



The European Helicopter Safety Team

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1. SETTING THE SCENE

2. METHODOLOGY

3. INTERIM RESULTS

4. CONCLUDING REMARKS

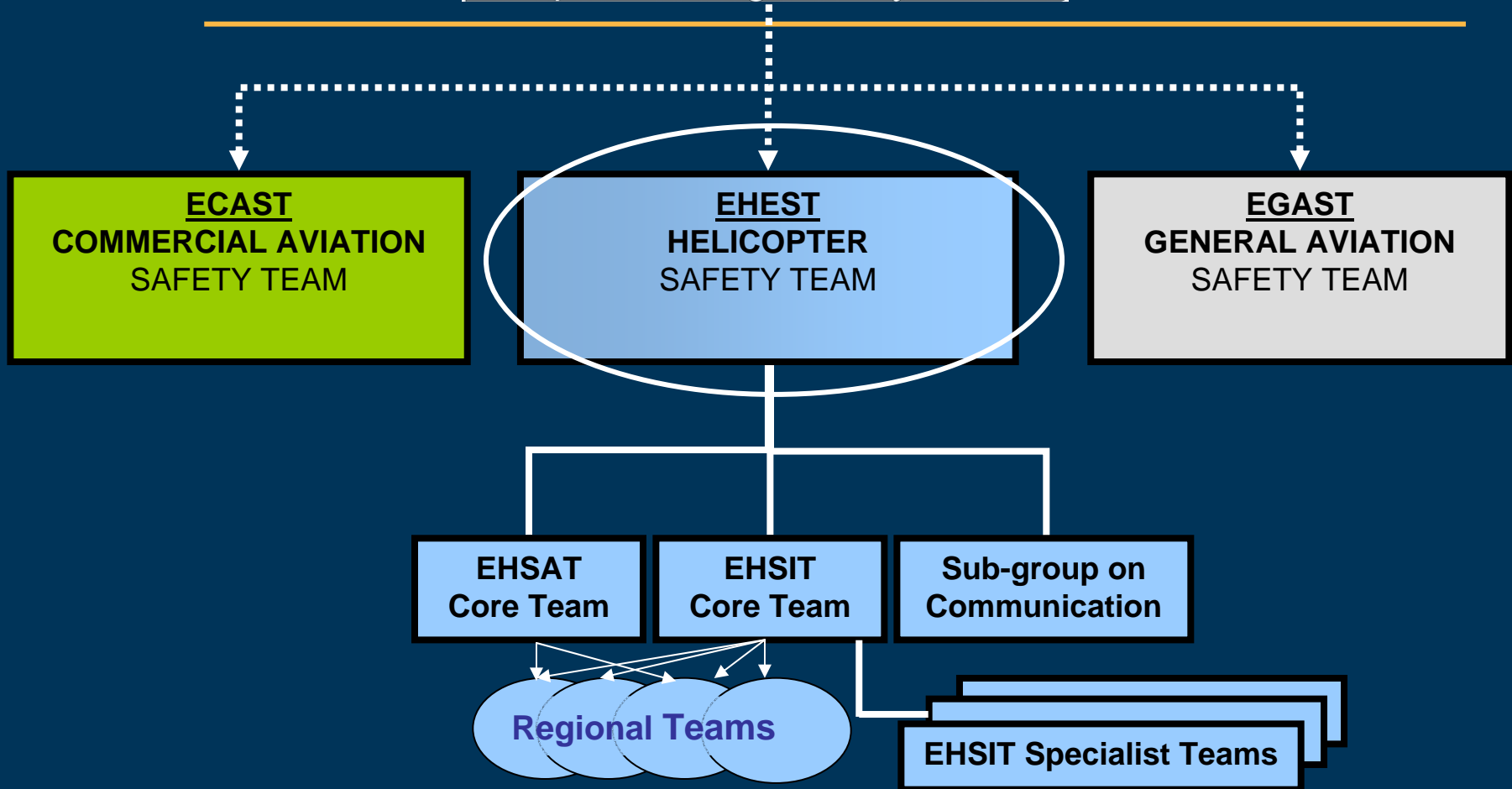


Flight Safety Initiatives

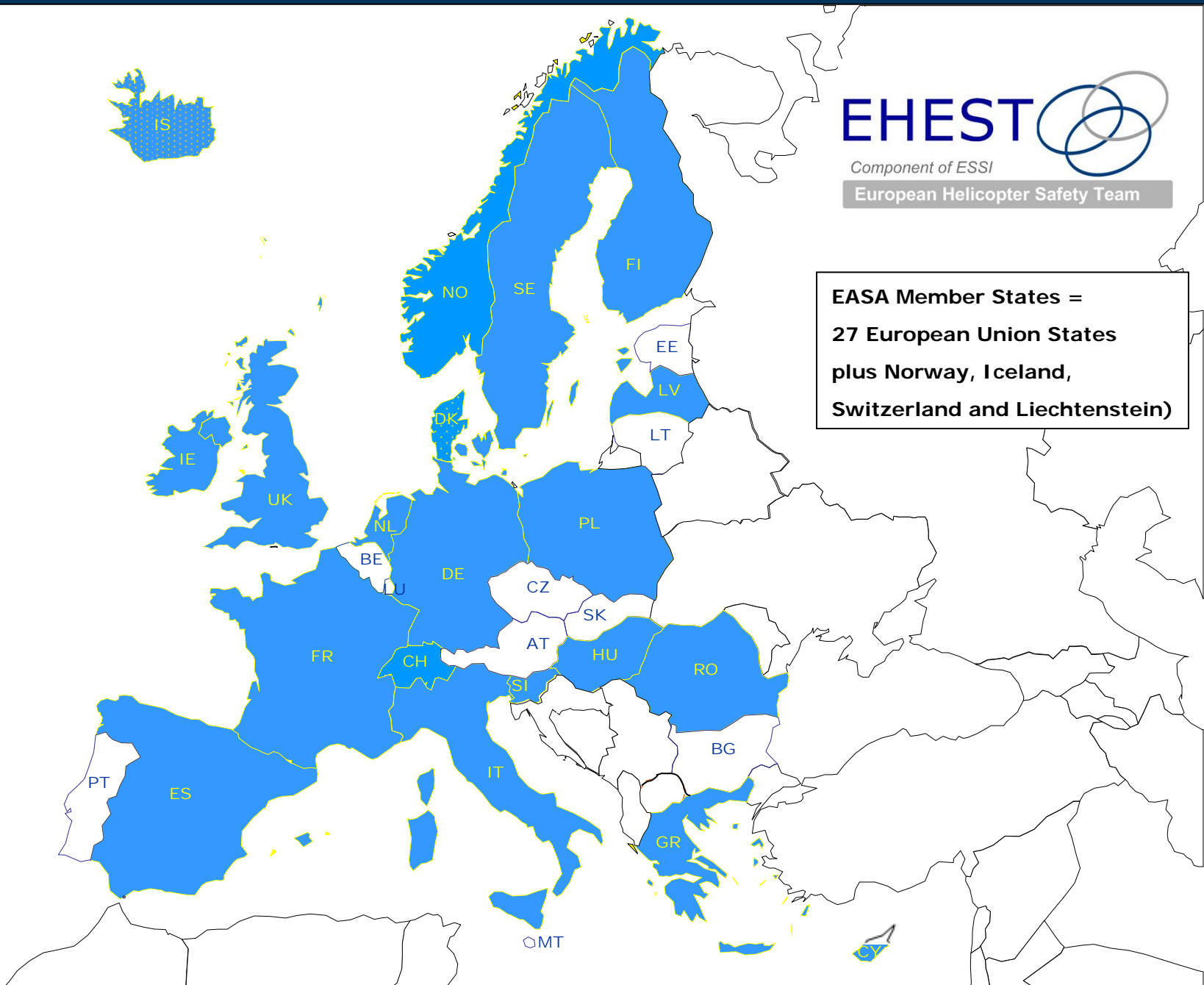




EHEST is the helicopter component of ESSI
and the European branch of IHST



<http://www.easa.europa.eu/essi/ehestEN.html>



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Photo Eurocopter

Methodology

- Analysis of helicopter accidents using the JHSAT method
- Added HFACS by Wiegmann and Shappell to better understand the circumstances in which pilot errors occur, and to analyse Human Factors in general

Scope of analysis

- Data driven approach
 - ✦ Accidents (definition ICAO Annex 13)
 - ✦ Date of occurrence year 2000 - 2005
 - ✦ State of occurrence located in EASA Member States
 - ✦ Where a final report from AIB is available
- Preliminary results presented Portugal – Oct. 08
 - ✦ 186 accidents
- Interim results presented IHSS, Canada – Sep. 09
 - ✦ 303 accidents
 - ✦ Estimated to be some 75% of the published reports
 - ✦ Published on the EHEST website
- Final report 2000-2005 planned mid 2010



