Safety Partnership: 2008/2009 Achievement by the European Helicopter Safety Team (EHEST)

3rd EASA Rotorcraft Symposium
2-3 Dec 2009, Cologne

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1. SETTING THE SCENE

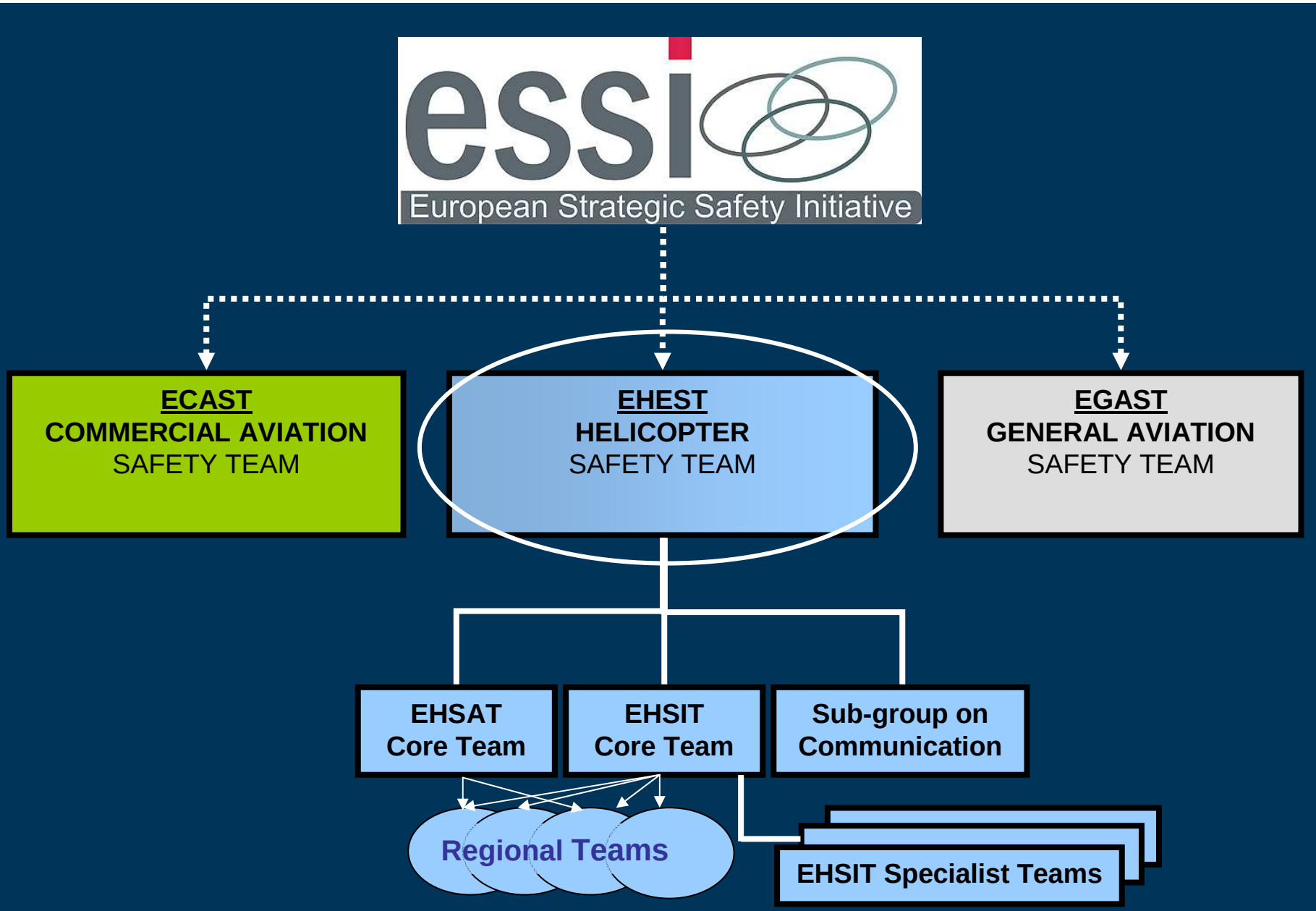
2. METHODOLOGY

3. INTERIM RESULTS

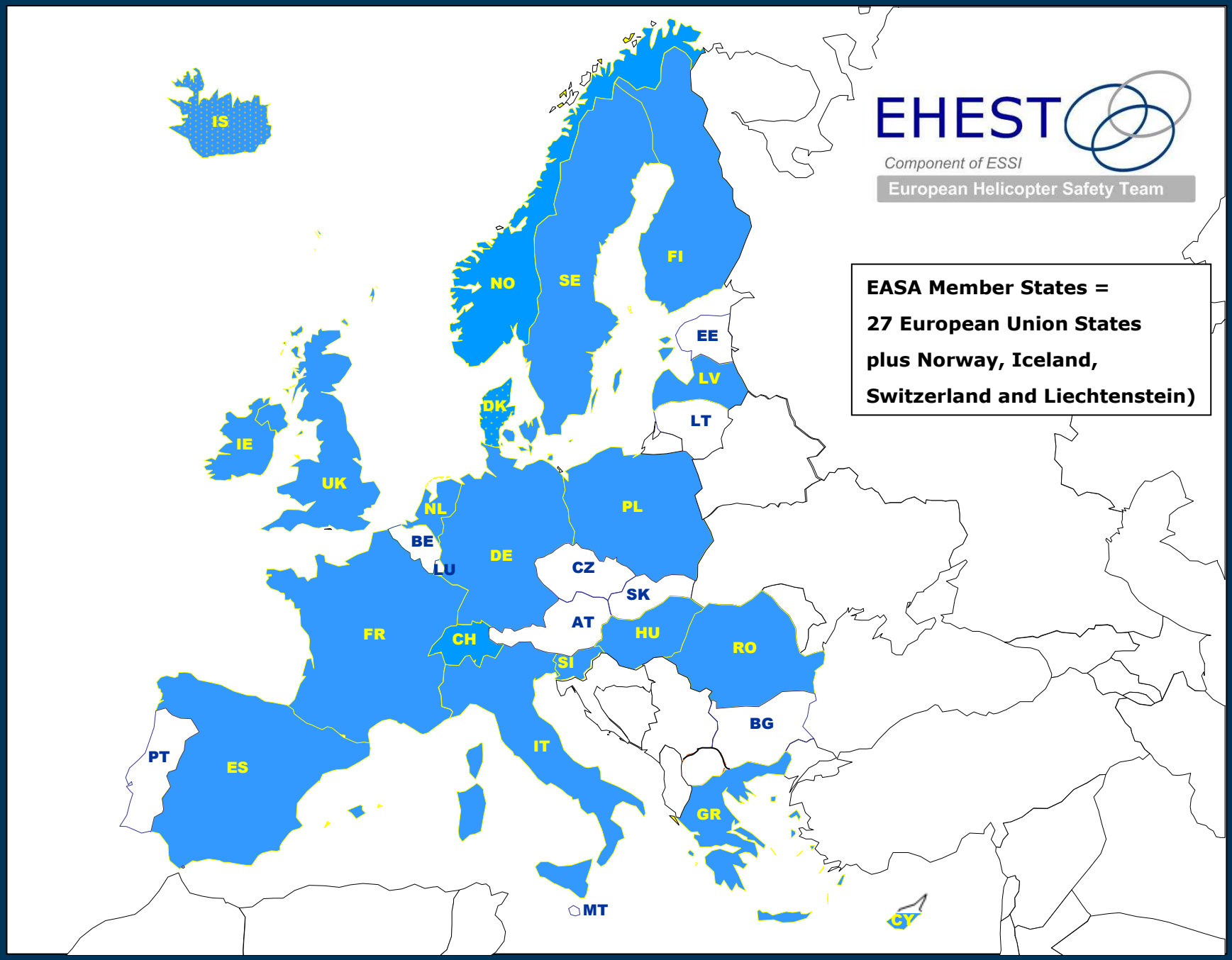
4. CONCLUDING REMARKS

Photo Vasco Morao

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



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


EHEST
Component of ESSI
European Helicopter Safety Team
EASA Member States =
27 European Union States
plus Norway, Iceland,
Switzerland and Liechtenstein)
IS
NO
SE
FI
EE
LV
LT
DK
IE
UK
NL
BE
LU
DE
PL
CZ
SK
AT
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SI
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PT
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IT
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MT
CY

