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The European Helicopter Safety Team (EHST): 2008/2009 Achievements

Michel MASSON, EASA, EHST Secretary and EHSAT co-chair (Presenter)
michel.masson@easa.europa.eu

Marieke VAN HIJUM, EASA
marieke.van-hijum@easa.europa.eu

Martin BERNANDERSSON, CAA Sweden
martin.bernanderesson@transportstyrelsen.se

Andy EVANS, AviateQ Intl., EHSAT co-chair
andy.evans@AviateQ.com

1. EHEST PRESENTATION

2. METHODOLOGY

3. ANALYSIS RESULTS

4. SAFETY IMPROVEMENTS

5. CONCLUDING REMARKS



Picture Source Eurocopter

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

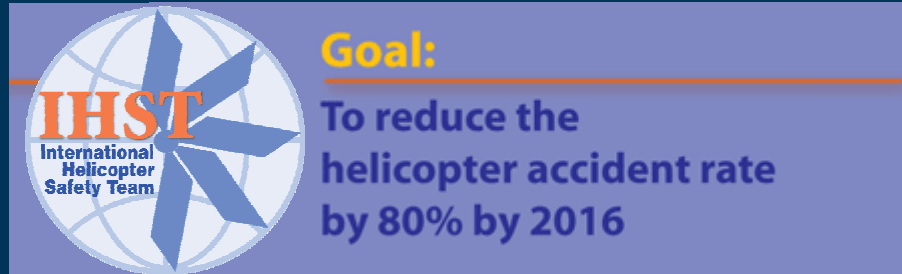


Goal:

To reduce the
helicopter accident rate
by 80% by 2016



The International Helicopter Safety Team IHST



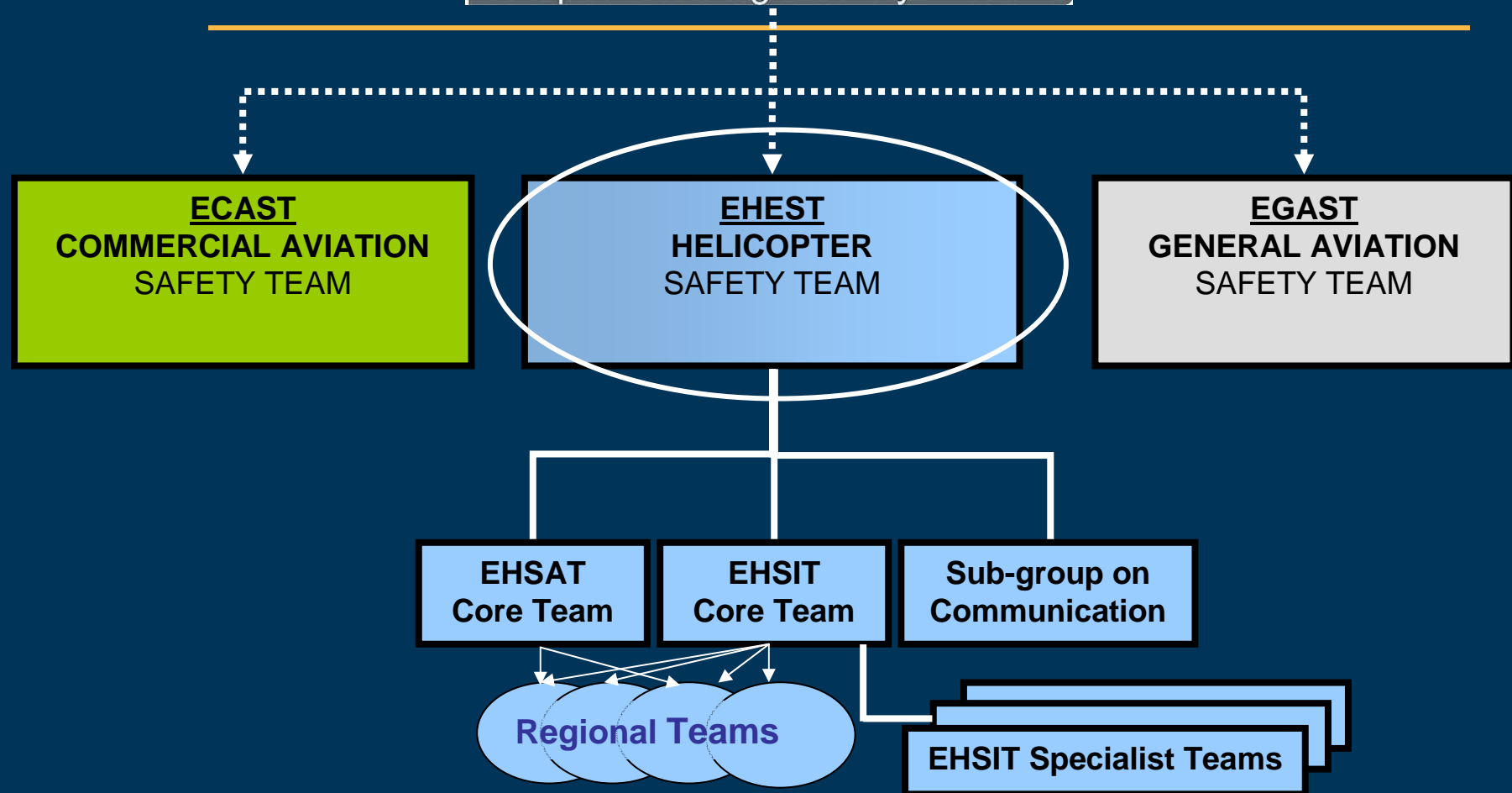
- Formed after the International Helicopter Safety Symposium, held in Montreal in 2005 initiated in USA
- US based, truly international Authorities – Industry partnership
<http://www.ihst.org/>
- Formed on the model of Commercial Aviation Safety Team CAST

