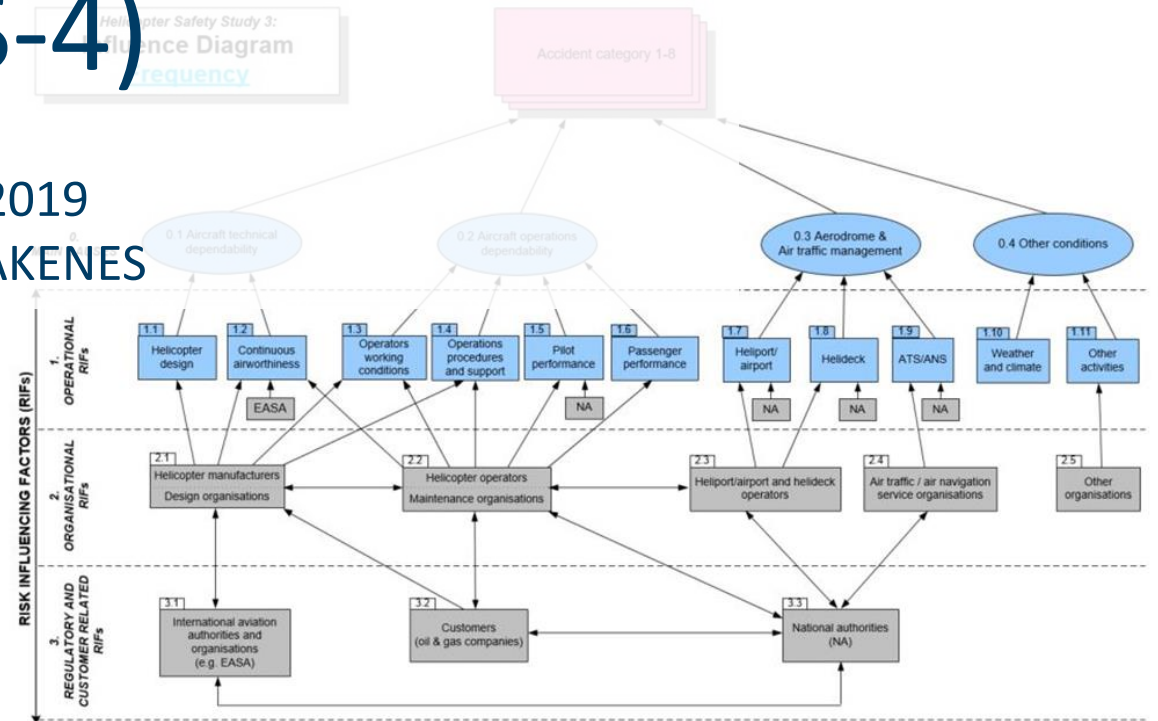


HELICOPTER SAFETY STUDY 4 (HSS-4)

