



EUROPEAN AVIATION SAFETY AGENCY
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT



The future of Rotary Wing

CESMA Seminar

Roma, CASD, 22 November 2012

How could developing and future technologies mitigate helicopter safety issues? The European Helicopter Safety Team's (EHEST) approach.

Presented by V. Pennetta, EASA

Developed by M. Masson, EASA, J. Stevens and J. Vreeckens, NLR

Your safety is our mission.
easa.europa.eu

- **Brief introduction on EASA**
- European Helicopter Safety Team
- Safety issues identified by EHEST
- Safety benefits of technologies

The EASA in Köln, Germany

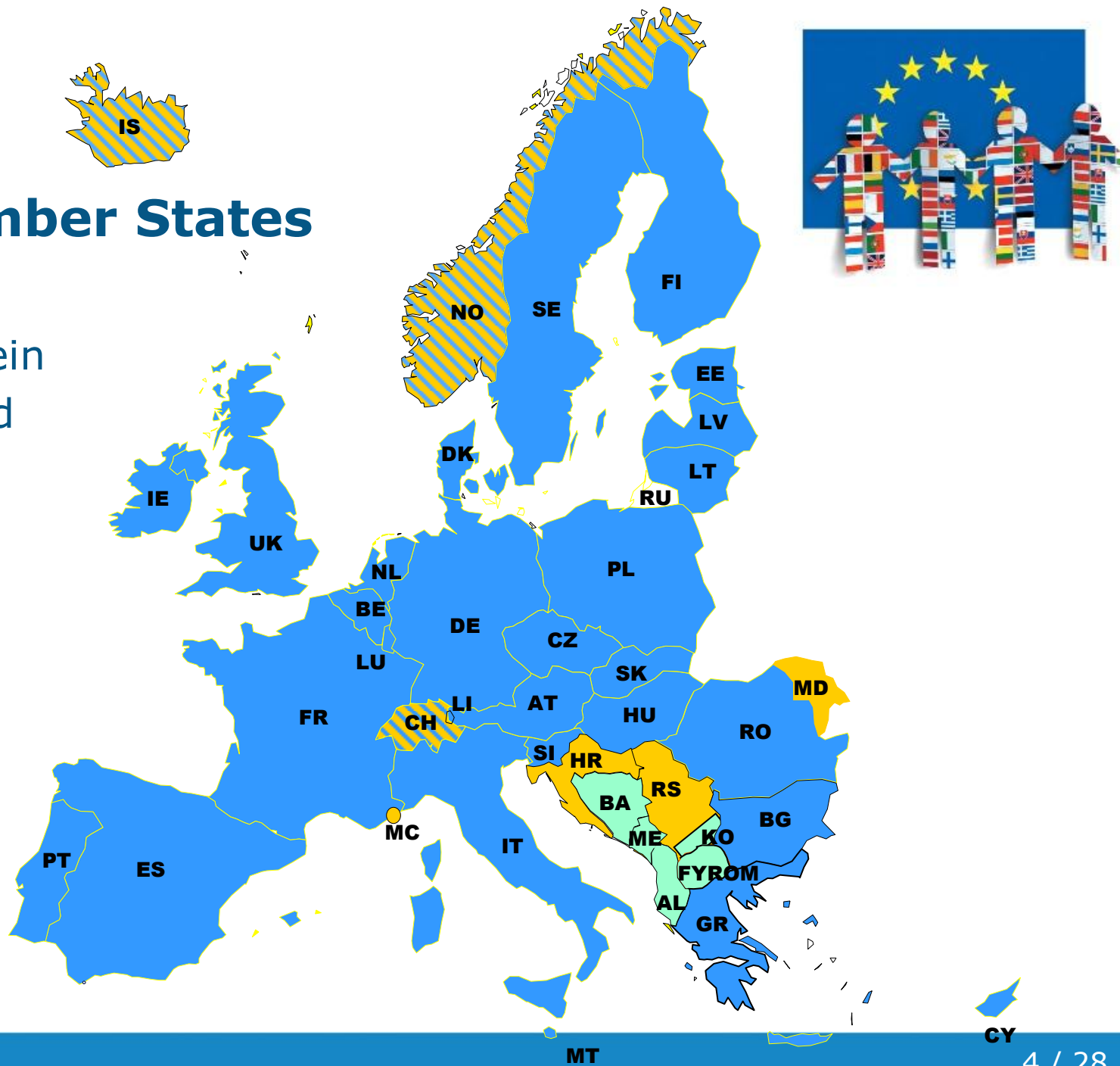
- **Operational since September 2003**
- **Offices in Köln, Germany, since Nov.2004**
- **Independent legal status**
- **Nearly 600 employees**



