

A photograph taken from the perspective of a pilot inside a helicopter cockpit. The view is through the windshield, showing a river valley with a winding river, green fields, and distant hills under a clear blue sky. The cockpit's instrument panel, featuring several analog gauges and a central display, is visible in the lower-left foreground. The title text is overlaid in the upper-middle section of the image.


AIRMANSHIP UND SITUATIONAL AWARENESS (SA) IN HELICOPTER OPERATIONS

8th EASA Rotorcraft Symposium, Köln
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Agenda

- Introduction
 - Definitions & Theories
 - Case Study / Accident Analysis
 - Conclusions
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Airmanship & SA

- What is it?
- How does it affect human thinking and behaviour?
- How can it be related to accidents?
- Can it be trained?



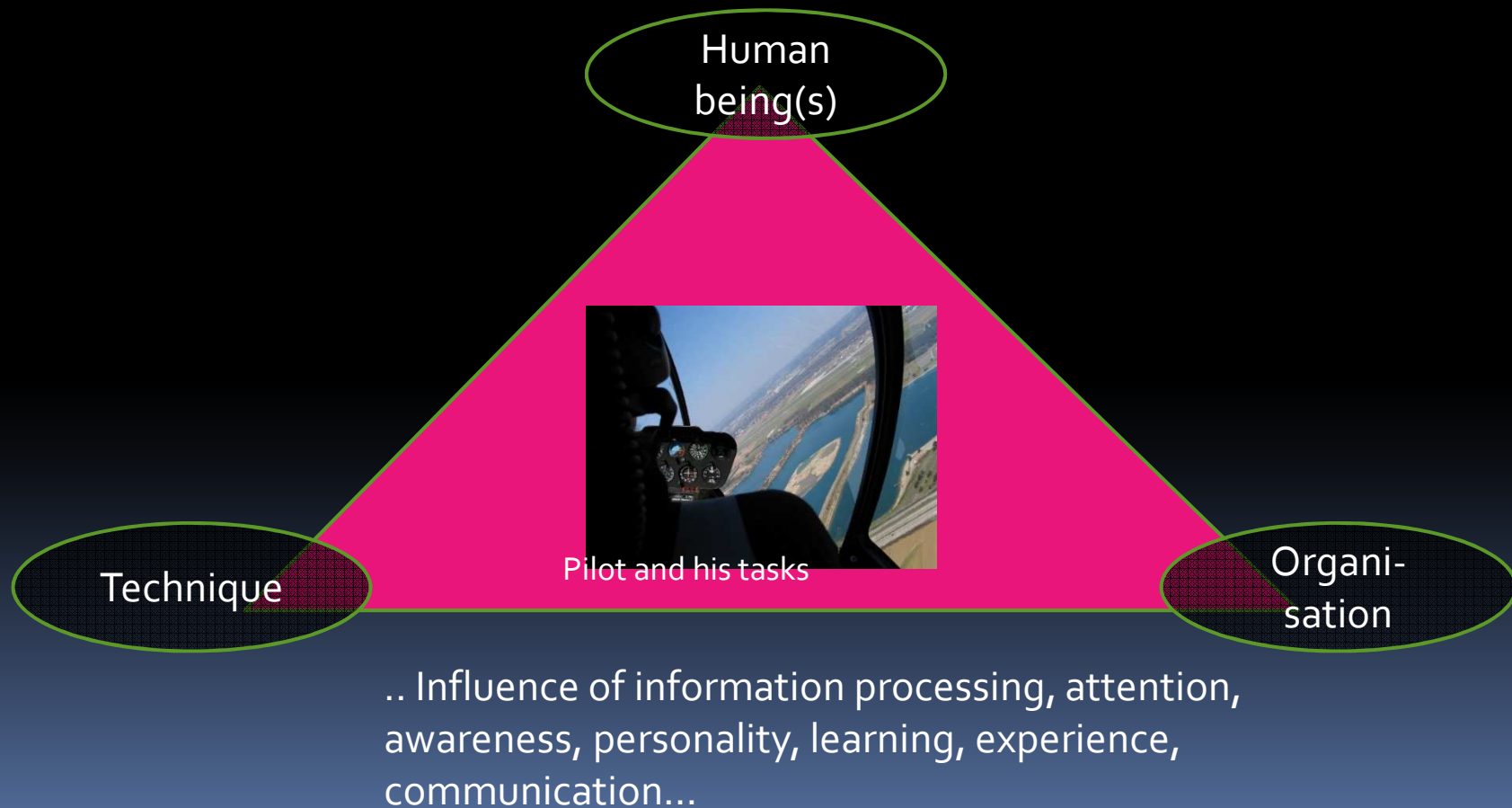
Some statistics: EHEST Analysis of Accidents