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General Data

SPS and HFACS Analysis

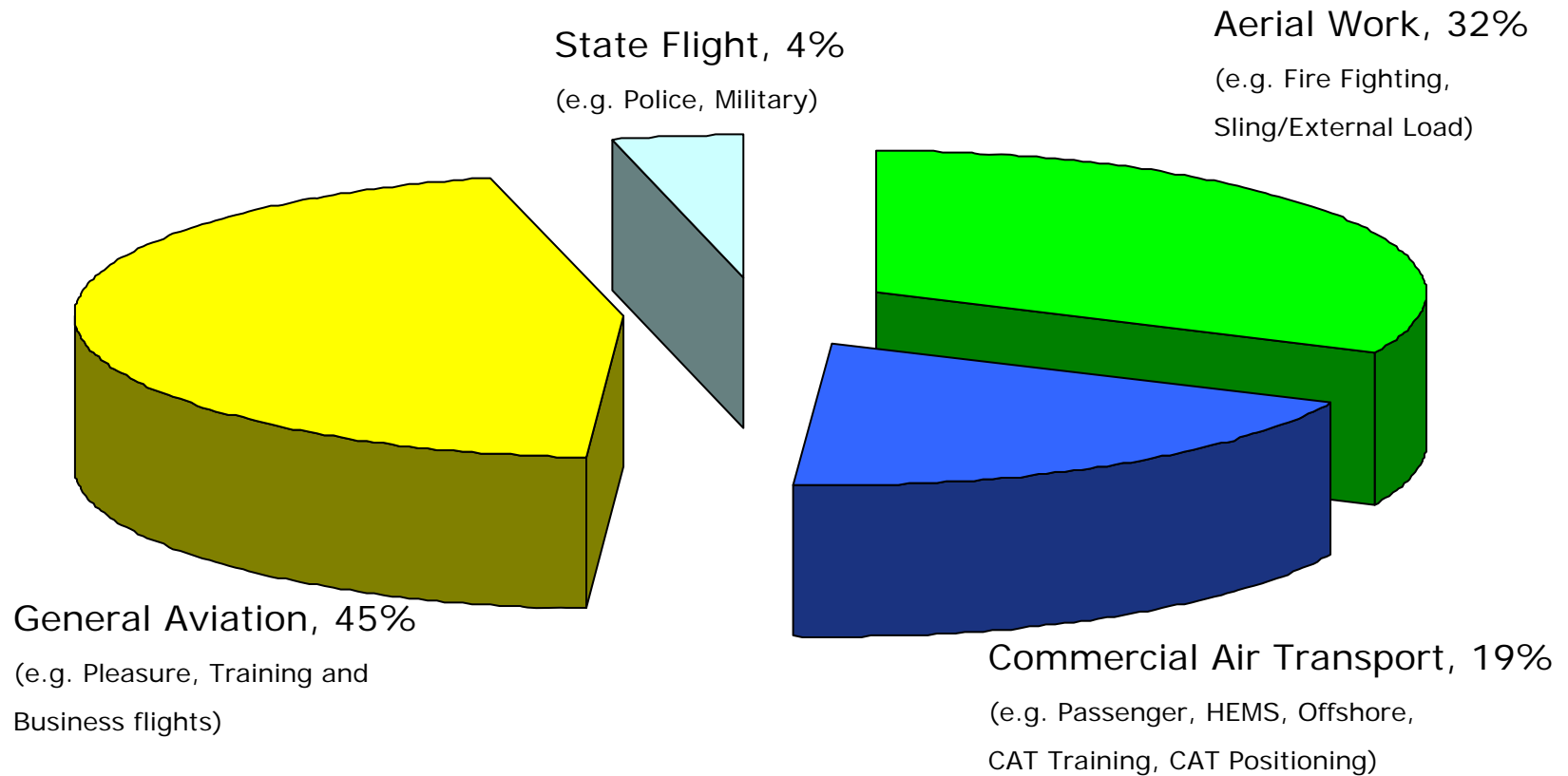
Intervention Recommendations

4. CONCLUDING REMARKS

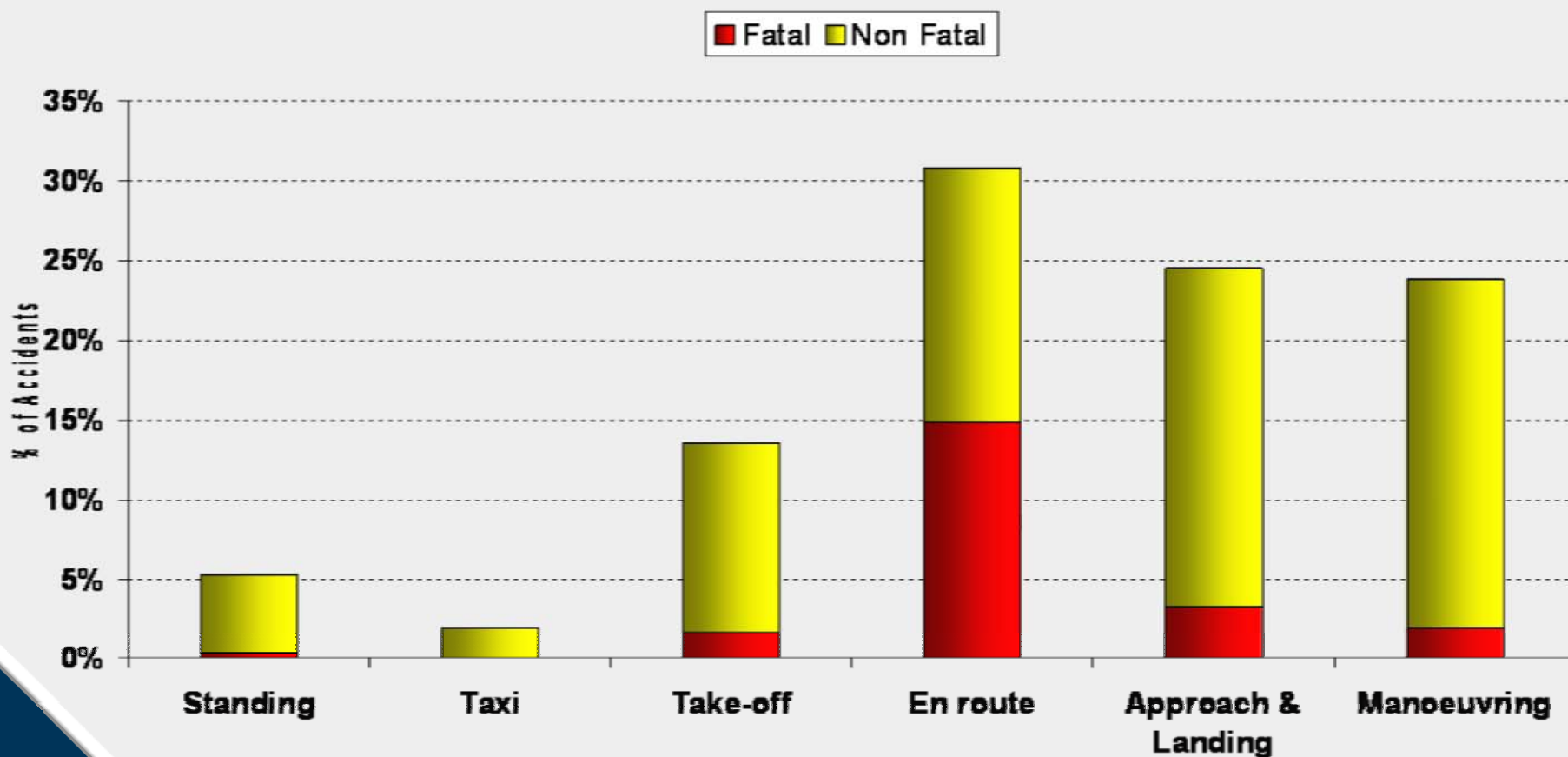


Photo AgustaWestland

Accident Distribution over Type of Operation EHSAT Dataset

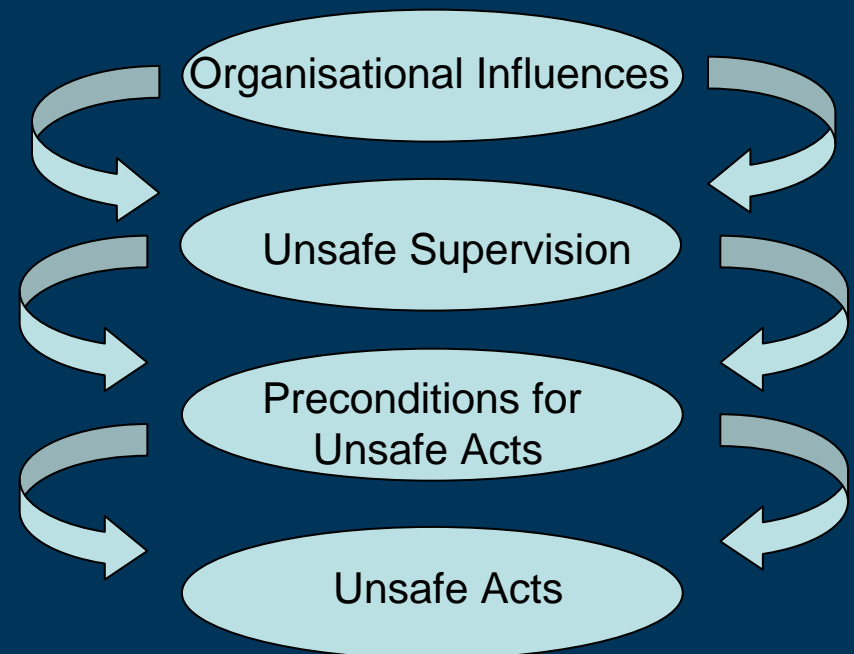


Accident Distribution over Phase of Flight EHSAT Dataset



Models used for identification of factors