EASA Member States

EU 27 +

- Liechtenstein
- Switzerland
- Norway
- Island



➤ Main objective:

Establish and maintain a high uniform level of civil aviation safety in Europe.

- ▶ Develops common safety and environmental rules at EU level (CS-23, CS-25, ...);
 - ▶ Release the Type Certificate for aircraft, engine, propeller;
- ▶ Monitors implementation of standards through inspections of the MS
 - ▶ Provides also the necessary expertise, training and research;
- ▶ Works with national aviation authorities (operational tasks, e.g. certification of operators, flight crew licensing)



EASA non-binding regulatory material

CS

Technical standards to be used in the certification / approval process

“Building blocks” for the certification basis

AMC

Technical / procedural material

One means to comply with the rule – but not the only one

Presumption of compliance

GM

Interpretative / explanatory material

Provides guidance on how the rules should be understood

The sharing of roles in EU – Aviation Safety

Legislative Role  Commission, assisted by EASA

Executive Role  NAA, assisted by EASA

Monitoring Role  Commission, assisted by EASA

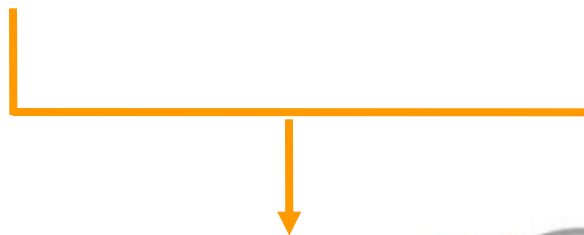


 or directly EASA, *when the legislator decides this is more convenient for the whole EU system*

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EHEST, a Safety Partnership





EHEST Composition and Governance

- More than 75 organisations
- Co-chaired by representatives from EASA, EHOC and Eurocopter

FLIGHT SAFETY

Looking back at 2009, we can see more activities to increase flight safety than in all the years before. We see the EHEST EASA team with Michael Masson in the forefront, but also Matt Zuccaro, president of HAI, who has been one of the most outspoken advocates of flight safety. But there have been so many meetings, workshops, conclusions, letters of intent etc., that we all need more orientation to see through it all. With the help of EASA, 4ROTORS will start to shed more light on it and facilitate that orientation.

A Year For Flight Safety

Update on the Progress of the Major European Helicopter Safety Partnership

What has the European Helicopter Safety Team achieved after three years of operation? This article describes the initiative's organisation, mentions its links to the European Strategic Safety Initiative (ESSI) and the International Helicopter Safety Team (IHST), and introduces the various EHEST teams and sub-teams. It also reports on main achievements and unveils plans for 2010-2012. Ready to take off?

The European Helicopter Safety Team (EHEST)

