



Dedicated to innovation in aerospace

Adopting technologies to mitigate helicopter accident factors –the way forward of ESPN-R ST Technology

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ESPN-R SAFETY WORKSHOP at HELITECH – 17 Oct 2018

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Introduction

- Helicopter accident rate considered (too) high



International Helicopter Safety Team (IHST) launched in 2005 aiming to reduce worldwide accident rate

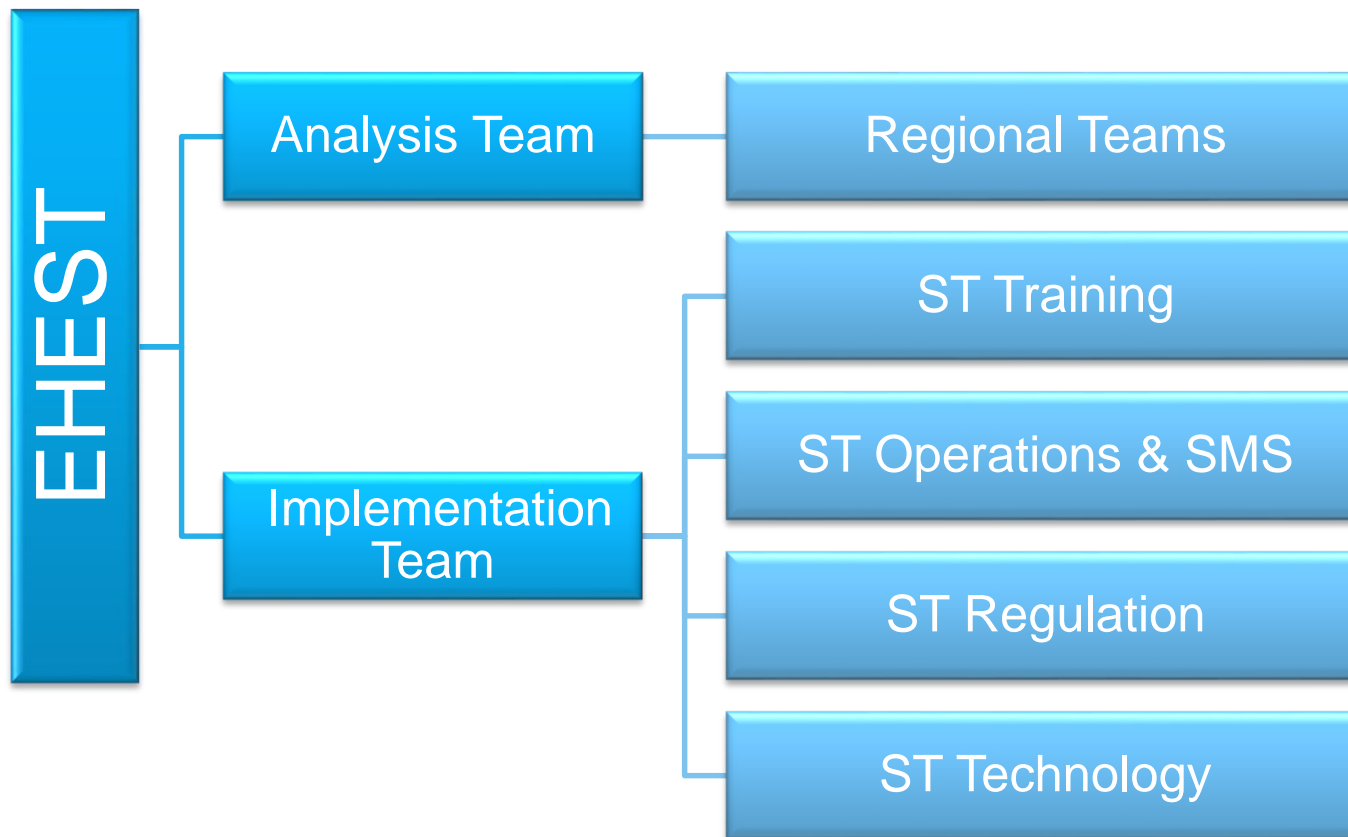


European Helicopter Safety Team (EHEST) launched in 2006 to contribute to this initiative



European Safety Promotion Network Rotorcraft (ESPN-R) launched in 2017 (follow-up to EHEST)

Former EHEST organisation



Current organisation

Stakeholder Advisory Body (SAB)

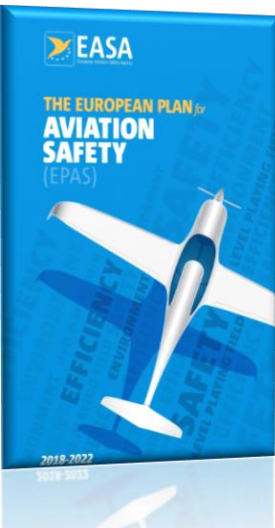
Rotorcraft Committee (R.COM)

European Safety Promotion Network –Rotorcraft (ESPN-R)

ST-Training

ST-OPS & SMS

ST-Technology



EPAS identifies

Rulemaking Tasks (RMT)