17.09.2019

TONY KRÅKENES

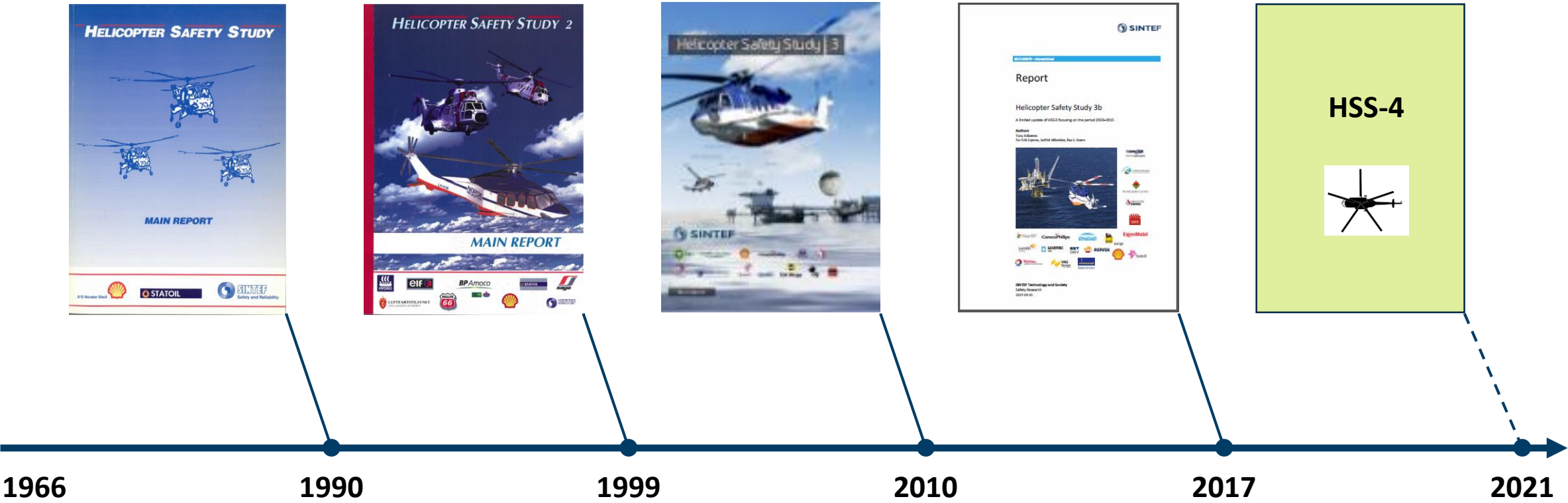


Content

- HSS history
- About HSS-4
- HSS-4 activities
- Relevance of the HSS studies



HSS history



Previous HSS studies – at a glance



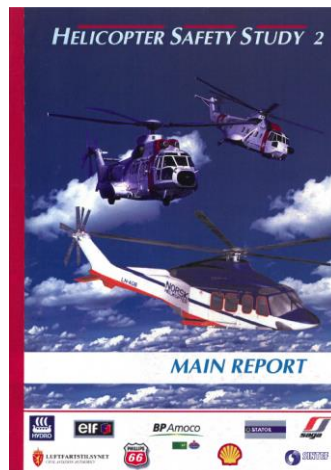
HSS-1

- 1966–1990
- 2 sponsors
- Important topics:
 - Risk modelling
 - Risk contributors



HSS-3

- 1999–2009
- 10 sponsors
- Important topics:
 - Risk level
 - Perceived risk
 - Safety indicators
 - Suggested measures



HSS-2

- 1990–1998
- 8 sponsors
- Important topics:
 - Risk modelling
 - Risk contributors
 - Risk level



HSS-3b

- 2010–2015/16
- 16 sponsors
- Important topics:
 - Recent accidents
 - CAP 1145 assessment
 - HOFO regulations
 - Suggested measures

HSS-4 in numbers

2 years

March 2019 – March 2021

4 000 manhours

7 study activities

4 research partners

SINTEF, NTNU, Imperial, Brim

12 researchers

22 sponsors

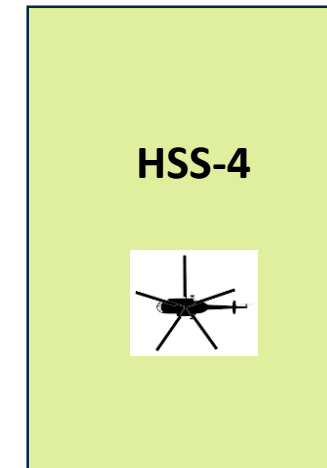
15 O&G companies

2 national authorities

2 trade unions

2 helicopter companies

1 service provider



Sponsors and supporters

O&G sponsors (15)