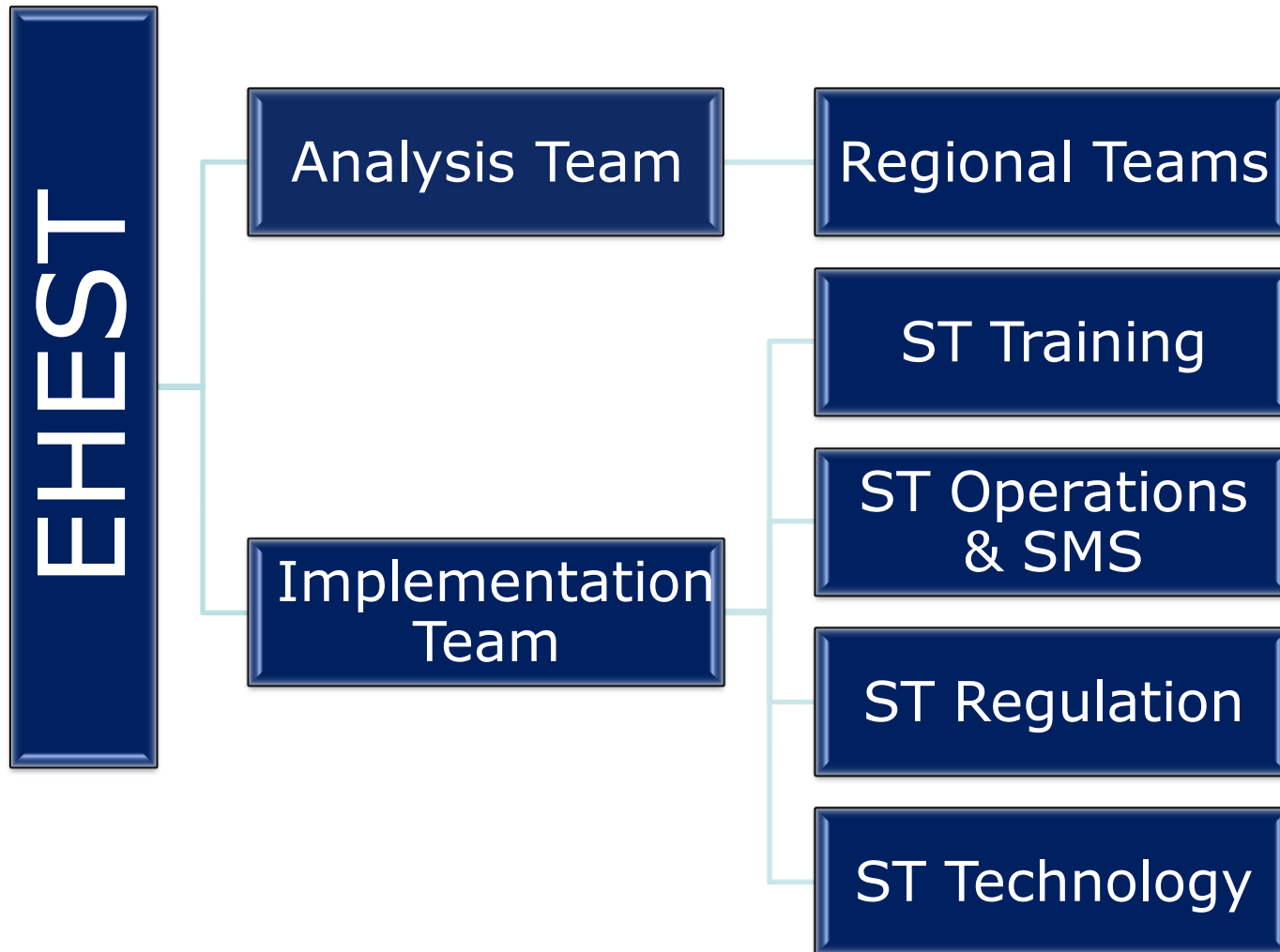
EHEST took off in 2006 as the helicopter component of

community. Currently, more than 150 organisations participate. The basic principle is to improve aviation safety by complementing regulatory action by voluntarily committing to cost-effective safety enhancements. Analysis of occurrence data, coordination with other safety initiatives and implementation of cost-effective action plans are carried out to achieve fixed safety objectives. The ESSI has three components: the European Commercial Aviation Safety Team (ECAST), the European General Aviation Safety Team (EGAST), and the European Helicopter Safety Team (EHEST). ECAST is co-chaired by EASA and IATA, EGAST by EASA and ECOGAS and EAC, and EHEST by EASA, Eurocopter, and EHOC. Progress of the initiative is reported on a yearly basis in the EASA Annual Safety Review and in various publications, articles, and presentations in International Conferences.

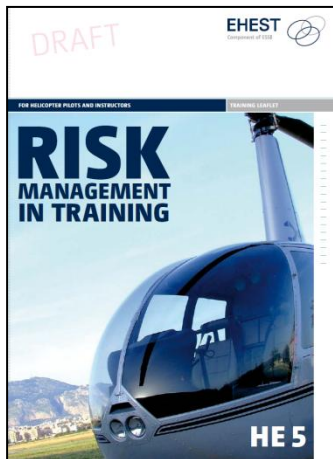
The International Helicopter Safety Team (IHST)

EHEST is also the European branch of the International Helicopter Safety Team (IHST). IHST was formed as a major initiative to improve helicopter safety worldwide.