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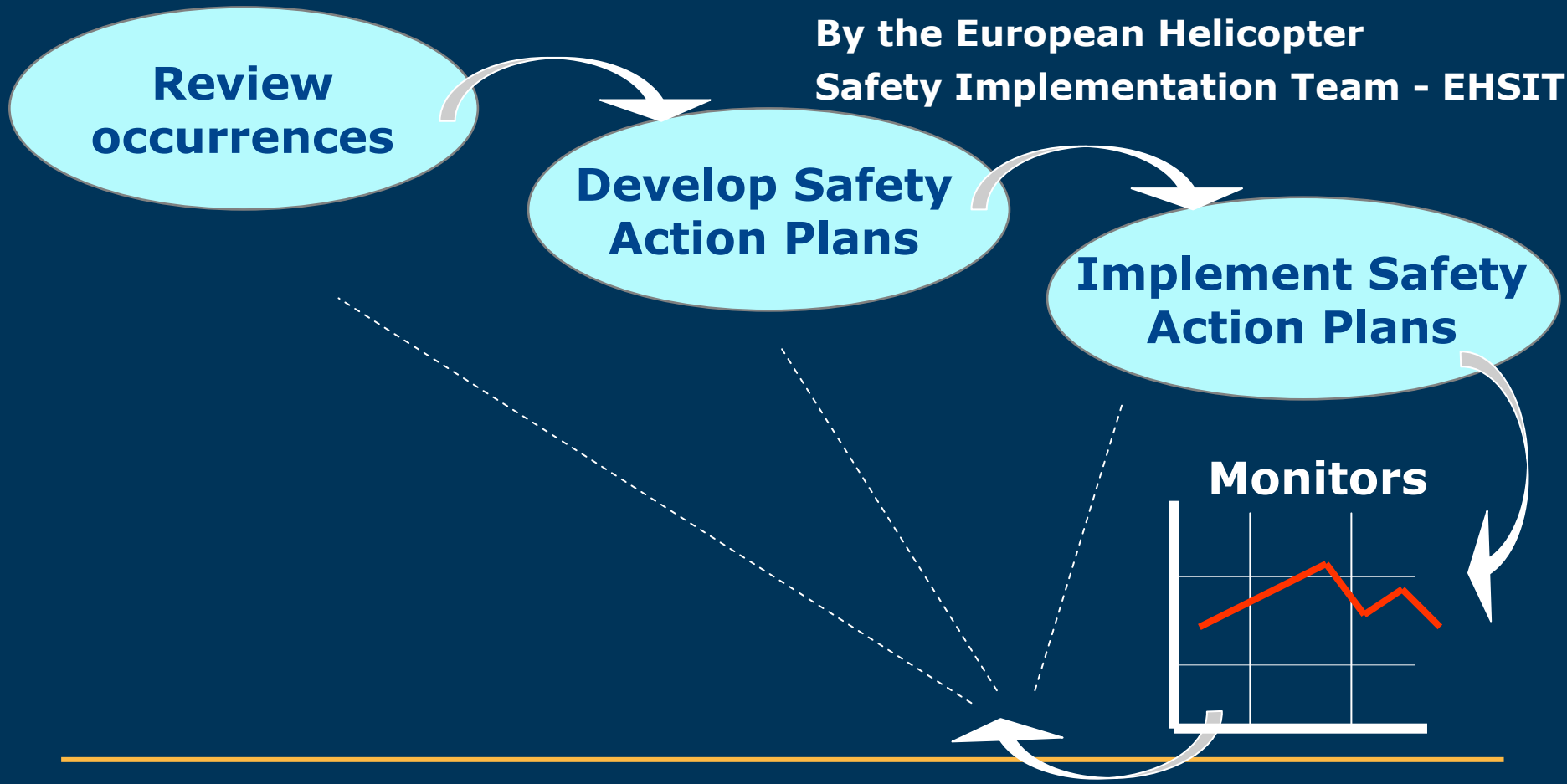
Photo Eurocopter

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 EASA Member States
  - Where a final report from AIB is available
- 303 accidents within timeframe analysed (as of 20 Aug. 09)
  - Estimated to be some 75% of the published reports
- Scope will be extended in a later stage

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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General Data