The European Strategic Safety Initiative ESSI

- 10 year programme (2006-2016) aimed at improving aviation safety in Europe, and for the European citizen worldwide
- Partnership, with more than 150 organisations
- Powered by industry and facilitated by EASA

www.easa.europa.eu/essi







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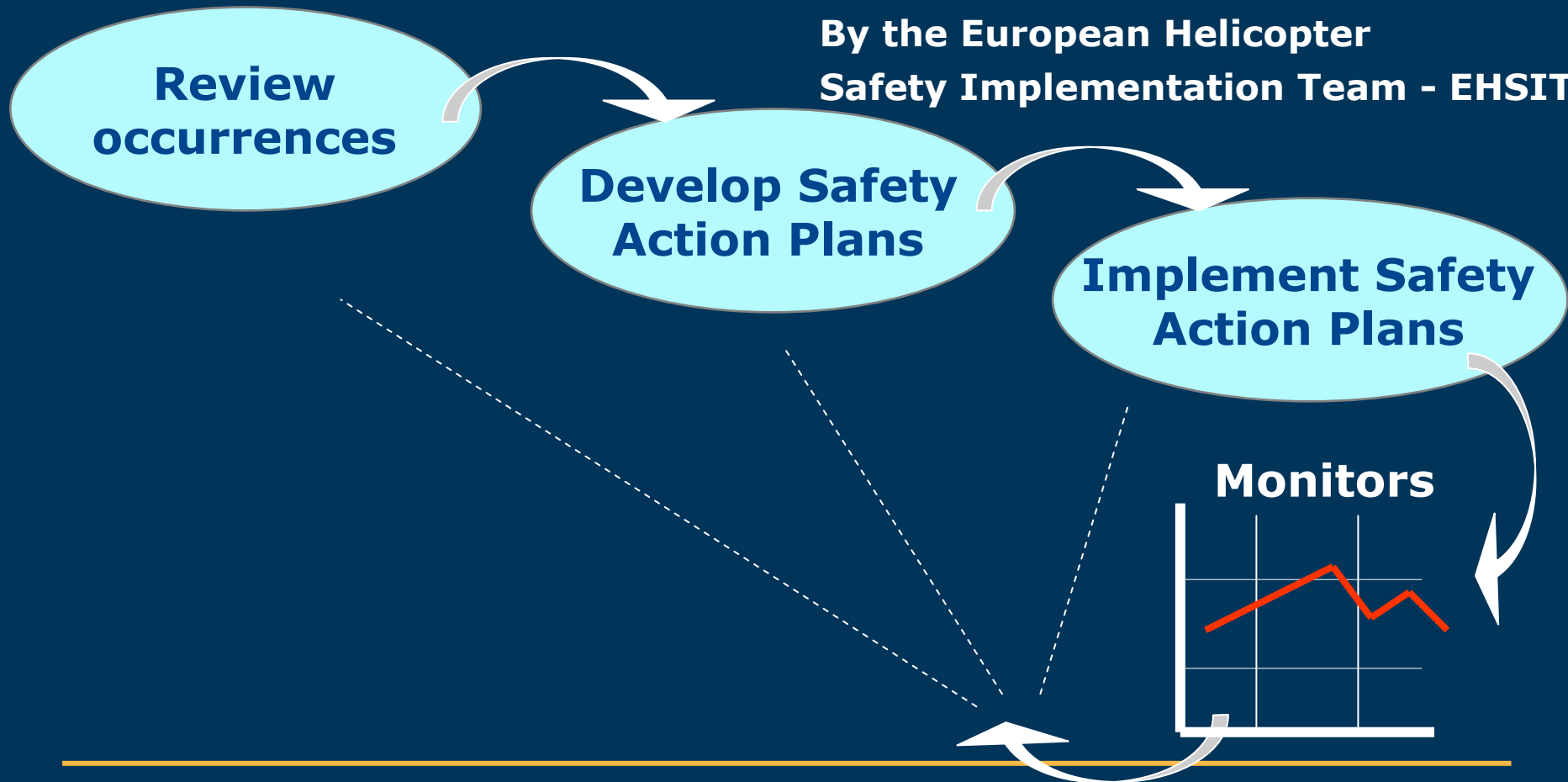