4Rotors



EHEST safety products



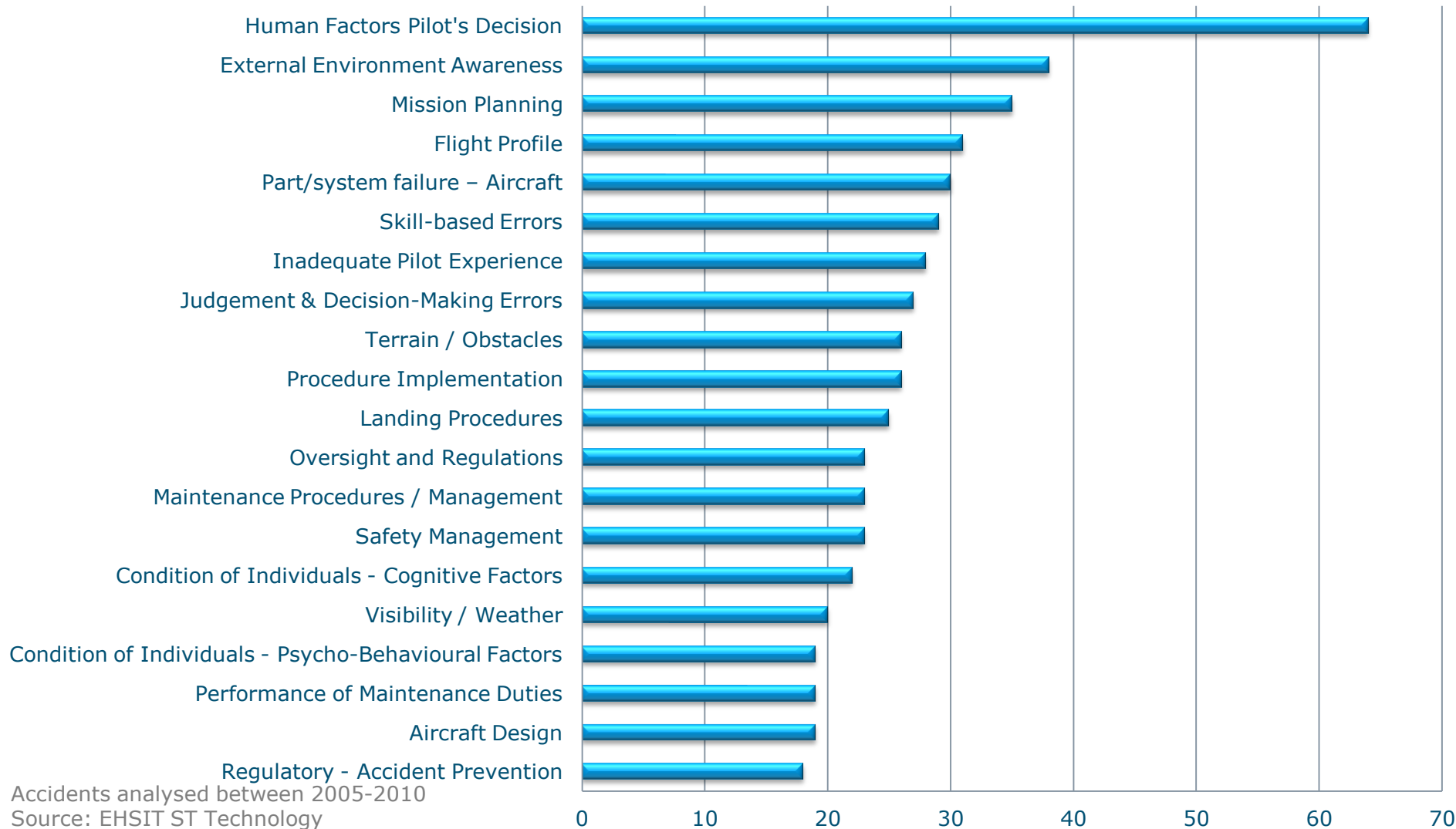


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- European Helicopter Safety Team
- **Safety issues identified by EHEST**
- Safety benefits of technologies