Research Needs (RES)

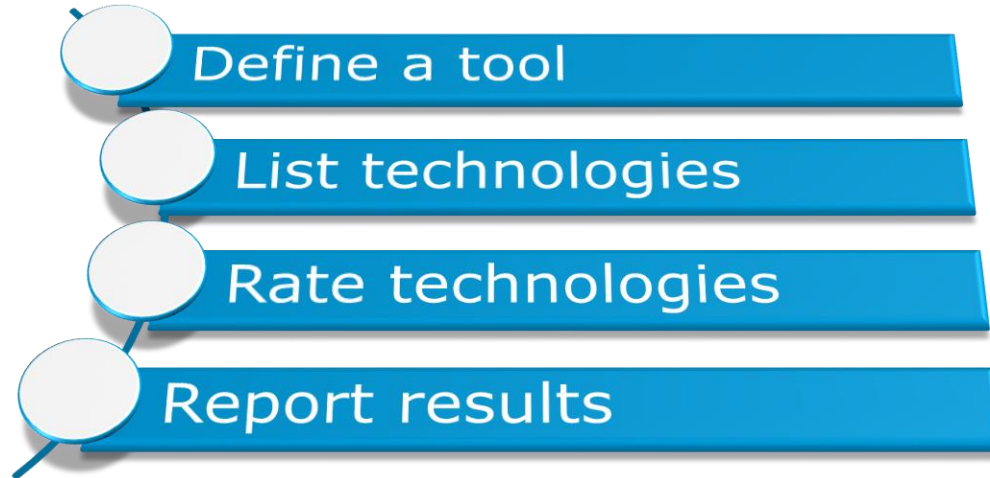
Safety Promotion Tasks (SPT)

- ...
- SPT.095 Promote helicopter technologies with safety benefits
- SPT.096 Organise an annual safety workshop at Helitech Int.



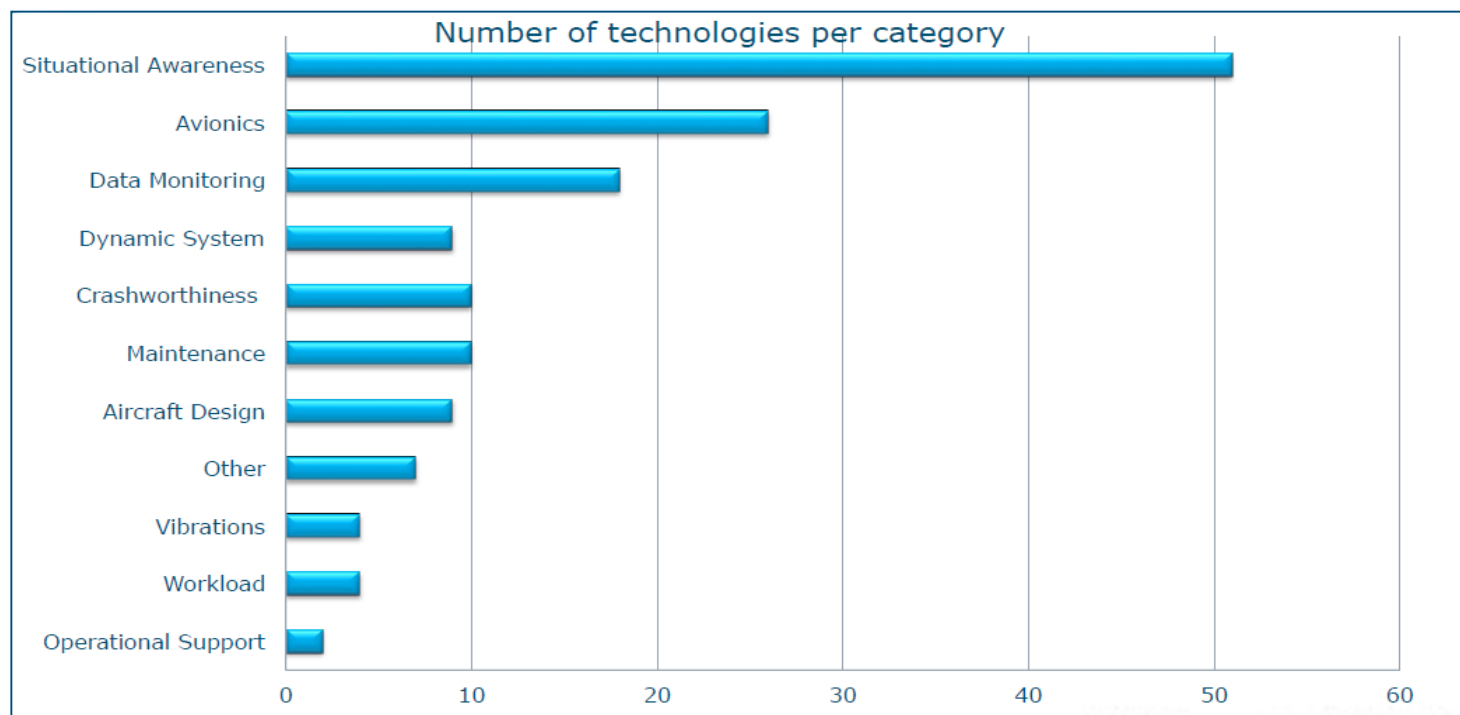
Specialist Team Technology

- Created in 2011 to
 - Link analysis results to R&D and technological developments
 - Assess potential of technologies to mitigate safety issues
 - Range of team members with various expertise and backgrounds