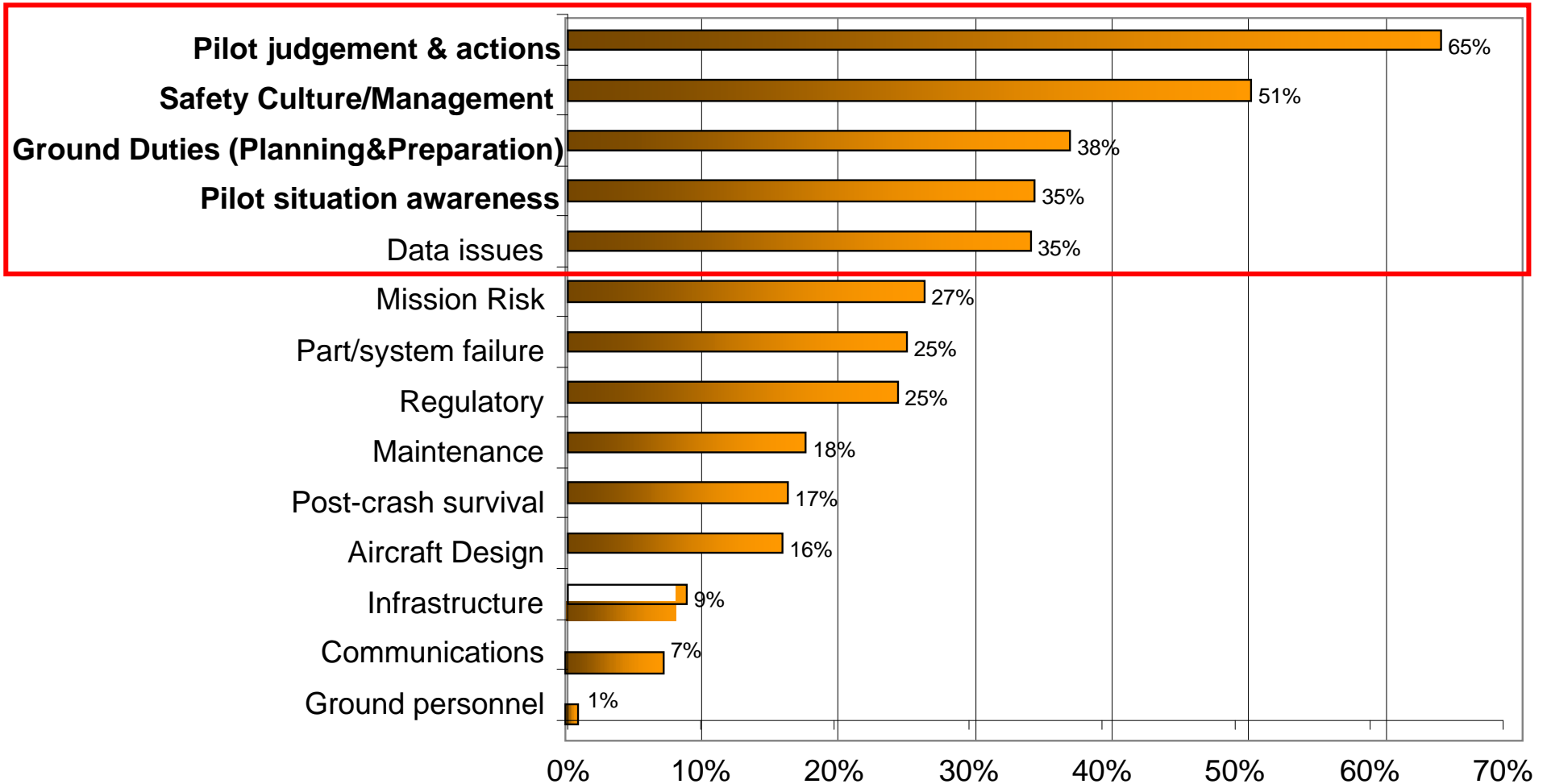
- Standard Problem Statements,
 - ✦ From the original, US team's methodology
 - ✦ 1775 factors recorded
- HFACS by Wiegmann and Shappell,
 - ✦ Added by the European team for a complementary analysis of Human Factors
 - ✦ 818 factors recorded



<http://hfacs.com/>

SPS analysis results

**% of Accidents where SPS level 1 has been identified at least once
EHSAT Dataset**



An example Commercial Air Transport scenario

- During a HEMS mission after the patient had been loaded the helicopter crew decided to continue the mission in deteriorating weather conditions.
- The decision to continue was taken because an ambulance was waiting to transfer the patient to hospital.
- During the take-off in poor visibility and falling snow the right front skid of the helicopter struck the surface and as a result it nosed over uncontrollably and impacted the ground.