SPS and HFACS Analysis

Intervention Recommendations

4. CONCLUDING REMARKS

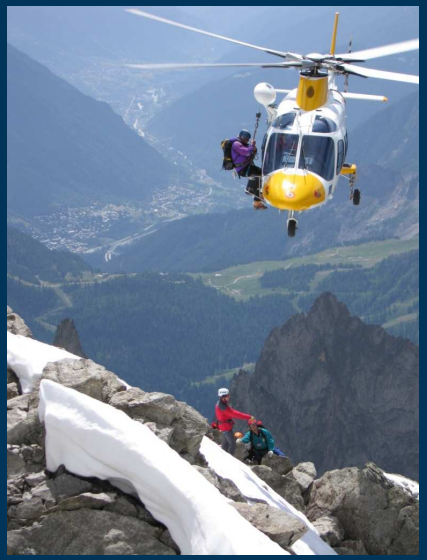
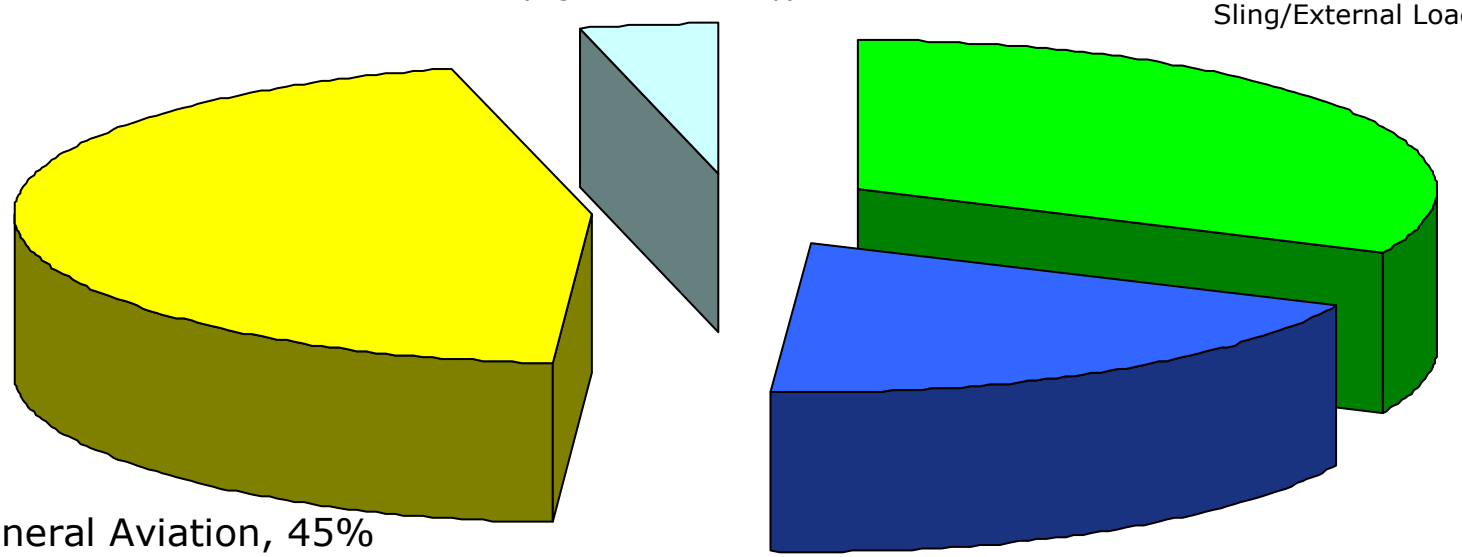


Photo AgustaWestland

Accident Distribution over Type of Operation
EHSAT Dataset



State Flight, 4%

(e.g. Police, Military)

Aerial Work, 32%

(e.g. Fire Fighting,

Sling/External Load)