- Analysis of helicopter accidents across Europe
- 311 accidents until march 2010
- Among the top 3 reasons for accidents:
 - Pilot judgement & actions
 - Ground duties, e.g. flight preparation

**-> Helicopter
Airmanship**



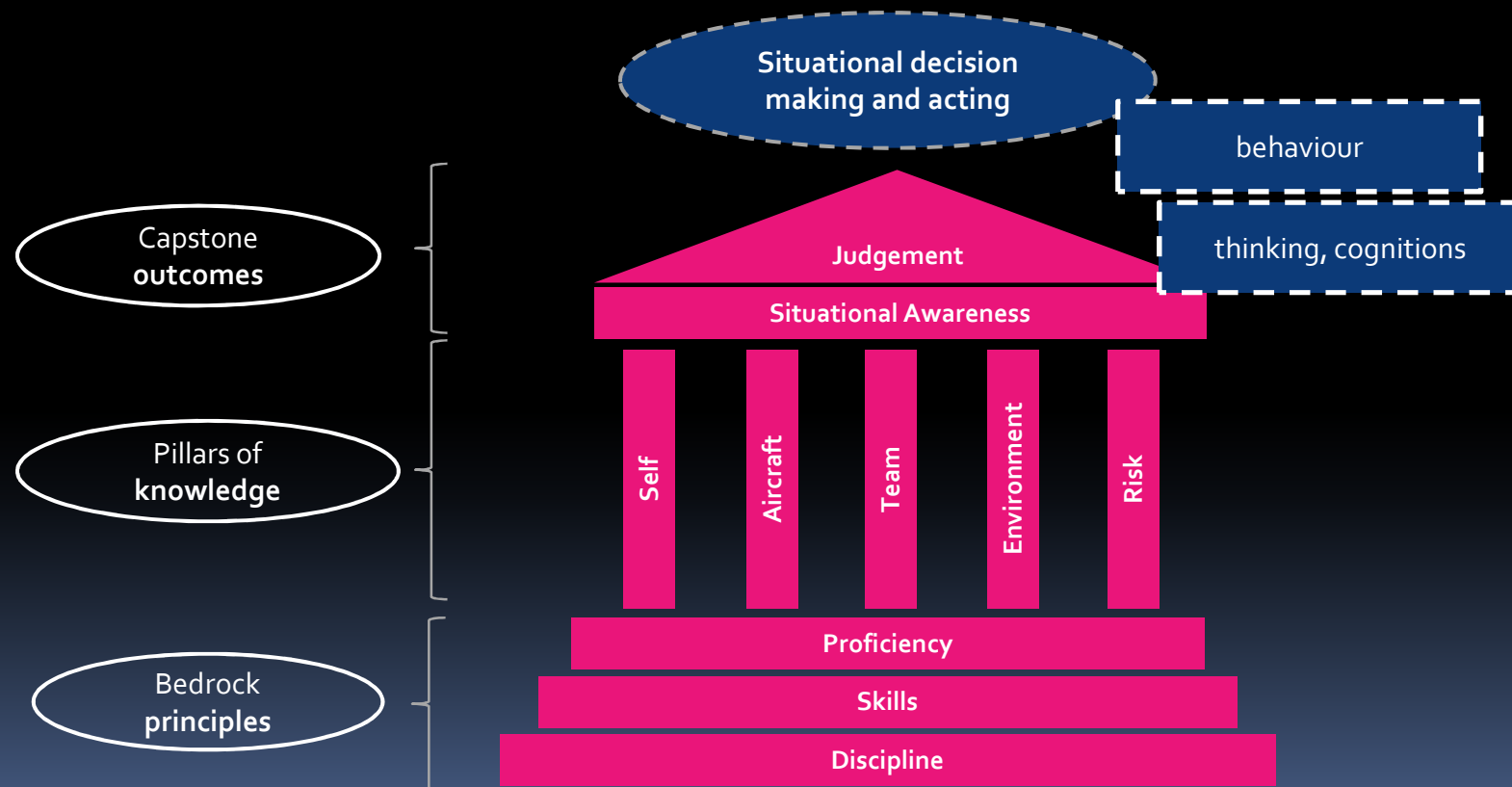
Reasons and areas for accidents



Some definitions

- Airmanship:
 - ▣ The consistent use of good judgement and well developed skills to accomplish flight objectives (ICAO)

A Model for Airmanship (Kern, 2009)