Picture Source Eurocopter

General Process

By the European Helicopter Safety Analysis Team - EHSAT

By the European Helicopter
Safety Implementation Team - EHSIT



Scope of analysis

➤ Data driven approach

- ★ **Accidents (definition ICAO Annex 13)**
- ★ **Date of occurrence year 2000 - 2005**
- ★ **State of occurrence located in Europe**
 - ➔ For this purpose Europe is defined as the EASA Member States (27 EU + plus Iceland, Liechtenstein, Norway and Switzerland)
- ★ **Where a final report from Accident Investigation Board is available**

Analysis Methodology

**1. Collect general occurrence information
*from accident report***



**2. Describe and analyse the accident
*Identify events (what happened)
and factors (why it happened) in free text***



**3. Assign standard codes to factors
*Standard Problem Statements (SPS)
from IHST taxonomy and HFACS***



4. Produce Intervention Recommendations (IR)

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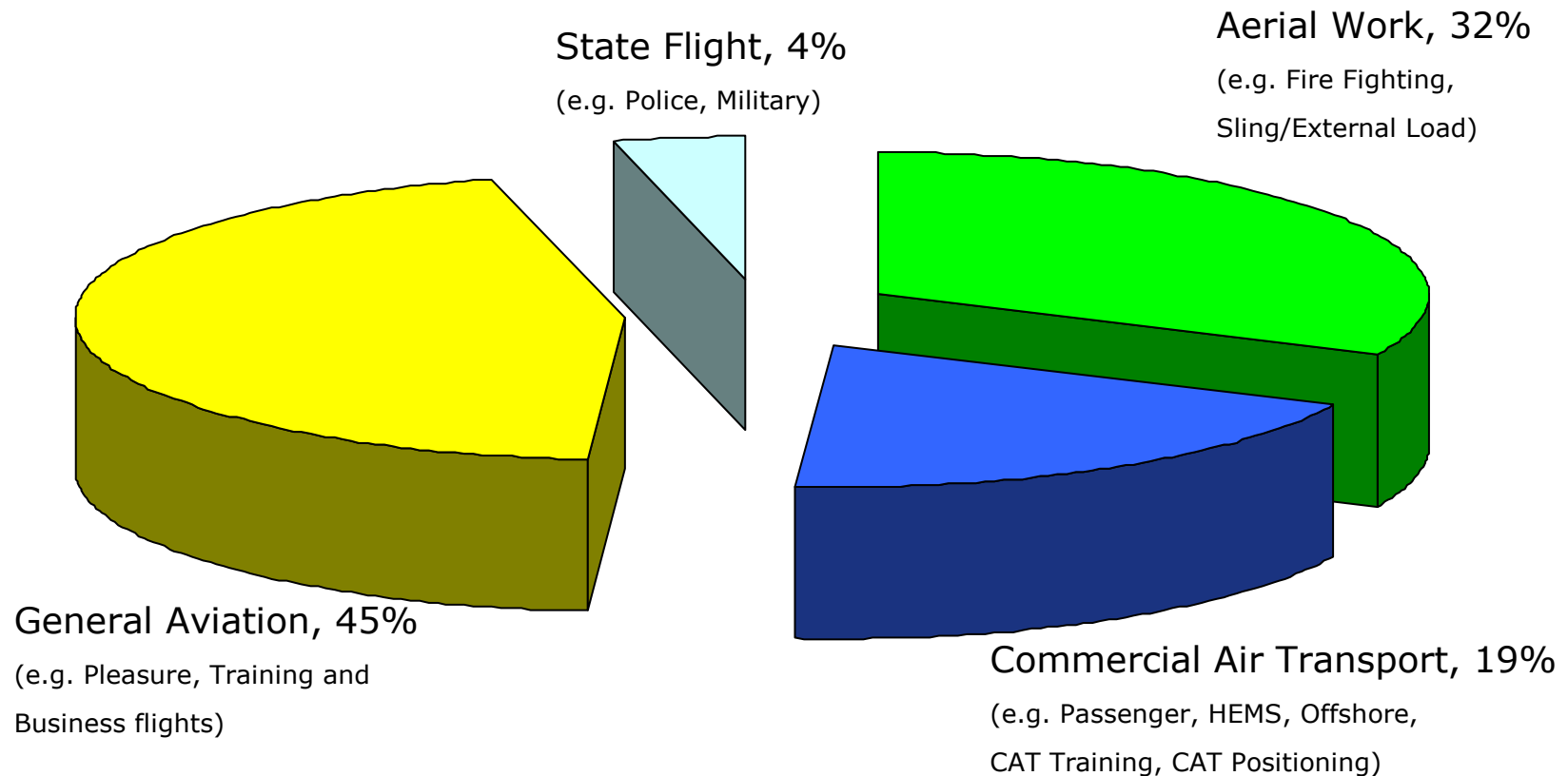
Analysis is an ongoing activity.