General Aviation, 45%

(e.g. Pleasure, Training and

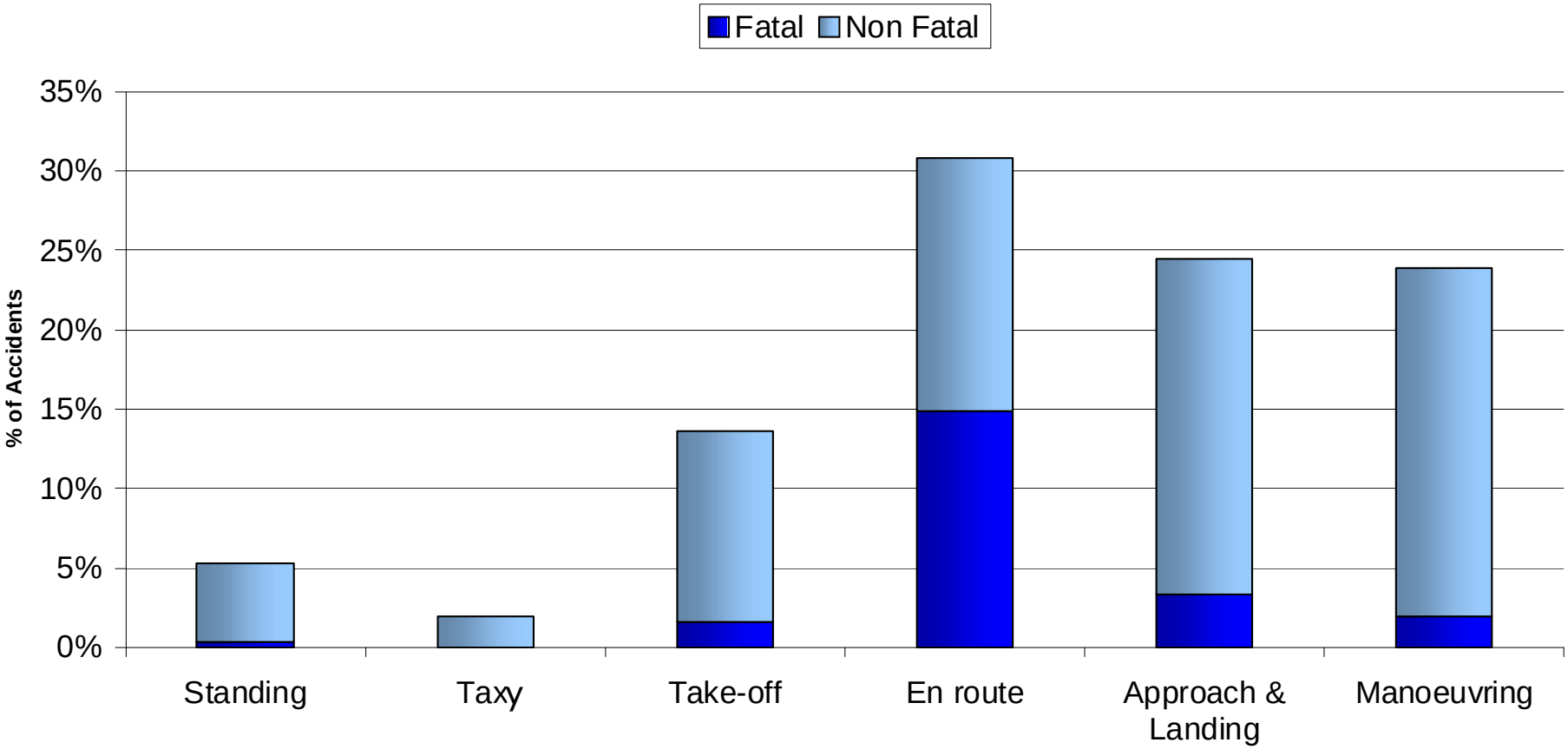
Business flights)

Commercial Air Transport, 19%

(e.g. Passenger, HEMS, Offshore,

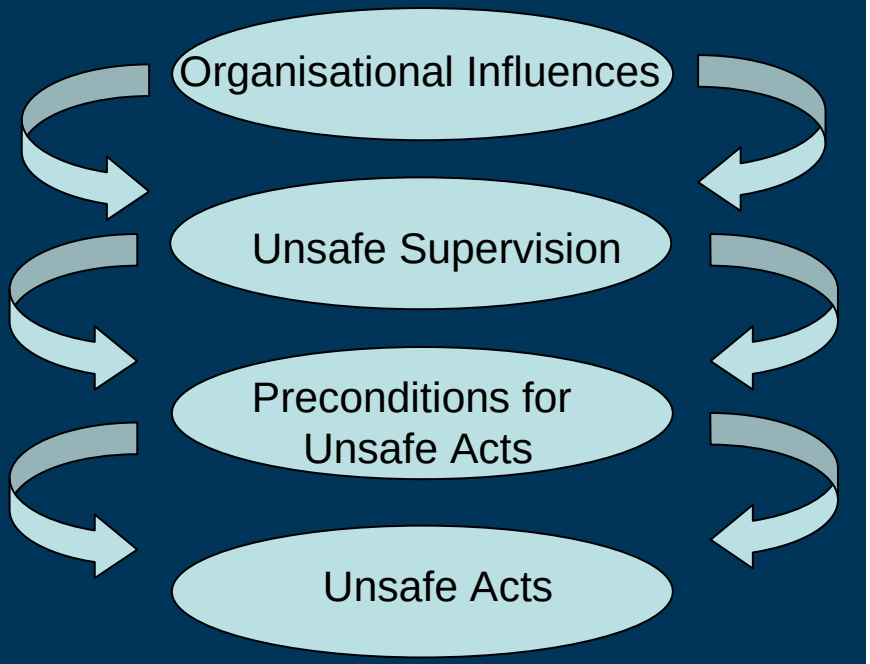
CAT Training, CAT Positioning)

