, then the frequency of that in-flight training scenario should be reduced, and the training should be conducted instead on suitable qualified training devices.

The use of FSTDs (Flight Simulator Training Devices) and the development of new training devices such as but not limited to Virtual Reality (VR) should be strongly promoted for high-risk training scenarios.

The key message:
Together we can make the changes – it's not the regulator alone, not the operator alone, not the TC holder alone, not the training organisations etc., it is all of us together that can make this big step.

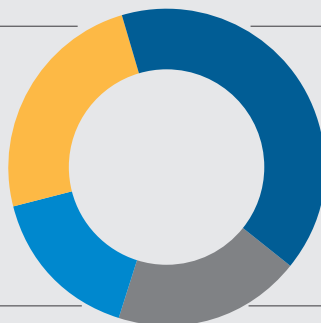
Risk mapping

25%
SPO

Most critical operations:
 • Agricultural and Sling-load

16%
CAT (HEMS, Air Taxi, Offshore)

Key risk areas:
 • Obstacle Collision
 • Helicopter Upset



40%
NCO - Pleasure+Others

Key risk areas:
 • Helicopter Obstacle See and Avoid
 • Intentional Low Flying
 • Flight Planning and Preparation
 • Handling of Technical Failures

19%
NCO - Flight Training

Key risk areas:
 • Helicopter Upset
 • Terrain Collision

*Percentage of accidents per type of operation;
 NCO - Non-Commercial Operations
 CAT - Commercial Air Transport
 HEMS - Helicopter Emergency Medical Services
 SPO - Specialised Operations (such as Aerial Work)*

Better safety awareness and training safety

One of the first things to consider when looking at these accidents is **training safety**. Better training and safety awareness will lead to immediate improvements. This is especially true for the training flights but also all other flights of course. Pilots should receive more and better quality training – we have to focus on the *training* of the pilots, not only on simply checking them. Safety Awareness has to also be made mandatory in recurrent trainings, and not only for the pilots and mechanics but **also for accountable managers**. Key accountable managers need to be aware of training safety – and consider this first in their decisions. How can the risky in-flight training exercises be reduced? What are alternative solutions if the use of a simulator is too costly? A central key subject for better training safety thus are **virtual simulators**, further details are contained in the dedicated text box on page 11.

Review the regulations to ensure better training

The Task Force is considering to introduce a requirement for **Mandatory Safety Awareness** during revalidation of the type rating for the private helicopter pilot licence. Some parts of the pilot community are difficult to reach through safety promotion

actions such as safety events or brochures. EASA and NAAs will actively promote the teaching of Threat and Error Management. First of all, education and assessment of flight instructors should include more training on Threat and Error Management and be mandatory during all phases of flight from planning to execution.

Another important aspect of safety improvement is the **better alignment of licencing requirements** for helicopter pilots with those of fixed-wing GA aircraft. Currently, a fixed-wing small aircraft pilot requires 12 hours of practical flight in the last 12 months to be able to renew his or her licence. A PPL(H) helicopter pilot on the other hand, requires only 2 hours even though it is much more difficult to fly a helicopter compared to a fixed wing aeroplane. This gap is simply too large however we also have to take into account the cost per flight hours for a helicopter.

The current proposal for PPL(H) is therefore to use what exists today in the LAPL (H): 6 hours, 6 take-off, approaches and landings within the last 12 months in addition to refresher training of at least 1 hour with a flight instructor.

The Roadmap also aims to address **recommendations for mission-specific training**. Whilst this is not mandatory today, there is a need for a more standardised approach across Europe.

Training is a number 1 priority!

Where the most safety gains could be achieved!

- Task 1** Training needs identification for light helicopters
- Task 2** Reduce high-risk training scenarios in-flight
- Task 3** Introduce Mandatory Safety Awareness in recurrent training
- Task 4** Review Regulations to promote less checking and more training
- Task 5** Reconsider recurrent training requirements for rotorcraft

At present, a helicopter pilot only needs to fly 2 hours to maintain the validity of his/her licence. Fixed-wing private pilots have to fly 12 hours, conduct 12 take-off and landings and one hour with a Flight instructor within the last 12 months of the validity period or an LPC with an Examiner if the other requirement is not fulfilled.

In the extensive task of improving training by safety promotion as well as by better rules, recommendations from industry and Members States, such as the International Helicopter Safety Foundation (IHSF) and the European Safety Promotion Network Rotorcraft (ESPN-R), have been incorporated into the Rotorcraft Safety Roadmap.



Develop new and more affordable training devices for small helicopters

Today, **affordable simulators** do not exist for light helicopters such as the Robinson R44. However, **Virtual Reality (VR) simulators** will be available soon. They are powerful and promise a bright future for light helicopter training. The cost of this technology is probably a tenth or less of the current simulators. It could increase and massively improve the training of private pilots, with features such as autorotation, hydraulic failure, low G, servo transparency. In addition, they can be used on special operations training scenarios. When looking at our occurrence data we already know which ones are the most **critical scenarios: inadvertent entry into IMC, white-out conditions, loss of tail rotor effectiveness**. These scenarios could be trained much more intensively with the help of virtual simulators and of course at no risk.