While the article published in the Conference Proceedings presents the preliminary results as of 30 Sep. 2008, this Powerpoint presentation provides the latest results revision as of 20 August 2009

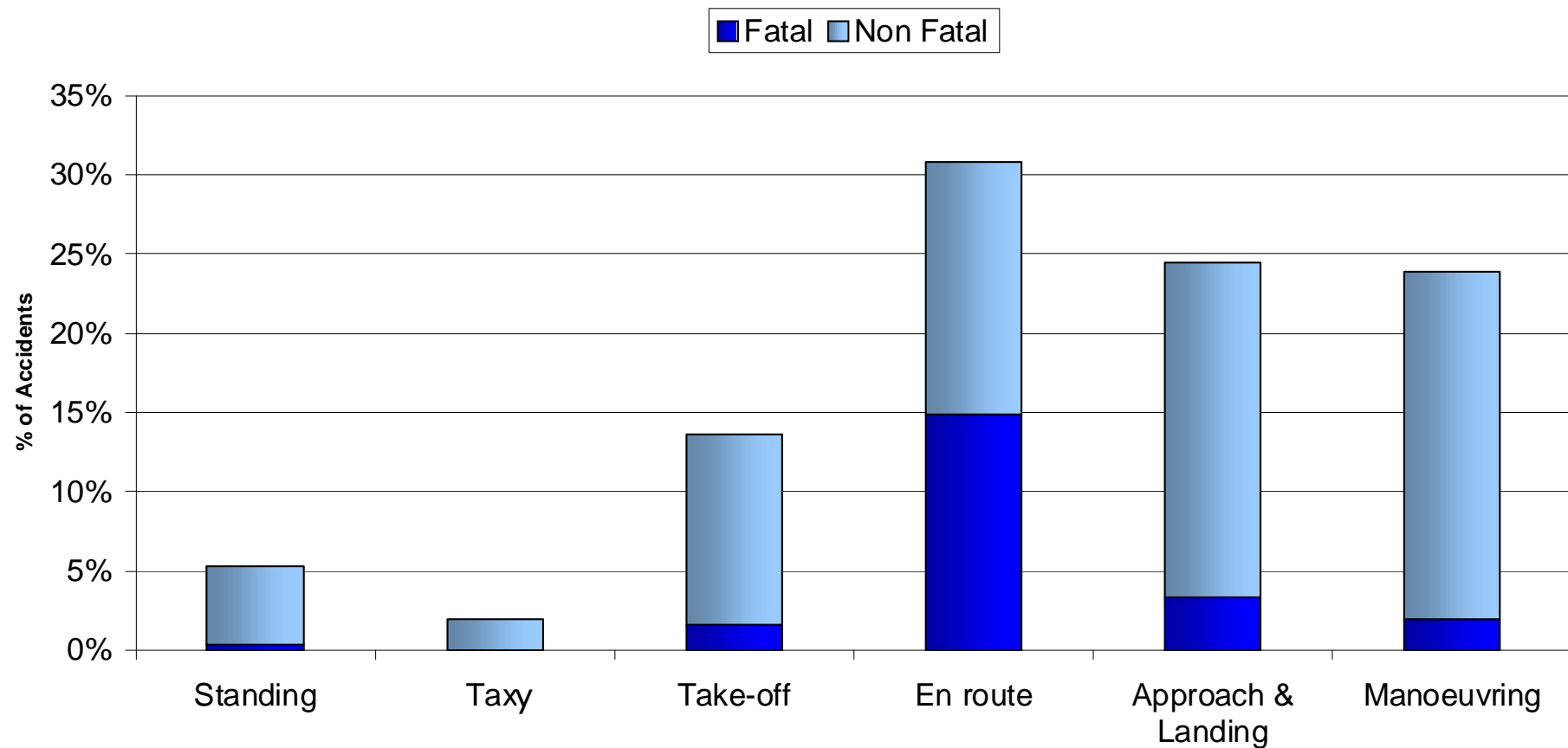
Scope of interim dataset

- **Total of 303 accidents within timeframe 2000-2005 have been analysed**
- **Covers work from 11 Regional Teams across Europe**
 - ★ **Estimated to be some 75% of the published reports available**