Accident Distribution over Phase of Flight
EHSAT Dataset



Models used for identification of factors

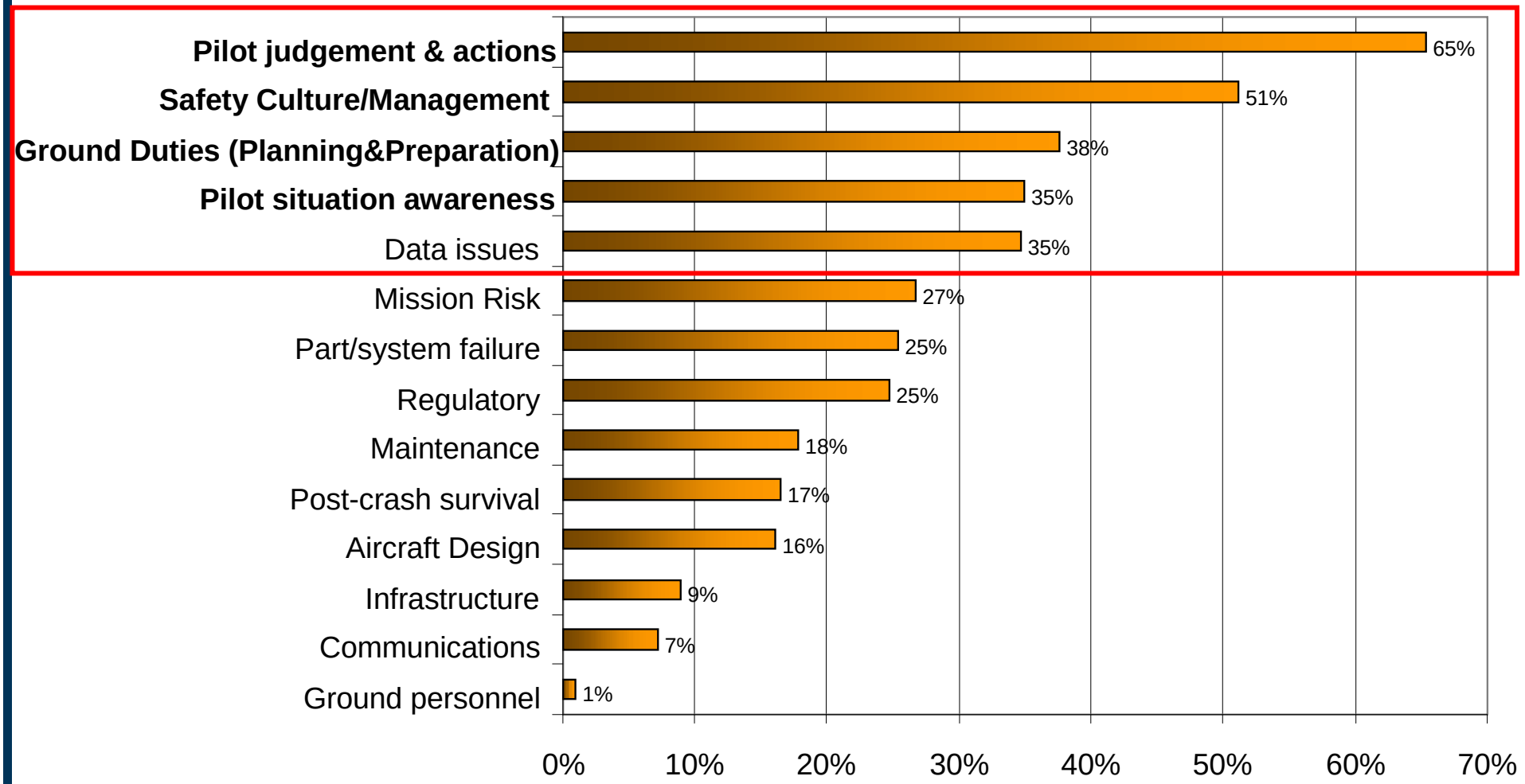
- Standard Problem Statements,
  - From the original, US team's methodology
  - 1775 factors recorded
- HFACS by Wiegmann and Shappell,
  - Added by the European team for a complementary analysis of Human Factors
  - 818 factors recorded



http://hfacs.com/

SPS analysis results

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



Example scenarios

- Example accident scenarios presented for
  - Commercial Air Transport
  - General Aviation

- Scenarios illustrate the most identified SPS statements and HFACS codes for the types of operation

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

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Loss of Visual Reference

Inadequate decisions

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 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.