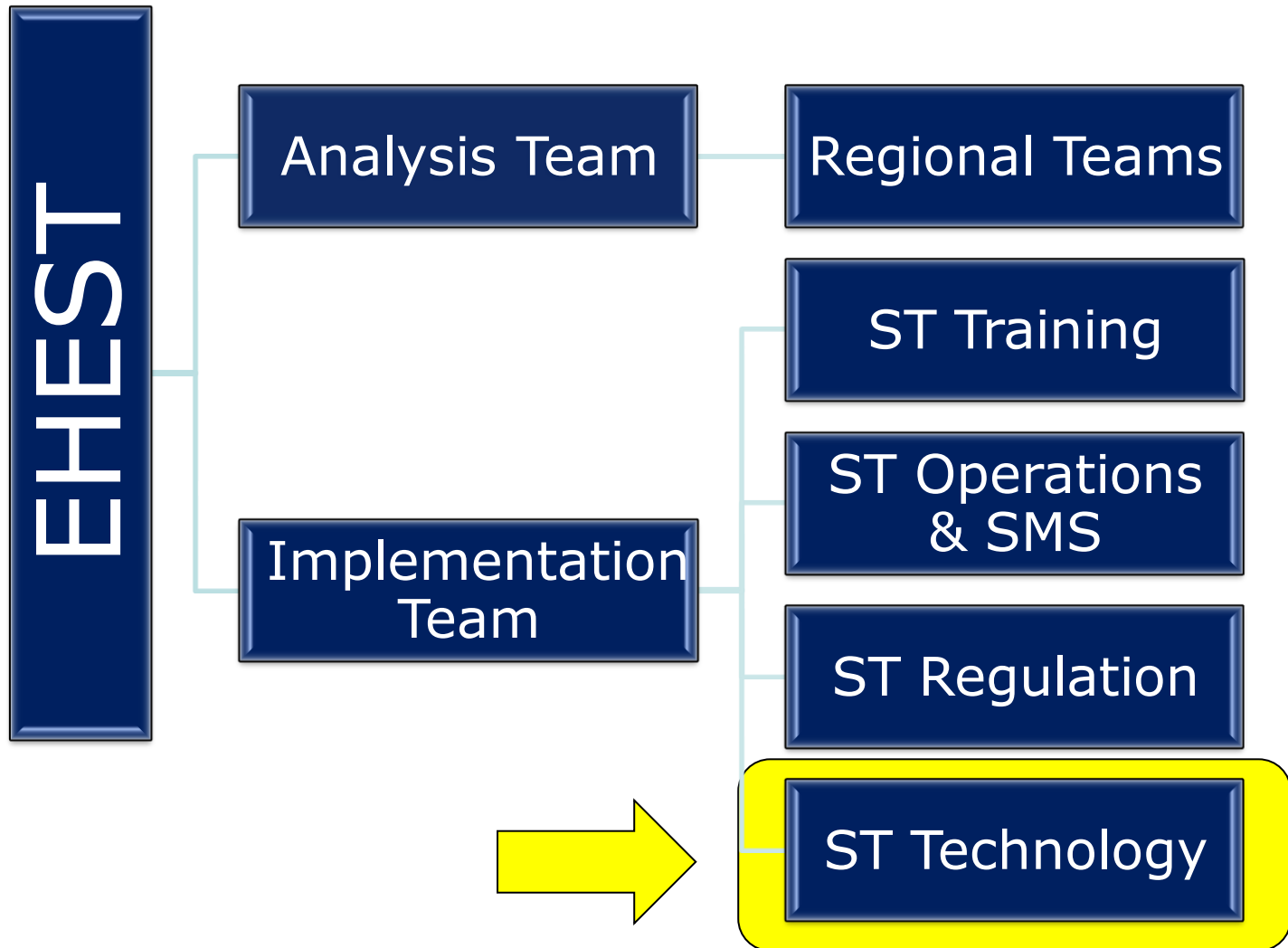
What are the safety issues (SPS)?