Accident Distribution over Type of Operation EHSAT Dataset



Accident Distribution over Phase of Flight EHSAT Dataset



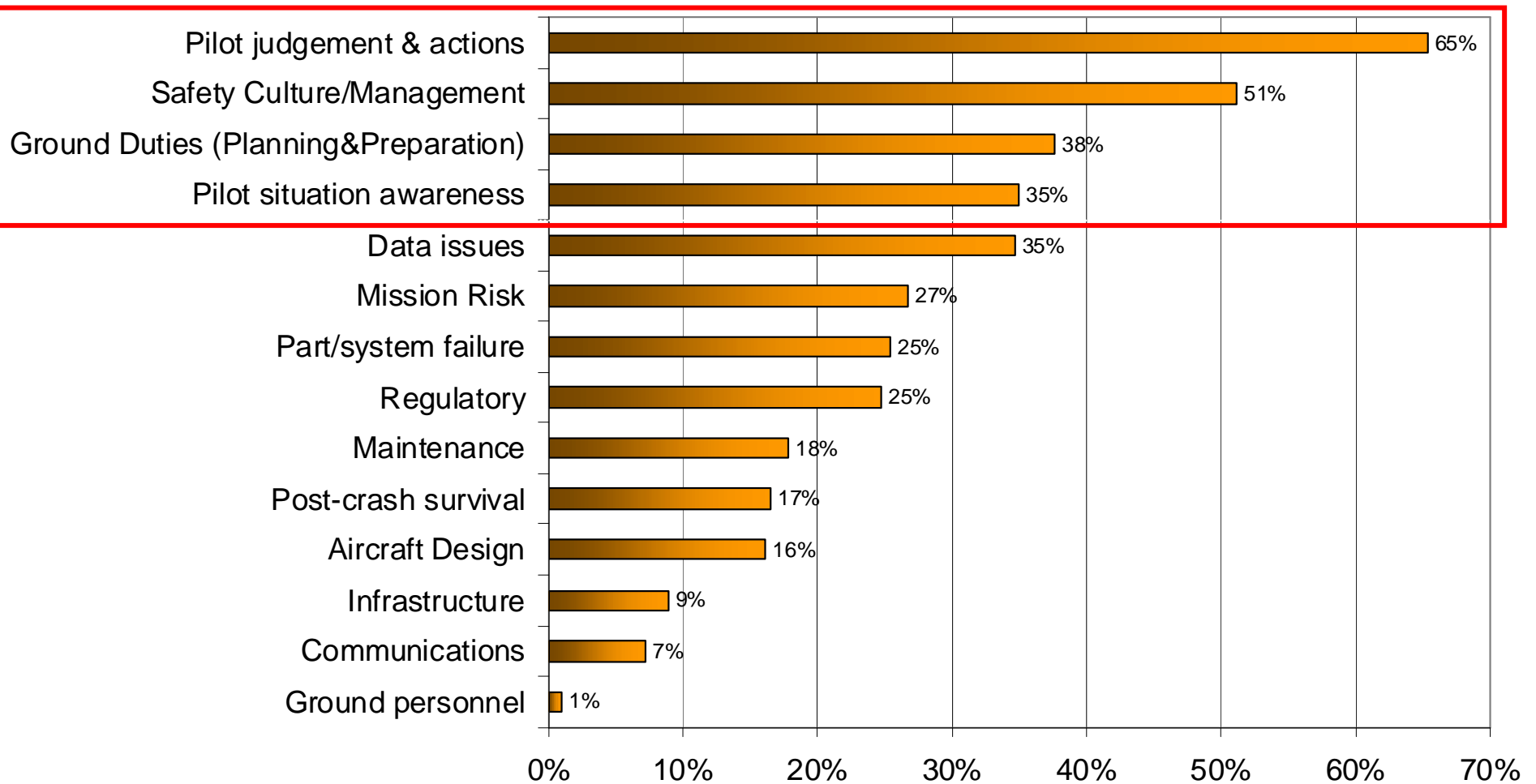
Models used for identification of factors