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Mission planning regards terrain and weather

Insufficient briefing of the student on the training plan

Student control inputs uncoordinated

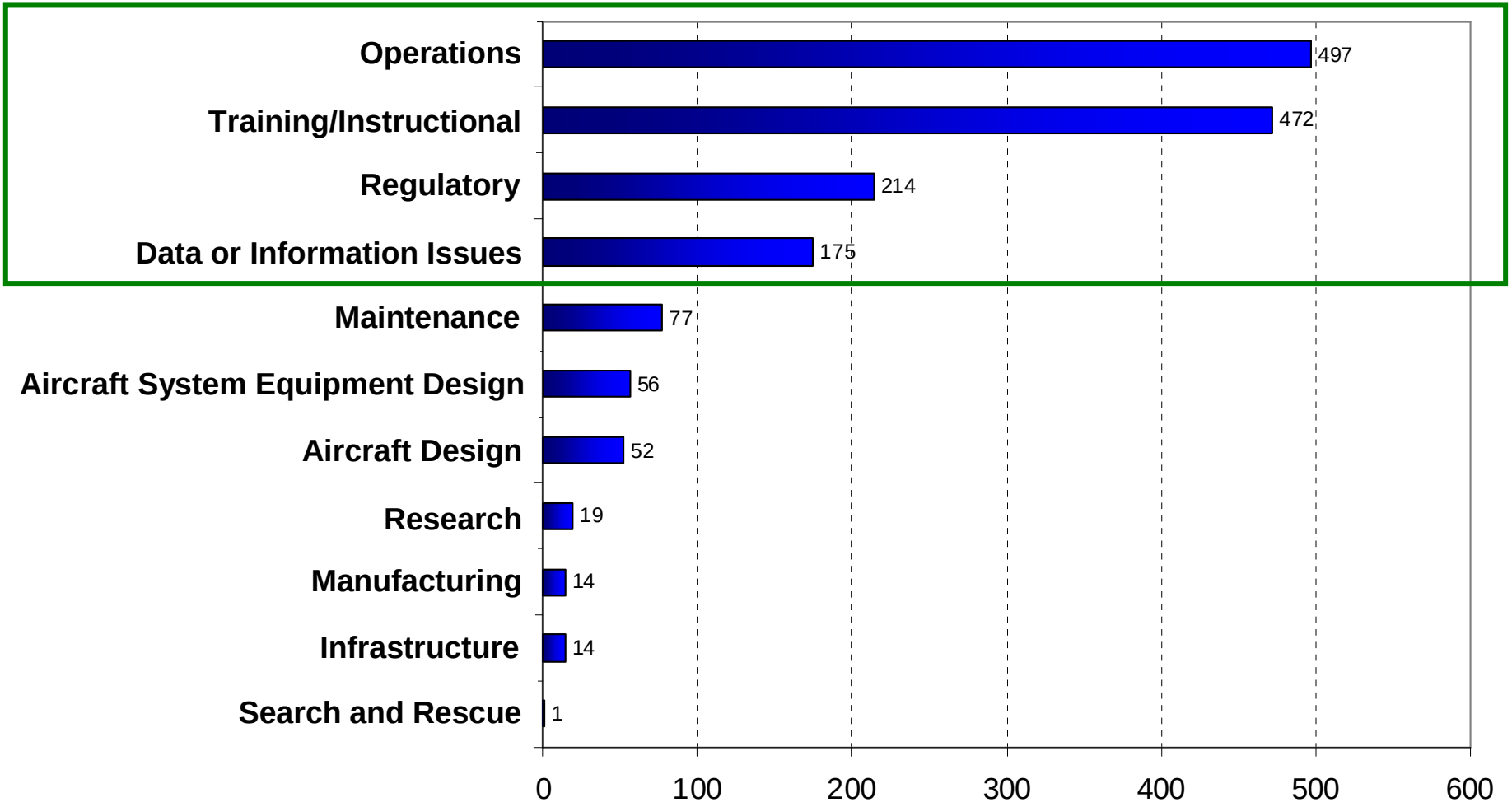
The flight instructor interacted too late

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)



Specialist Teams on SMS/Operations and on Training

- Intervention recommendations aggregated and consolidated by the EHSIT

- And handed over to Specialist Teams tasked to develop safety enhancements
  - ST SMS / Operations
  - ST Training

Specialist Team SMS/Operations

- Consolidated recommendations:
  - SMS: Encourage the use of SMS based on real safety culture including risk management and codes of practice.
  - 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

IHST Toolkits

- Freely accessible on: www.ihst.org

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Concluding remarks

- European wide analysis results produced by 11 regional teams
- Work continues within EHSIT:
  - STs on SMS / Operations and Training
  - Next ST will address Regulatory matters
- Attention on communication with stakeholders
  - EHEST Website and Newsletter
  - EHEST Communications Sub-Group established
    - Liaising with EGAST (common challenges)
- Continued cooperation within IHST