An example Commercial Air Transport scenario

- During a HEMS mission after the patient had been loaded the helicopter crew decided to continue the mission in deteriorating weather conditions.
Loss of Visual Reference
- The decision to continue was taken because an ambulance was waiting to transfer the patient to hospital.
Inadequate decisions
- During the take-off in poor visibility and falling snow the right front skid of the helicopter struck the surface and as a result it nosed over uncontrollably and impacted the ground.
Pilot felt pressure

An example Commercial Air Transport scenario

SPS	HFACS
Pilot decision making	Decision Making - Operation
Self induced pressure	Risk assessment – Operation
Failed to follow procedures	Skill-based errors
Flight profile unsafe	Whiteout/Vision restricted
Inadequate oversight	Channelized attention
Reduced visibility	Communication critical information/Planning
Selection of inappropriate landing site	Pressing
Management – Failure to enforce company SOPs	Procedural Guidelines

An example Fire Fighting scenario

- The helicopter took off from the base to fly firemen to a forest fire.
- The helicopter arrived at the fire site. The pilot searched for a landing area to disembark the firemen.
- Finally he found an area. He saw a tree at his 3 o'clock position. He moved some meters forward and started a slow descent.
- The pilot heard a loud noise and the helicopter started yawing. The helicopter landed heavily and sustained substantial damage. The pilot and two firemen received minor injuries.

An example Fire Fighting scenario

- The helicopter took off from the base to bring firemen to a forest fire.

Natural landing sites

- The helicopter arrived at the fire site. The pilot searched for a landing area to disembark the firemen.

Environmental hazards

- Finally he found an area. He saw a tree at his 3 o'clock position and moved some meters forward and started a slow descent.

Inadequate decisions

- The pilot heard a loud noise and the helicopter started yawing. The helicopter landed heavily and sustained substantial damage. The pilot and two firemen

Pilot felt pressure

Insufficient company guidelines

SPS and HFACS Factors involved

SPS	HFACS
Landing procedures/Selection of remote landing site	Skill-based errors
Mission involves flying near hazards	Task Misprioritization
Flight procedure training (e.g. LTE, vortex ring)	Risk Assessment – During Operation
Inadequate pilot experience	Excessive Motivation to succeed
Pilot intensive: low/slow flight	Channelized attention
Failure to enforce company SOPs	Crew/team composition
Customer/Company pressure	Organisational process

An example General Aviation - Training scenario

- The dual exercise was for the student to practise emergency and autorotational landings.
- The landing area selected for the exercise was muddy with a forecast wind speed of 26 kts.
- As part of the exercise the flight instructor simulated an engine failure without any prior warning.
- During the subsequent autorotation the instructor allowed the rotor RPM to drop below the minimum.
- The helicopter contacted the ground with a high sink rate and rolled over.

An example General Aviation - Training scenario

- The dual exercise was for the student to practise emergency and autorotational landings.

Mission planning regards terrain and weather

- The landing area selected for the exercise was muddy with a forecast wind speed of 26 kts.

Insufficient briefing of the student on the training plan

- As part of the exercise the flight instructor simulated an engine failure without any prior warning.

Student control inputs uncoordinated

- During the subsequent autorotation the instructor allowed the rotor RPM to drop below the minimum.