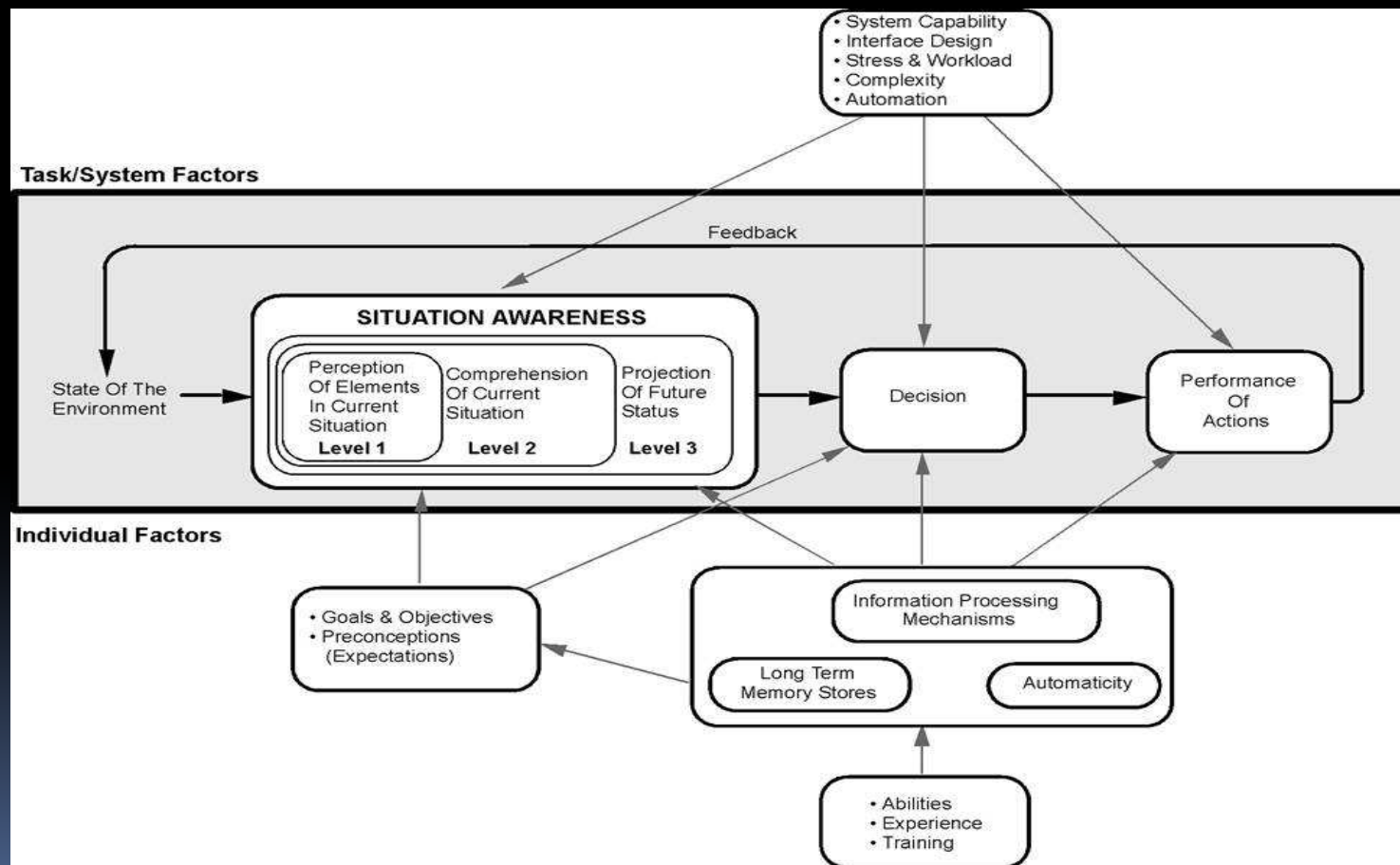


Source: Civil Aviation Authority 2009 „Safety Behaviours“, aus Kern, Tony

Situational awareness (SA)

- SA is the accurate perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future. (Endsley, 1988)
- Situational assessment -> situational awareness
- Mental model

Model for situational awareness (Endsley, 1995)



Case study / Accident analysis

- All data are based on the BFU report (in german) by A. Rokohl
- Source: http://www.bfu-web.de/DE/Publikationen/Untersuchungsberichte/2013/Bericht_13_3X001_R44_A6-Schwaebisch-Hall.pdf?__blob=publicationFile