EHEST

Component of ESSI

European Helicopter Safety Team

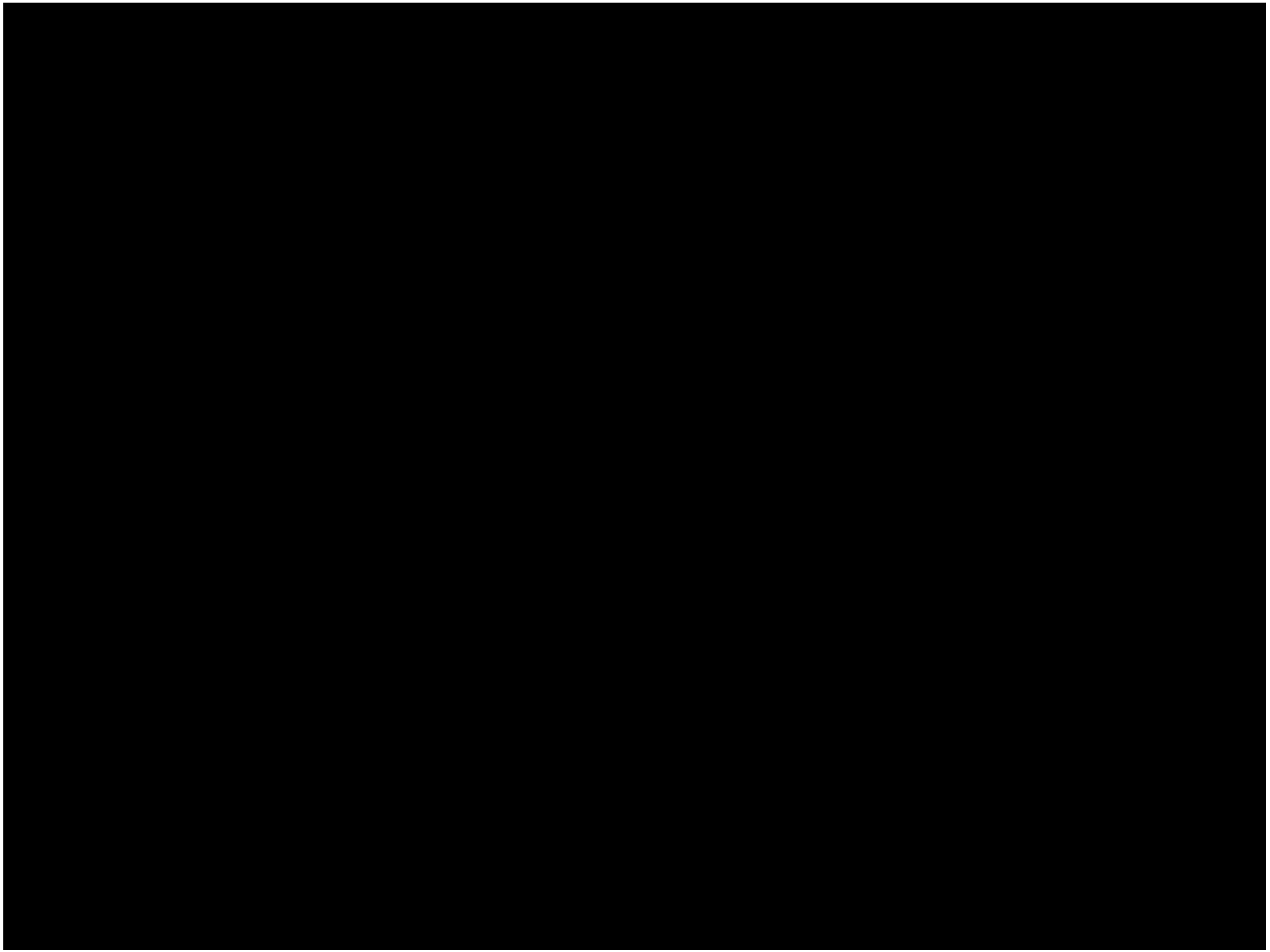
The challenge now is to develop, implement and monitor effective measures to meet the 80% accident rate reduction target

Thank you for your attention

Questions?

To join the initiative:
ehest@easa.europa.eu

Photos AgustaWestland and Eurocopter



Annex

Number of Helicopter Accidents per Year

EASA MS Registered, CAT+AeW+GA

Source: EASA Annual Safety Review