The flight instructor interacted too late

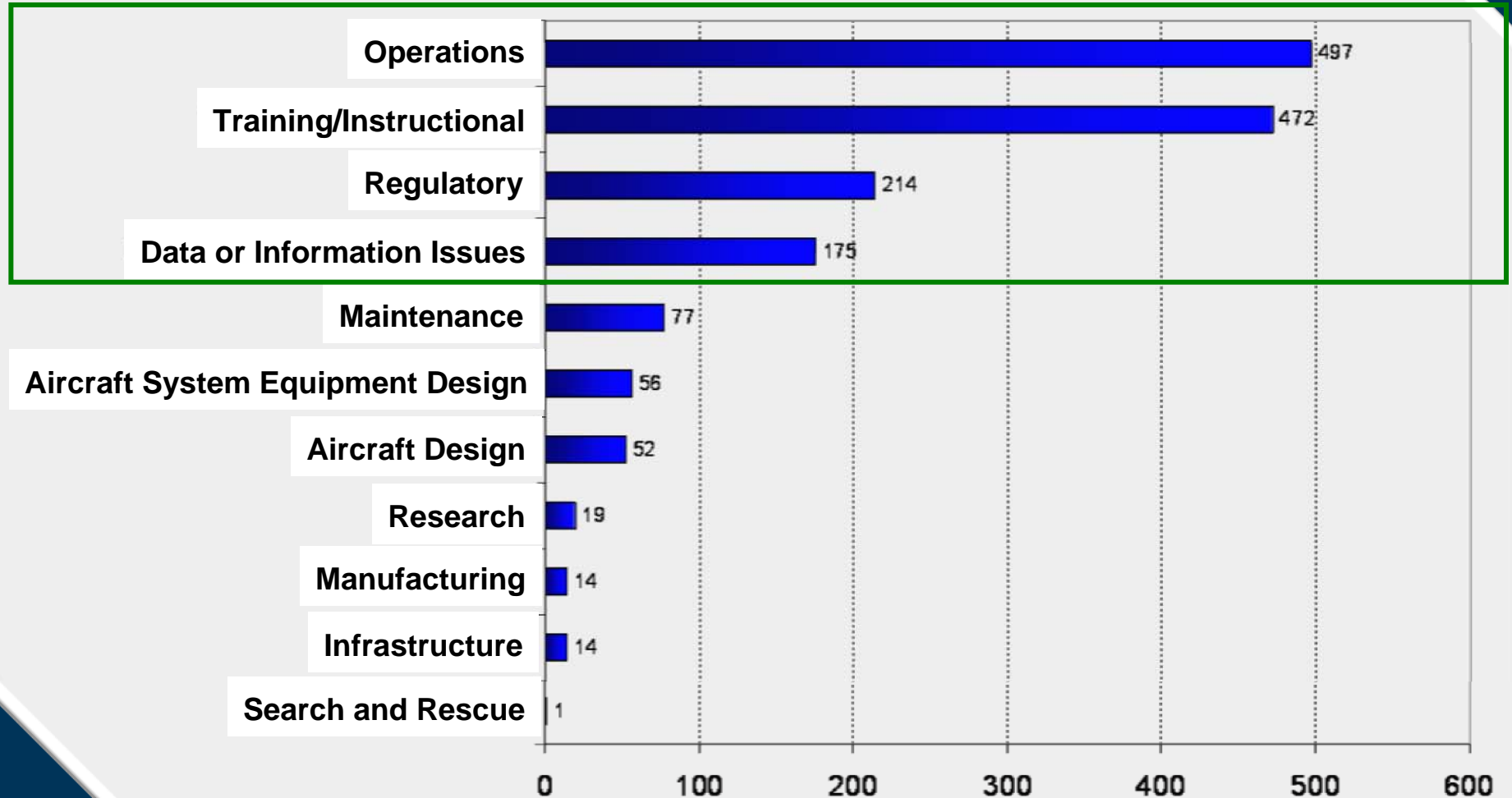
- The helicopter contacted the ground with a high sink rate and rolled over.

An example General Aviation - Training scenario

SPS	HFACS
Inadequate and untimely CFI action to correct student action	Risk assessment – Operation
Pilot decision making	Procedural error
Perceptual judgment errors	Overcontrol/Undercontrol
Inadequate mission planning: Weather and wind	Overconfidence
Training program management: CFI preparation and planning	Necessary action – Delayed
Inadequate landing procedures	Mission briefing
	Leadership/Supervision/Oversight inadequate
	Training Program/Guidelines

Intervention Recommendations

Total number of Intervention Recommendations (Level 1)



EHEST and EHSIT Sub-Teams

- EHEST Communication Sub-Group
Tasked to reach all European stakeholders,
with particular focus on General Aviation

- EHSIT Specialist Teams
launched in 2009 on:
 - ✦ SMS and Operations
 - ✦ Training
 - ✦ Regulation



Specialist Team SMS/Operations

➤ Consolidated recommendations:

- ★ **SMS:** Encourage the use of SMS based on real safety culture including risk management and codes of practice. EHEST promotes the SMS toolkit V2 by IHST (see www.ihst.org)
- ★ **SOPs:** Operators should be encouraged to establish and apply SOPs for all activities that they undertake.
- ★ **RISK ASSESSMENT/PRE-FLIGHT PREPARATION:** Emphasise the importance of Risk Assessment in mission planning

Specialist Team SMS/Operations

➤ Consolidated recommendations:

★ **SAFETY CULTURE:** Develop an engagement/communication plan to promote adherence to:

- ➔ the core principles of basic airmanship
- ➔ risk assessment
- ➔ rule compliance

★ **AIRCRAFT PERFORMANCE:** Reinforce familiarity with Flight Manual through awareness campaign and consider formal examination during annual flying check

Specialist Team Training

➤ Consolidated recommendations

- ★ **INEXPERIENCED PILOTS:** Training syllabus for ab-initio pilots should cover in more detail:
 - ➔ Mission planning
 - ➔ Vortex Ring / LTE
 - ➔ Autorotation and other emergencies
 - ➔ Passenger management

- ★ **DEGRADED FLIGHT CONDITIONS:** Specific training to improve decision making process for pilot before and after inadvertent entry into IMC

Specialist Team Training

➤ Consolidated recommendations

★ **TRAINING / HUMAN FACTORS:** Enhance instructor training in:

- ➔ Monitoring students
- ➔ Application of human factors principles
- ➔ Instructor intervention criteria

Specialist Team Regulation

- Consolidated recommendations
 - ★ EHSAT regulation related recommendations will mainly result in **reviewing certain OPS and FCL contents**
 - ★ **Proposals for improvement** will be communicated to Rulemaking using standard processes
 - ★ *WORK IN PROGRESS*

SMS and Accreditation scheme: EHEST promotes IS-BAO

- EHEST promotes IS-BAO by IBAC
 - ✦ **SMS + Accreditation scheme**
 - ✦ **European CEN Standard**
 - ✦ **Helicopter version in development**
 - ✦ **Europe-US coordination**

<http://www.ibac.org/isbao.php>

International Business Aviation Council
The recognized forum for leveraging strengths of Members to enhance the safety, acceptance and economic contribution of business aviation globally.