Listed technologies

- Total of 145 technologies in 11 categories



Overall study results

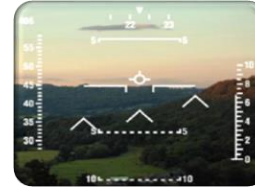
Technologies vs. safety issues

**15 Highly
promising**

**50 Moderately
promising**

**28 Not / Slightly
promising**

**5 technologies highly
promising for 3 or
more safety issues**



Digital range image
for flight guidance



EGPWS / TAWS



Laser/Radar Obstacle and
terrain avoidance system



Digital moving map



(Deployable) Voice and
Flight Data Recorder

Example technologies

Results useable in three ways

Which technology (best) addresses a specific safety issue

- Technology with highest ratings

Where to expect safety benefits from (new) technology

- Rating new technology (aimed at specific problem) may reveal it also can mitigate other safety issues

Which safety issues are not (sufficiently) addressed by technology

- Safety issues lacking (sufficiently promising) technological solutions stand out

Challenges

Translate results in concrete technology implementation

- Disseminate to helicopter community and beyond
- Use results to improve safety by adopting technologies
- Actions for industry, regulators, research institutes, universities, ...

Continue activities, because

- Current technologies evolve
- New technologies emerge
- Safety issues (= accident causes) change
- New (safety) initiatives develop

Current technologies evolve

Technologies progressed towards higher TRL

Some already found wide-spread use, like

- Tablet-based digital maps
- Passive (ground-based) obstacle collision avoidance system
- Full authority digital engine control

Others found additional usage on smaller helicopters, like

- Terrain awareness and warning system
- Obstacle detection
- Miniature voice and flight data recorder
- Wire strike protection system
- Radar altimeter

New technologies emerge

Not included in earlier study, e.g. due to low TRL

New developments brought to market recently, like

- Collective pull down
- Emergency breathing devices
- Automatic emergency seat belt release
- Emergency exit training device
- High-speed data communication via satellite
- Autonomous guidance and landing system

Possible spin-off from cars or drones, like

- Obstacle detection
- Automated driving/flying



Safety issues change

New safety issues
from EASA Annual
Safety Review



**ANNUAL
SAFETY
REVIEW
2018**



Four types of operations

- Commercial Air Transport (CAT) – Offshore
- Commercial Air Transport (CAT) – Other
- Specialised Operations (SPO)
- Non-Commercial Operations (NCO)

Safety issues classified in

- Aircraft upset
- Obstacle collision (in flight)
- Terrain collision

Safety issues change -continued-

Aircraft Upset

- Software and Configuration
- Systems Failures
- Flight Path Management
- Perception and Situational Awareness
- Experience, Training and Competence of individuals
- Handling of Technical Failures
- System reliability
- Knowledge of Aircraft Systems and Procedures

Safety issues change -continued-

Obstacle Collision (in-flight)

- CRM and Configuration
- Software and Configuration
- Flight Planning and Preparations
- Wrong Deck Landings
- Helideck Operations
- Helicopter Obstacle See and Avoid
- Perception and Situational Awareness
- Intentional Low Flying
- Degraded Visual Environment
- Navigation and Airspace Knowledge
- Landing Site Operations

Safety issues change -continued-

Terrain Collision

- Perception and Situational Awareness
- Helicopter Obstacle See and Avoid
- Decision Making and Planning
- Experience, Training and Competence of Individuals
- Degraded Visual Environment
- Navigation and Airspace Knowledge

New initiatives develop



HeliOffshore
Safety Through Collaboration

HeliOffshore

- Safety-focused association for offshore helicopter industry



European HEMS & Air Ambulance Committee (EHAC)

- Trade association for European EMS organisations



Helicopter Association International (HAI)

- Trade association for international helicopter community



EASA European Plan for Aviation Safety (EPAS)

- Rule making, research actions, safety promotion



Network for Innovative Training on Rotorcraft Safety (NITROS)

- Training PhD students

Conclusions

Top 15 highly promising technologies identified in 2014 jointly can mitigate 11 of top 20 safety issues

Since then technologies progressed towards higher TRL and towards application on smaller helicopters

Continue activities

- Assess whether specific technologies used in Offshore operations can be adopted in other operations
- Identify for which (other) safety issues the application of technologies might be useful
- Develop proactive approach to enable early focus on safety benefiting technologies, for current and future operations

Ultimate goal

Safety is first priority! (this depends on all of us)



‘Target Zero’

- Zero (fatal) accidents
- Zero injuries to people
- Zero harm to environment
- Zero



Dedicated to innovation in aerospace

Fully engaged

Netherlands Aerospace Centre

Questions?



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