- **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**

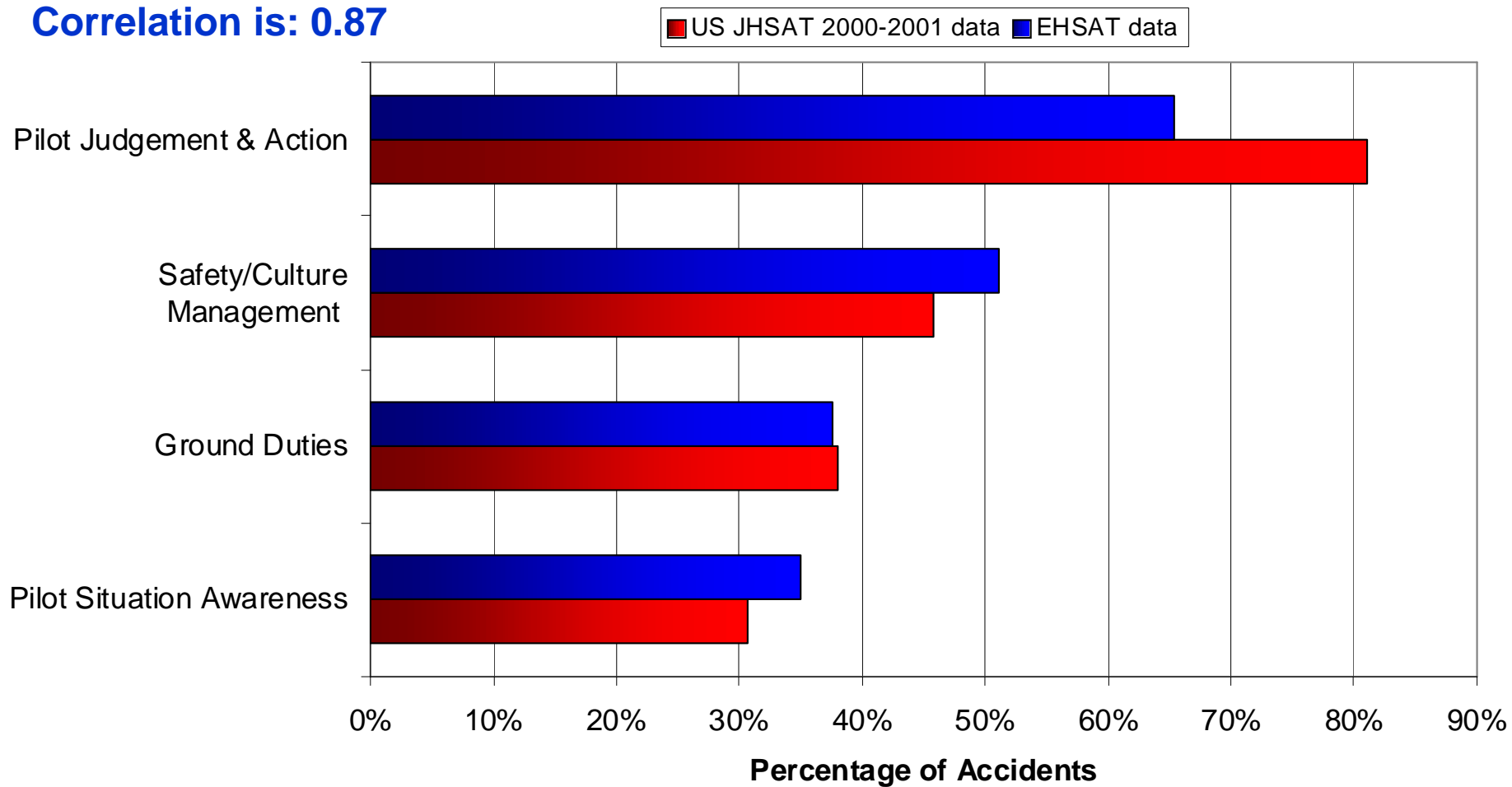
1. SPS analysis results

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



Comparison of EHSAT data with US JHSAT data SPS level 1, Top 4

Correlation is: 0.87



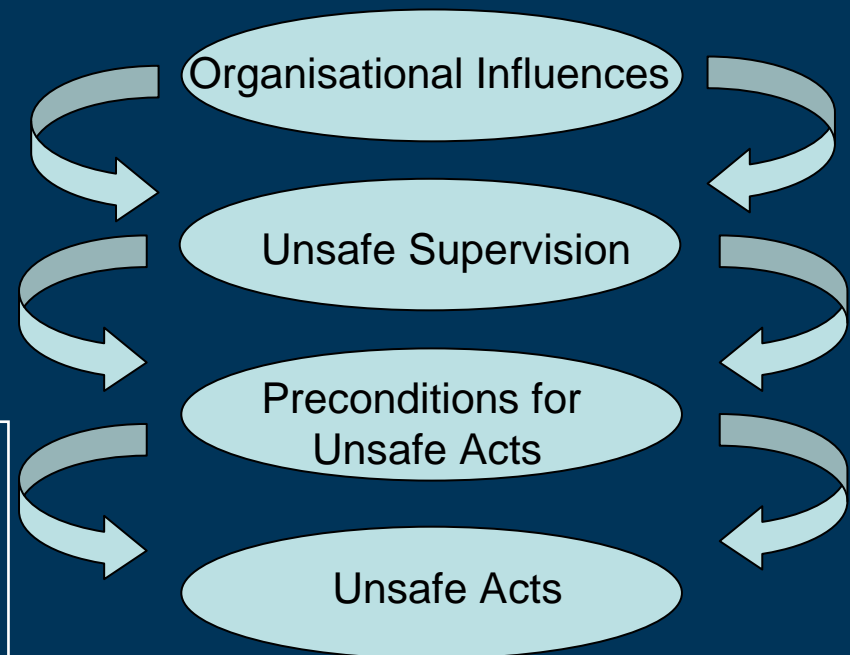
2. HFACS model and analysis results

➤ HFACS by Wiegmann and Shappell

- ★ **Proven tool for analysing unsafe acts / human errors and their causes**

- ★ **Human error is the start of HFACS classification not the conclusion**

- ★ **Over 170 codes in 4 areas**



<http://hfacs.com/>

An example Commercial Air Transport scenario

- **Once the patient was boarded the helicopter took off despite the degraded weather condition because an ambulance was waiting to bring the patient to the hospital.**
- **The helicopter hit the ground (snowed surface) with the right skid and nosed over just after take off in poor visibility due to falling and blowing snow.**