News Bulletins **IS-BAO** Aircrew Card Safety Security Environment Air Navigation

Introducing IS-BAO

IBAC Home	Overview	Keeping Current
Introduction to IBAC	Benefits of IS-BAO	Workshop Schedule
General Information	Ordering IS-BAO	Workshop Info, Applications and Fees
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- And the SMS Toolkit V2 by IHST

IHST International Helicopter Safety Team

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Deliverables 2010-2012

- **Safety actions towards organisations:** Operators and Operators Associations, FTOs, NAAs, ANSPs, DOAs, POAs, Part145, and Part M Organisations
- **Safety promotion material** targeting individual pilots and instructors and others
- **Best practice material** on Safety Management Systems (SMS), Standard Operating Procedures (SOPs), operational Risk Management, Safety Culture, and Training targeting in particular but not exclusively small operators
- **Rulemaking proposals** to be submitted to the competent authorities (ICAO, EASA, or NAAs) using standard rulemaking processes

Concluding Remarks

- Top 3 identified accident factor areas:
 - ✦ Pilot judgment & actions
 - ✦ Safety culture/management
 - ✦ Ground duties/Mission preparation
- HFACS enhances the analysis of Human Factors
- Top 3 recommendation categories:
 - ✦ Operations, SMS, and Safety Culture
 - ✦ Training
 - ✦ Regulation
- EHEST encourages intl. cooperation within IHST

Announcement I

- **IHSS 2010 will take place in Europe**
 - Cascais, Portugal, 3-4 Oct.
 - Just before Helitech (5-7 Oct.)
 - Jointly organised by IHST-US and EHEST
- Announcement and registration on www.ihst.org

Announcement II

- **Mark your calendar for AIRMED 2011**
 - Brighton, UK, **24-27 May 2011**
 - Convention Centre & Shoreham Airport

- Jointly organised by
 - **Kent Air Ambulance and**
 - **European HEMS & Air Ambulance Committee (EHAC)**

AIRMED Scientific Committee





www.airmed2011.org

24.05.2011

25.05.2011

26.05.2011

Room 1	Room 2	Room 3	Room 4	Time	Room 1	Room 2	Room 3	Room 4	Time	Room 1	Room 2	Room 3	Room 4
				9 AM	Morning event				9 AM	Morning event			
Opening ceremony				10 AM	Medical Effectiveness: Training & Simulation	Change	Safety Initiatives: EHEST & IHST	Workshop Pain Management in prehospital settings	10 AM	The benefits of HEMS: Outcome & inventions	M&M: Marketing & Media	Part OPS EU - A new invention?	
Ensuring quality by medical governance in HEMS	Management Tools	Safety Management Systems (SMS)	Workshop Standards in NVFR	11 AM					11 AM				
Panel discussion: Governing in aero-medical systems				12 PM	New interventions in pre-hospital treatment	People	Mission Equipment		12 PM	Medical challenges in fixed wing operations	Legal Environment	Workshop The ideal aircraft	
Lunch break				1 PM	Lunch break				1 PM	Lunch break			
Medical Updates Internal Medicine 1	Organisational governance	Special Operation Assistance	Workshop Airway Management Technical Aids	2 PM	Panel discussion: Safety & (Over) regulation - Enabling, measuring & safeguarding safety				2 PM	Panel discussion: Regional planning of air rescue systems			
Medical Updates Internal Medicine 2				3 PM	Networks: The role of supporting networks	Updates Air Ambulance	Training	Workshop Structure & organisation of air rescue systems	3 PM	Research: The latest results		Helipads	
Medical Updates Trauma 1	Tendering, competition & regional planning	Crucial Interfaces I		4 PM					4 PM				
				5 PM	Improving Outcome: Safeguarding information flow	Money I	Maintenance		5 PM	Medical Equipment and Standardisation			
Medical Updates Trauma 2	Crisis Management: Survival of crew and operator	Crucial Interfaces II	Workshop Invasive accesses in the context of fluid resuscitation	6 PM	The role of rotor & fixed wing in disasters	Money II	Operation in low visibility	Workshop Preparing & successful conducting ECMO and IABP transports	6 PM	Closing ceremony			
				7 PM					7 PM				



Photos AgustaWestland and Eurocopter

The challenge now is to develop, implement and monitor effective measures to meet the 80% accident rate reduction target

Thank you for your attention

Questions?

Mailbox: ehest@easa.europa.eu