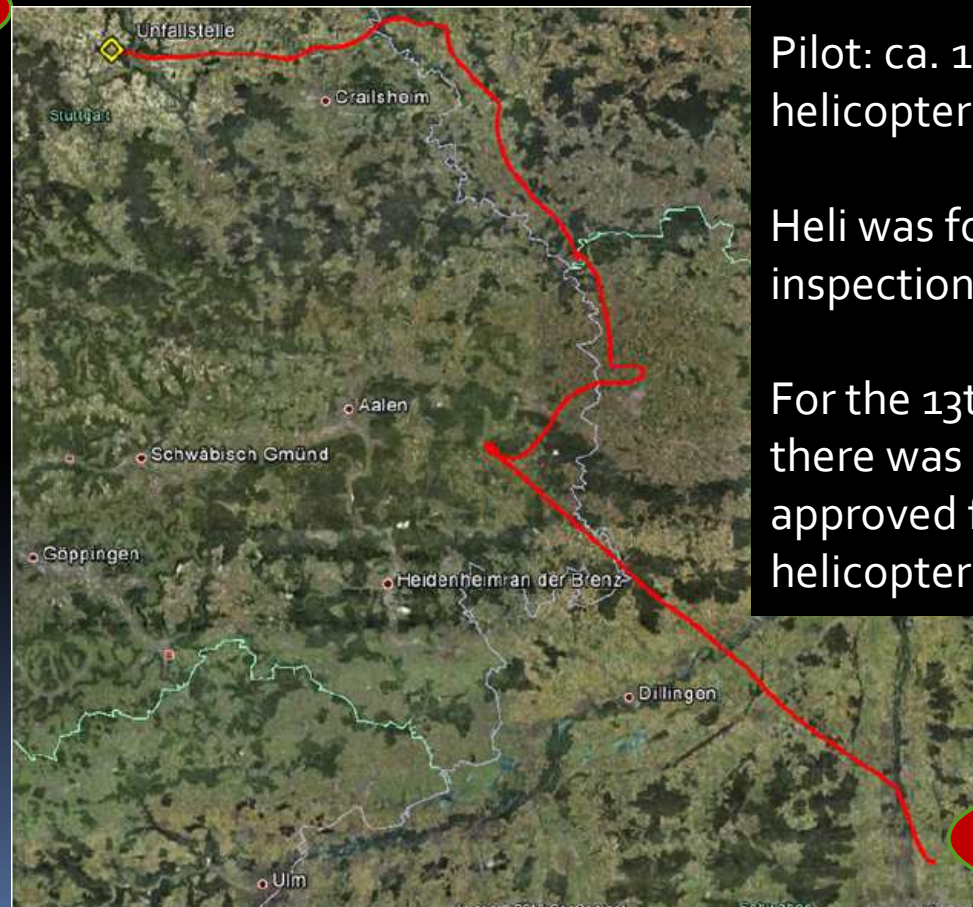
Flight path: R44 Astro, one person on board

10th of January 2013

Heilbronn /
Langenbrettach

Collision with
powerline
approx. 30 km
before planned
landing spot at
16:38 (Sunset
16:45)

166 km distance
between start in
Augsburg and
accident



Pilot: ca. 127 hrs on
helicopter experience

Heli was for the annual
inspection in Augsburg

For the 13th of January
there was a flight event
approved for the
helicopter

Augsburg

Background I

Official weather
GAFOR: x-ray, fog,
deep stratus clouds

- After start direct heading to Langenbrettach (intended landing spot), 300 ft AGL
- Probably due to deteriorating weather conditions at Bopfingen/Wallerstein change of course, along B25 („bad weather route“), mostly less than 200 ft AGL, average speed 100 kts

Background II

- Flight into wire (24 m AGL high) across the highway A6 with ca. 95 kts
- Witnesses: heli high between 20 and 100 m AGL, weather: foggy, hazy, dusky, „Sauwetter“, visibility range between 100 and 200 m
- Pilot knew about the bad weather: several appeals in Augsburg not to start and to stay overnight

Background III & Options

- Manufacturer Robinson
 - SN-18: loss of visibility can be fatal: You must take corrective action before visibility is lost.
 - SN-16: Power lines are deadly
- Why not an unplanned safety landing (§25 Luftverkehrsgesetz)?
- Why not a „no flight“ decision?

Factors that may have influenced SA of the pilot

- Fatigue and/or stress -> tunnel vision
- work load too low or too high
- Press on regardless
- Stick to a once decided plan
- Get-there (home)-itis
- Earlier experiences
- Confirmation bias
- No self discipline, no plan B? Plan C?
- Illusory optimism (I came so far now..)
-

Airmanship

How to train Airmanship and SA? I

- Addressing SA issues, e.g. „what if“ re/flight planning
- Holistic competency oriented training_
Helicopter flying is more than knowing how to fly a helicopter...
- To generally raise the students awareness
- Using of material that addresses AMS an SA
- Train systems / taxonomies
- Scenario techniques / Simulation

How to train Airmanship and SA? II

- Model learning, mentoring
- Involve student from the beginning on in planning, decisions, concerns re/all phases of a flight through **thinking aloud**
- Common flights: practice good CRM and prepare the student for his solo flights (-> Single Ressource Mgmt)
- For every flight hour: Briefing with goals, Debriefing e.g. with questioning of decisions during flight, what went good, what went bad..

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