Massimo Mazzoletti, SM.2, flying a virtual helicopter at the EASA Rotorcraft Symposium 2018

Currently, **cloud computing** is a technology already available. We can look at a situation where i.e. a private pilot practices with his/her service provider's web devices via the internet. This remote computing saves a lot of money. EASA is working to enable these virtual reality technologies within the given framework.

The objective is thus to encourage and promote the development and use of new types of affordable training devices to better address light and medium helicopters. For now, the focus is on training for private (PPL) licencing, especially when performing high risk training tasks. A study will be conducted as well on the possibility to extend the scope to Operator Specific (OS) tasks for operational training.

Better safety awareness by Continued Aviation Education and Safety Promotion

Currently, there are no requirements for accountable managers and other nominated staff to do any safety training. After they have been nominated they may be in their role for years. But are their capabilities after 10 years still the same as they were in the beginning when they were first nominated? Do the accountable managers have a level of safety awareness that will enable them to take sensible decisions also in the face pressure from the field? This may very well not be the case.

Continued aviation education is therefore another essential point to ensure better safety awareness. It is an all-encompassing educational concept on safety focussed on the lives of pilots/instructors/examiners, of mechanics, but also of accountable managers and other nominated staff.

Using the experience from the continued medical education (CME) concept which was developed within FS.3.1, the Rotorcraft Roadmap Team wants to develop and maintain safety awareness for all staff of

an organisation, and possibly provide credits to those that participate in this continued safety awareness education. A concept for continued aviation education will be presented in December 2019.

In order to establish a sustainable and effective safety culture including the sharing of Best Practices, **Safety Promotion** is a fundamental activity that needs to be further enhanced. Under the lead of the EASA Safety Promotion Team (SM.1.3) and in cooperation with the ESPN-R, a comprehensive **Rotorcraft Safety Promotion Plan** has been developed. It is based on the Roadmap's and European Plan for Aviation Safety (EPAS) priorities, and it is updated every year. As part of the implementation of this plan, we will be using currently available powerful tools such as social media and short videos that could be provided to flying instructors. In this, we will take into account and cooperate with other initiatives - such as the International Helicopter Safety Foundation (IHSF) and the ICAO RASG-EUR Helicopter Operations Safety Team (IE HOST) - to create effective synergies and a much wider distribution network.

Safety Promotion Plan

The safety topics of the plan that have been selected for the next months have been coordinated with the European Safety Promotion Network – Rotorcraft (ESPN-R). They are

- Introduction of the common Safety Promotion activities of EASA and stakeholders
- Coping with Weather
- Flight into IMC Conditions
- Distractions and CFIT (Controlled Flight Into Terrain)
- Avoiding Risk Manoeuvres in Flight
- Safety Tools and Apps

The long term plan includes, amongst others, the following safety topics:

- Preventing Mid-air Collisions
- HEMS Risks
- Hoist Operations
- Passenger Management
- Occurrence Reporting and SMS (Safety Management Systems)
- Benefits of Safety Technology
- Automation and Flight Path Management



Leonardo AW139 in a rescue operation over water

Rotorcraft Safety Promotion Web Portal

The portal is currently being developed within the EASA website. The portal highlights the Rotorcraft Roadmap with a promotional video, the priority operational domains and the most important Key Risk Areas/ Safety Issues.

The portal will also inform visitors about the most important EPAS (European Plan for Aviation Safety) Safety Actions that relate to rotorcraft and how they address the priorities that have been identified.

Information on the relevant rules and regulations related to Rotorcraft Operations will be presented in a more easily understandable way (with links to the official rules themselves).

Increased awareness of occurrences and related information will also play an important role on the site. The results of safety analysis and performance monitoring of helicopter occurrences from the Annual Safety Review will be provided so that they can be easily referenced by the rotorcraft community. Also information on specific accidents and serious incidents will be published on the web portal once the final report has been published.

Finally, the portal will also include Safety Promotion material on specific Rotorcraft Safety Topics arranged in alphabetical format. These will be promoted on social media and professional channels as Monthly Safety Topics.

Simplify – Design – Net Safety Benefit – CS Modernisation - Digitalisation

As regards **simplification** of procedures and rules, industry, operators, service providers, training organisations etc. will need

to provide their feedback to EASA. The task is therefore led by the European Helicopter Association (EHA). EASA is providing support and clarifications upon request. We will launch an ex-ante-evaluation of the administrative burden put on small helicopter operators. This evaluation will be the basis for potential simplification activities.