Accidents analysed between 2005-2010

Source: EHSIT ST Technology

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- **Safety benefits of technologies**





ST Technology: team composition

- NLR, Lead
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- EASA
- Eurocopter
- AgustaWestland
- Rockwell Collins
- Cranfield University
- DLR
- ONERA
- Thales
- Christophorus Flugrettung



ST Technology: Tasks

Assess the potential of technologies to mitigate safety issues

Define an approach and a tool

List technologies

Rate technologies

Disseminate results

Provide continuous updates



Define an approach and a tool

Safety Issues

Technologies

Import Technology		AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	Aircraft Design (level 2)
Technology SPS/CICT--		Unsafe Acts Errors	Safety Management	Regulatory	Preconditions Condition of Individuals	Pilot situation awareness					Part / system failure	Mission Risk	Maintenance	Ground Duties	Aircraft Design					
		Skill-based Errors	Judgement & Decision-Making Errors	Inadequate Pilot Experience Management	Oversight and Regulations (Regulatory)	Accident Prevention	Cognitive Factors	Psycho-Behavioural Factors	External Environment Awareness	Visibility/Weather	Human Factors - Pilot's Decision	Flight Profile	Procedure Implementation	Landing Procedures	Part/system failure - Aircraft	Terrain/Obstacles	MX Procedures/Management	Performance of MX Duties	Mission Planning	
3																				
4	Data monitoring																			
6	goto Flight data evaluation and processing for accident incident investigation	0	0	0	0	0	8	0	0	0	0	0	0	0	6	0	6	6	0	0
7	goto Deployable Voice and Flight Data Recorder	0	0	0	0	0	7	0	0	0	0	0	0	0	6	0	6	6	0	0
8	goto Miniature Voice and Flight Data Recorder	0	0	0	0	0	6	0	0	0	0	0	0	0	6	0	6	6	0	0
9	goto TRIADE project	0	0	0	0	0	5	0	0	0	0	0	0	0	6	0	6	6	0	0
10	goto Cockpit Information Recorder	0	0	0	0	0	6	0	0	0	0	0	0	0	6	0	6	6	0	0
11	goto Flight Data Acquisition and Flight Data Monitoring	0	0	0	0	0	6	0	0	0	0	0	0	0	6	0	6	6	0	0
12	goto Full Authority Digital Engine Control	7	5	0	0	0	5	0	0	0	0	0	0	0	6	0	6	6	0	0
13	goto VIBRATION PASSPORT TECHNOLOGY FOR CONDITION MONITORING OF HELICOPTER ENGINES	0	0	0	0	0	4	0	0	0	0	0	0	0	6	0	6	6	0	0
14	goto Light helicopter HOMP systems	0	0	0	0	0	6	0	0	0	0	0	0	0	6	0	6	6	0	0
15																				
16	Situational Awareness																			
17	goto ALLFlight- Fusing sensor information to increase helicopter pilot's situational awareness	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	6	0	0
18	goto Enhanced Ground Proximity Warning System / Terrain Awareness and Warning System	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6	6	0	0
19	Active laserbased obstacle and terrain avoidance system combined with passive data base system (CDWS)	0	7	0	0	0	0	0	0	0	0	0	0	0	7	0	7	7	0	0
20	User description Technologies - Safety Matrix																			
21	Technology database																			

Present, developing and future technologies





Example of technologies assessed



Sensor based obstacle and terrain avoidance

(Cassidian)



Predictive ground collision avoidance

(Goodrich)



Deployable System for Crash-Load Attenuation (NASA Langley Research Center)



Coated rotor blades to prevent erosion

(Kaman a.o.)



Seat Dynamics for Aircrew Vibration Mitigation

(National Research Council Canada)