An example Commercial Air Transport scenario

- Once the patient was boarded the helicopter took off despite the degraded weather condition because an ambulance was waiting to bring the patient to the hospital.
Loss of Visual Reference
Inadequate decisions
- The helicopter hit the ground (snowed surface) with the right skid and nosed over just after take off in poor visibility due to falling and blowing snow.
Pilot felt pressure

Commercial Air Transport

Top issues – Commercial Air Transport	
Top issues Standard Problem Statements	Top issues HFACS
Pilot decision making	Brownout/whiteout
Pilot-in-Command self induced pressure	Decision-making during operation
Pilot's flight profile unsafe for conditions	Communication critical information
Reduced visibility – whiteout, brownout	Pressing
Pilot inexperienced with area and/or mission	Risk assessment – during operation
Pilot experience leads to inadequate planning regarding weather/wind	Procedural error
Selection of inappropriate landing site	Excessive motivation to succeed
Management disregard of known safety risk	Mission planning
Inadequate consideration of aircraft operational limits	Inattention
Failure to enforce company SOPs	Limited recent experience
	Procedural guidelines/publications

*Table 1 - Top issues for Helicopter Commercial Air Transport operations
(Excluding factors related to Data Issues)*

An example Aerial Work scenario

- **During vertical take off with external cargo from a confined landing area in the forest, the helicopter started to rotate to the left after having cleared the tree tops.**
- **The helicopter lost altitude, contacted the surrounding trees and crashed.**

An example Aerial Work scenario

- Operated near maximum take-off mass
Obstacles
Pilot intensive
- The helicopter lost altitude, contacted the surrounding ground and crashed.
Tailwind

Loss of tail rotor effectiveness

Cargo not released

Aerial Work

Top issues – Aerial Work	
Top issues Standard Problem Statements	Top issues HFACS
Mission involves flying near hazards, obstacles, wires	Risk assessment - during operation
Pilot decision making	Channelised attention
Mission requires low/slow flight	Mission planning
Low flight near wires	Decision-making during operation
Inadequate consideration of obstacles	Error due to misperception
Diverted attention, distraction	Inattention
Risk management inadequate	Misperception of Operational Condition
Inadequate response to loss of tail rotor effectiveness	Excessive motivation to succeed
Inadequate training on avoidance, recognition and recovery of vortex ting state or LTE	Fatigue – Physiological/Mental
	Windblast
	Overconfidence
	Limited total experience

*Table 2 - Top issues for Helicopter Aerial Work operations
(Excluding factors related to Data Issues)*

An example General Aviation scenario

- **The helicopter was on a Visual Flight Rules flight. En route, it entered an area of rising terrain and low cloud base.**
- **Radar tracking indicates that the helicopter slowed down, and then made a sharp turn before disappearing off the screen.**
- **The helicopter then suffered an in-flight collision with terrain directly after the loss of radar contact.**

An example General Aviation scenario

➤ The helicopter was on a Visual Flight Rules flight en route, it entered an area of rising terrain and low cloud base.

➤ Radar tracking indicates that the helicopter slowed down, and then made a sharp turn before disappearing off the screen.

➤ The helicopter then suffered an in-flight collision with terrain directly after the loss of inadvertent IMC

Limited experience

General Aviation

Top issues – General Aviation	
Top issues Standard Problem Statements	Top issues HFACS
Pilot decision making	Risk assessment - during operation
Mission planning –other	Overconfidence
Inadequate consideration of weather/wind	Vision restricted by meteorological conditions
Pilot inexperienced	Procedural error
Pilot control/handling deficiencies	Mission planning
Pilot misjudged own limitations/capabilities	Decision-making during operation
External environment awareness – Other	Overcontrol/Undercontrol
Disregard of known safety risk	Violation – Lack of discipline
Failed to recognise cues to terminate current course of action or manoeuvre	Inadvertent Operation
	Error due to misperception
	Channelised attention
	Get-Home-Itis/Get-There-Itis
	Misperception of operational condition

*Table 3 - Top issues for Helicopter General Aviation operations
(Excluding factors related to Data Issues)*