When it comes to **design**, the Roadmap contains a number of actions that are not visible in the public version of the documents or the presentations. One of several commitments taken with/by Original Equipment Manufacturers (OEMs) was to reduce the number of rotorcraft flying in Europe without crashworthy fuel tanks or also without crashworthy seats. The certification specifications for new designs have been required since 1994. However, today still only around 15 % of the fleet has been equipped with this life saving technology.

Therefore, EASA will develop with each OEM a specific **safety design improvement roadmap for each type** with dedicated deadlines. Our aim is to have no helicopter delivered without crashworthy seats and fuel tanks by 2020. Work is ongoing on the AS350 and a dedicated project team was set up.

We are also developing a **safety continuum concept for rotorcraft**. This is something we want to introduce to enable, for instance, more affordable autopilots to be fitted on small helicopters. Today, the price of an autopilot system is more than the price of an helicopter itself. However, some systems already exist that are affordable and can provide a lot of support to pilots.

This directly leads to the next workstream which is to establish a policy in order to introduce the **net safety benefit concept** in certification. Here we are also going to evaluate technologies which are available. These technologies may not always be fully compliant with the whole set of regulations, but they improve the overall safety of the whole helicopter industry. For the first time, the EASA basic regulation enables a risk-based approach. This activity was initiated in the frame of the GA Roadmap in liaison with the EASA Technology for Safety (T4S) initiative.

Systems that fall under the aspect of net safety benefit:

- Stability Augmentation Systems SAS / basic autopilots / cable cutters/ Wire Strike Protection Systems (WSPSs) / Helicopter Terrain Awareness and Warning Systems (HTAWS) / obstacle data bases updates;
- Connectivity (i.e. access to open-world data such as weather or other real-time data during flight) to improve flight safety;
- Synthetic Vision Systems (SVS), Head Up (including head mounted displays) or Head Down Displays for situational awareness with regards to terrain and obstacles;
- Laser radar or other technologies for obstacle and terrain avoidance systems (Proximity Warning Systems);
- Miniature Cockpit Voice and Flight Data Recorders (CVFDRs); Full Authority Digital Engine Controllers (FADECs); Helicopter Flight Data Monitoring Programme (HFDM) systems including light helicopters.

Last but not least, this workstream will also address the **modernisation of the EASA Certification Specifications** for helicopters. A number of RMT (rulemaking tasks) have been initiated and are now delivering. EASA's rotorcraft team is engaged with industry and the other bilateral partner authorities on the modernisation of the CS. The goal is to establish a plan towards more performance- and objective-based Certification Specifications that provide greater flexibility and facilitate innovation.

What about the European approach worldwide?

Colleagues from International Cooperation are supporting the promotion of the Roadmap worldwide. As an example, within the scope of ongoing international cooperation projects, the Rotorcraft Safety Roadmap has already been presented in Kathmandu/Nepal and is planned in Ukraine. EASA has also partnered with Airbus Helicopter to set up a Safety Roadshow in South East Asia with 23 events already organised. This is complementing Airbus Helicopter worldwide Safety Promotion roadshow to introduce the roadmap. In 2019, Airbus Helicopters has planned more than 140 events with Operators.

- Further develop and finalise key rotorcraft roadmap concepts
- Define detailed implementation plans for each stream – link with EPAS
- Prioritise rotorcraft proposals
- Leverage existing Rulemaking tasks as much as possible
- Commitment on resources from all stakeholders
- Keep the dialogue open and transparent within the Rotorcraft Community
- Engage EU Policy makers to link the rotorcraft roadmap within EU Global Transportation Plan

What's next?



THE TEAM



The Rotorcraft Safety Roadmap Team is led by (from right) David Solar (Project Leader) and Clément Audard (Project Manager).

Rotorcraft Safety Roadmap Team

- from left: **David Solar**, Rotorcraft Safety Roadmap Project Leader and Head of Department - VTOL, CT.3; **Clément Audard**, Rotorcraft Safety Roadmap Project Manager and Safety Coordinator - VTOL, CT.3; **Eric Bennett**, Senior Expert - Air Operations, FS.2.1; **Hans Birkholm**, Flight Crew Training ATO Expert, FS.3.2; **Daan Dousi**, Aircrew & Medical Standards & Implementation Section Manager, FS.3.1; **Carl Garvie**, Regulations Officer - Initial Airworthiness, CT.5.1; **Roel Huysmans**, Senior Expert – OSD Flight Crew, FS.3.2; **Colin Langley**, Senior Expert - Aircraft Maintenance, FS.1.2; **Michel Masson**, Senior Safety Promotion Officer, SM.1.3; **Pietro Piliero**, PCM - VTOL, CT.3.2; **Hamdy Sallam**, Flight Test Pilot - Rotary Wing, CT.3.3; **Florent Morel**, Junior Safety Analysis Officer, SM.1.1; **Mattia Capomagi**, Trainee, CT.3