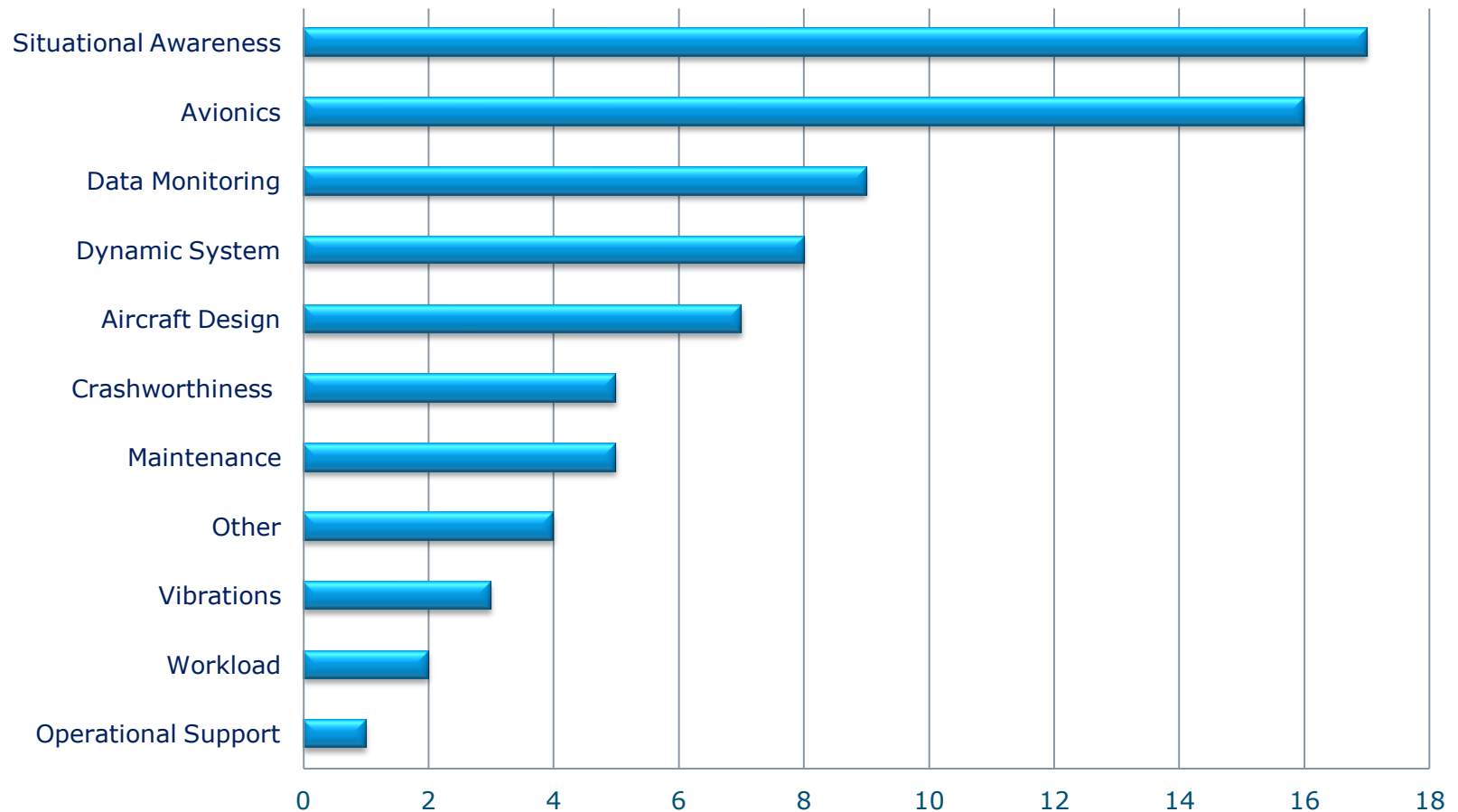
Autorotation training display

(Systems Technology Inc)