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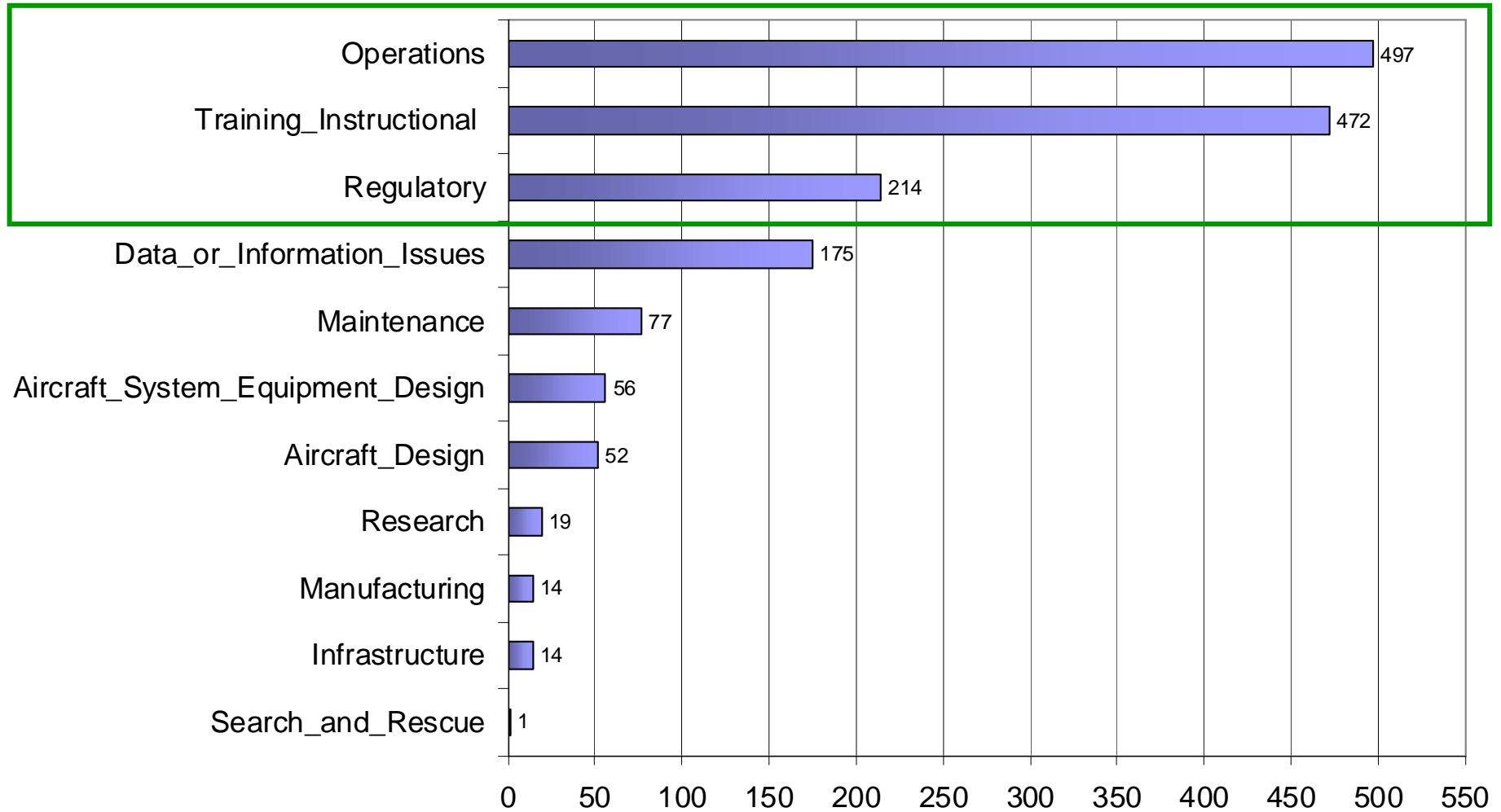


Picture Source Eurocopter

Intervention Recommendations

- **In total 11 Intervention Recommendation categories identified**
- **The categories help identify priority areas for safety enhancements**

Total number of Intervention Recommendations (Level 1)



Specialist Teams on SMS & Operations and on Training

- **Intervention recommendations were aggregated and consolidated by the EHSIT**
- **And handed over to Specialist Teams tasked to develop safety enhancements**



IHST Safety Toolboxes

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IHST

International Helicopter Safety Team

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Enter Title

➤ In parallel, IHST US has published Safety Toolboxes on:

- ✦ SMS
- ✦ Helicopter Flight Data Monitoring
- ✦ Risk Assessment

➤ Freely accessible on: www.ihst.org

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Concluding remarks

- **The top 4 identified SPS areas are:**
 - ✦ **Pilot judgment & actions**
 - ✦ **Safety culture/management**
 - ✦ **Ground duties/Mission preparation**
 - ✦ **Pilot situation awareness**
- **High correlation with US results on top level SPS factors**
- **Differences were observed for the various types of operations**
- **HFACS enhances the analysis of Human Factor issues**

Concluding remarks

- **Work continues within EHSIT and its Specialist Teams**
- **Continuous cooperation with IHST US**
- **Attention on communication with stakeholders**

- **To join the initiative, please contact:**

EHEST@easa.europa.eu



Picture Source Eurocopter

*Thank you for your attention
Questions?*

Contacts:

Michel Masson, PhD

EASA Safety Action Coordinator, Secretary

michel.masson@easa.europa.eu

Tel: + 49 221 89990 2024

Clement Audard

EASA Safety Team Support Officer, Secretary

clement.audard@easa.europa.eu

Tel: +49 221 89990 2038

Mailbox

EHEST@easa.europa.eu