Categories of technologies assessed

Number of technologies per categories



Rating process

Sub-team A

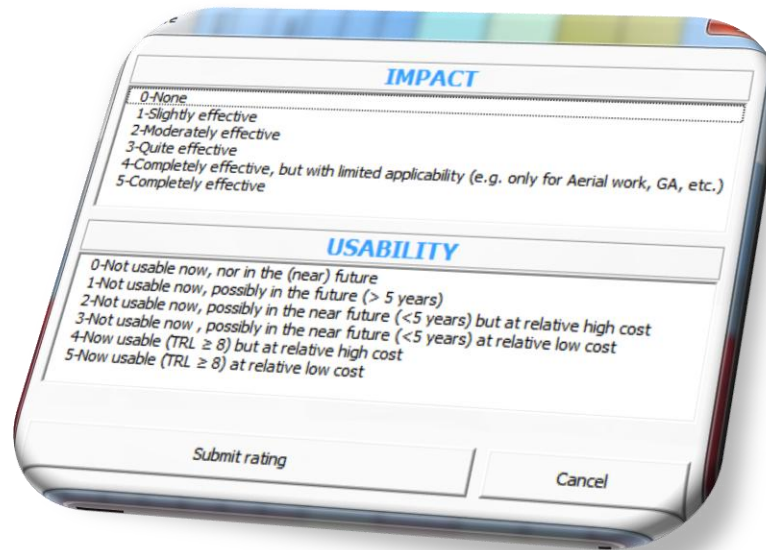
Set of technologies

Sub-team B

Set of technologies

Sub-team C

Set of technologies



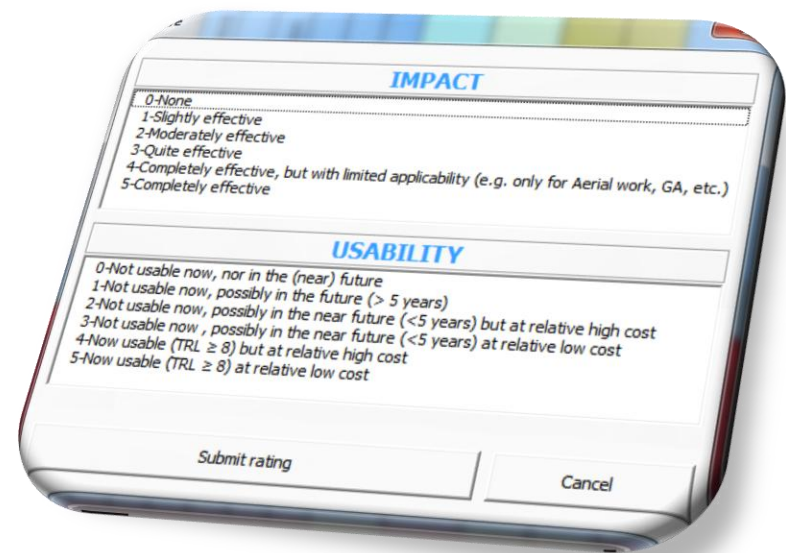
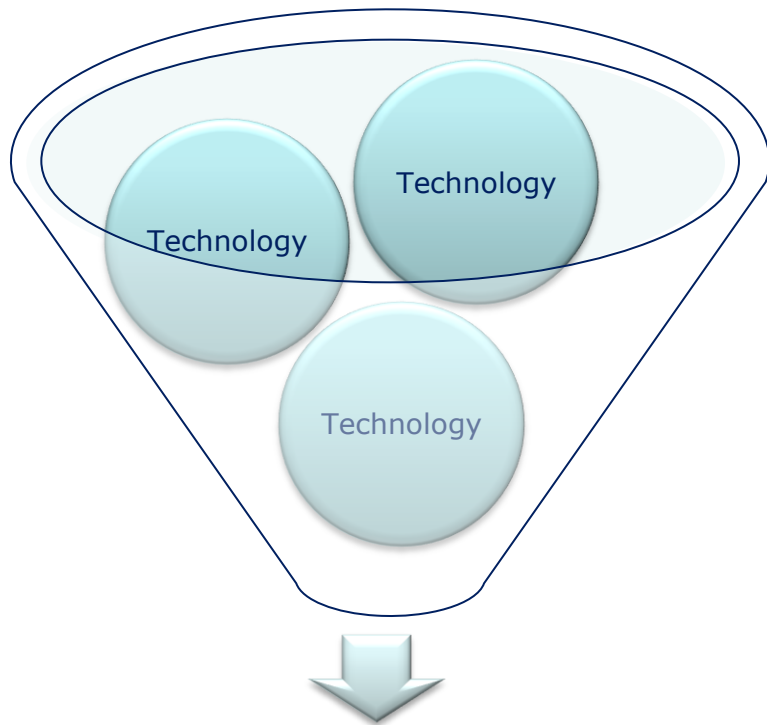
Highly
promising

Moderately
promising

Not / Slightly promising



Way forward



Technology Database + Identification of Technology Needs



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Thank you for your attention.



Your safety is our mission.