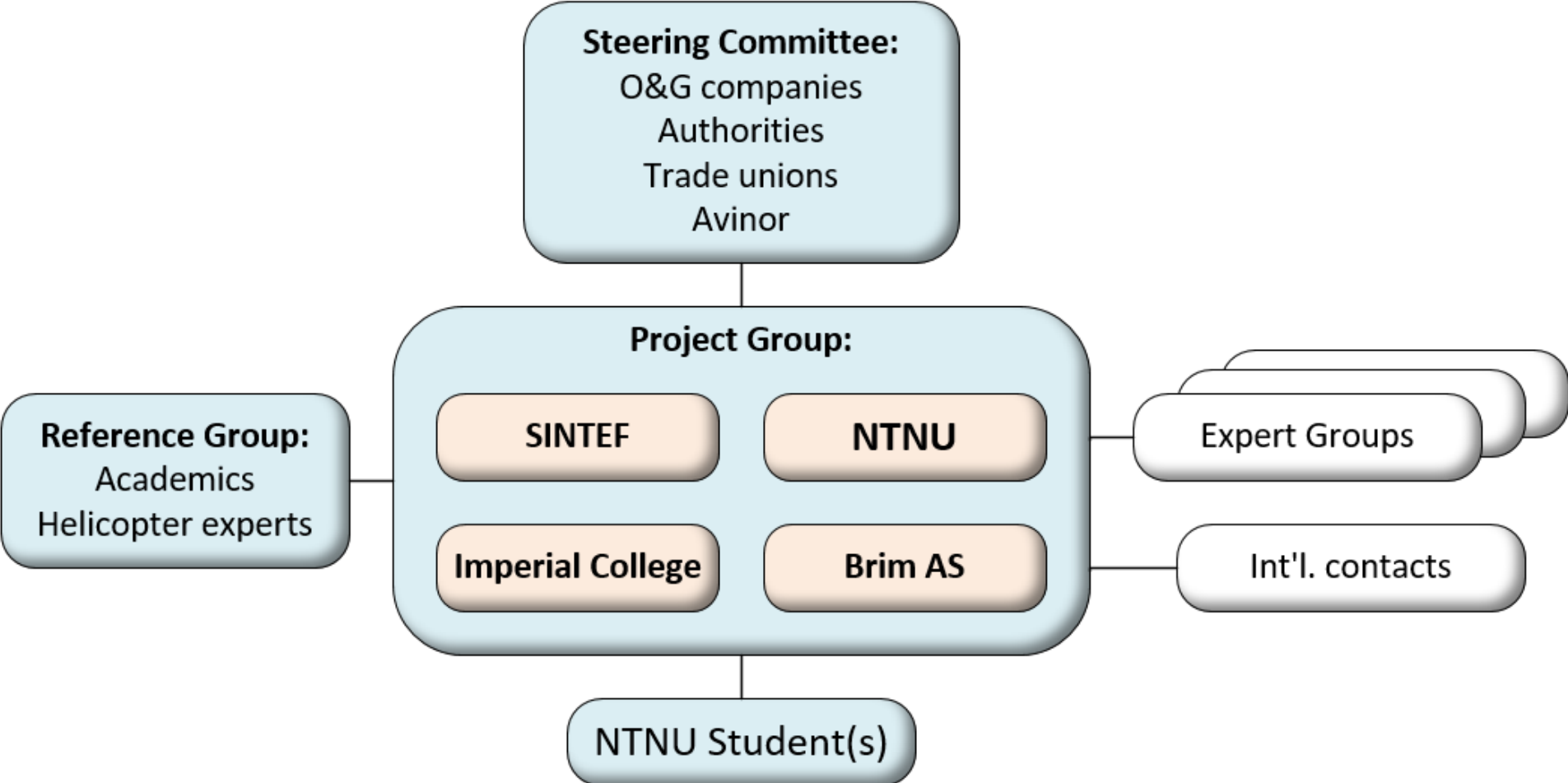
Other sponsors (7)



Supporters (3)



Project organisation



Study activities

1. Industry developments in the period 2010–2020 (and ahead)
2. Statistics, accidents and risk level
3. HSS model development
4. Comparison of helicopter safety in the NO and UK sector
5. Resilience in practice
6. Identification and prioritisation of safety measures
7. "Living HSS"

Activity 1:

Industry developments



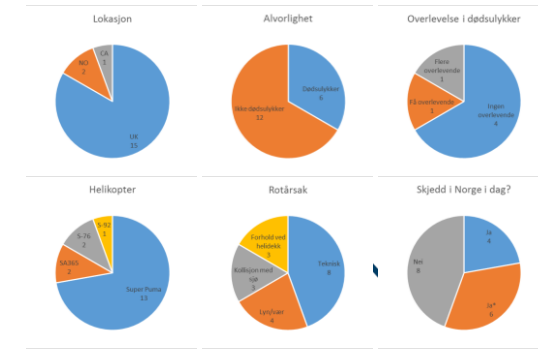
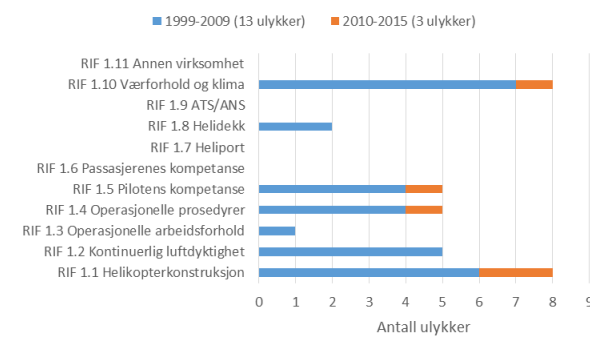
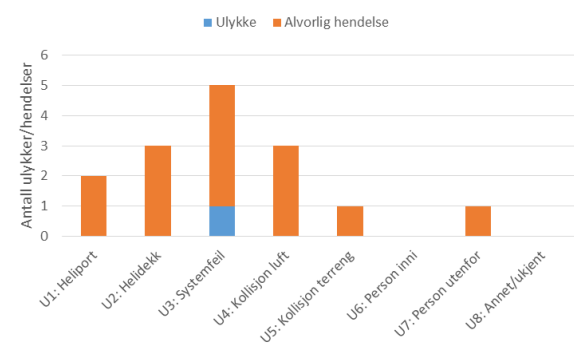
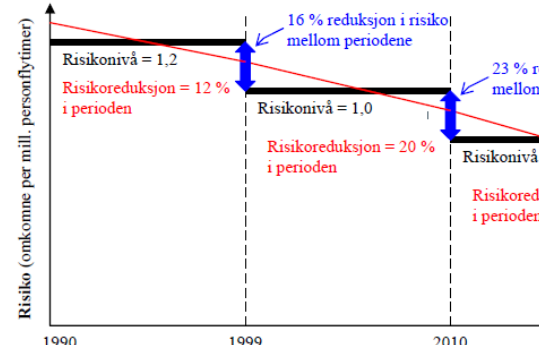
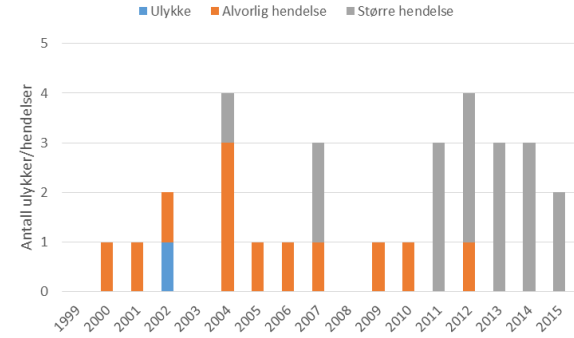
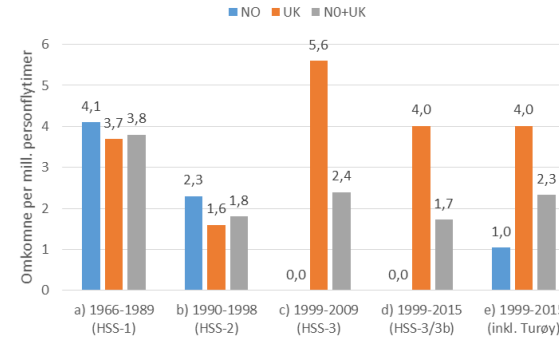
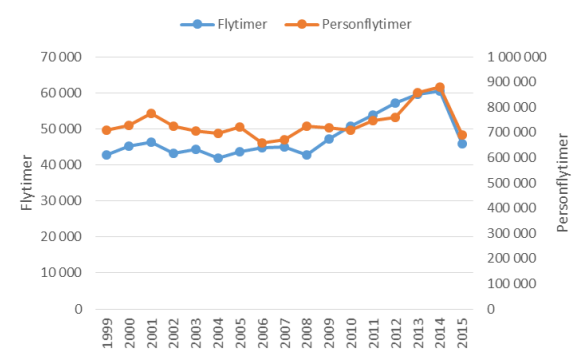
- Technological, operative, ATM, organisational, regulatory, emergency preparedness
- Specific challenges ahead: High north, digitalisation, drones, etc.
- Approach:
 - Document study
 - Interviews with key stakeholders
 - Analysis using safety theoretical perspectives
- Output: A comprehensive description of main developments in the last 10 years and ahead

Activity 2:

Statistics, accidents and risk level

- Content:
 - a) Statistics on accidents, incidents and traffic
 - b) Analysis of recent accidents
 - c) Quantification of risk
- Output: Quantitative descriptions and analyses based on the HSS model

Example diagrams from HSS-3/3b

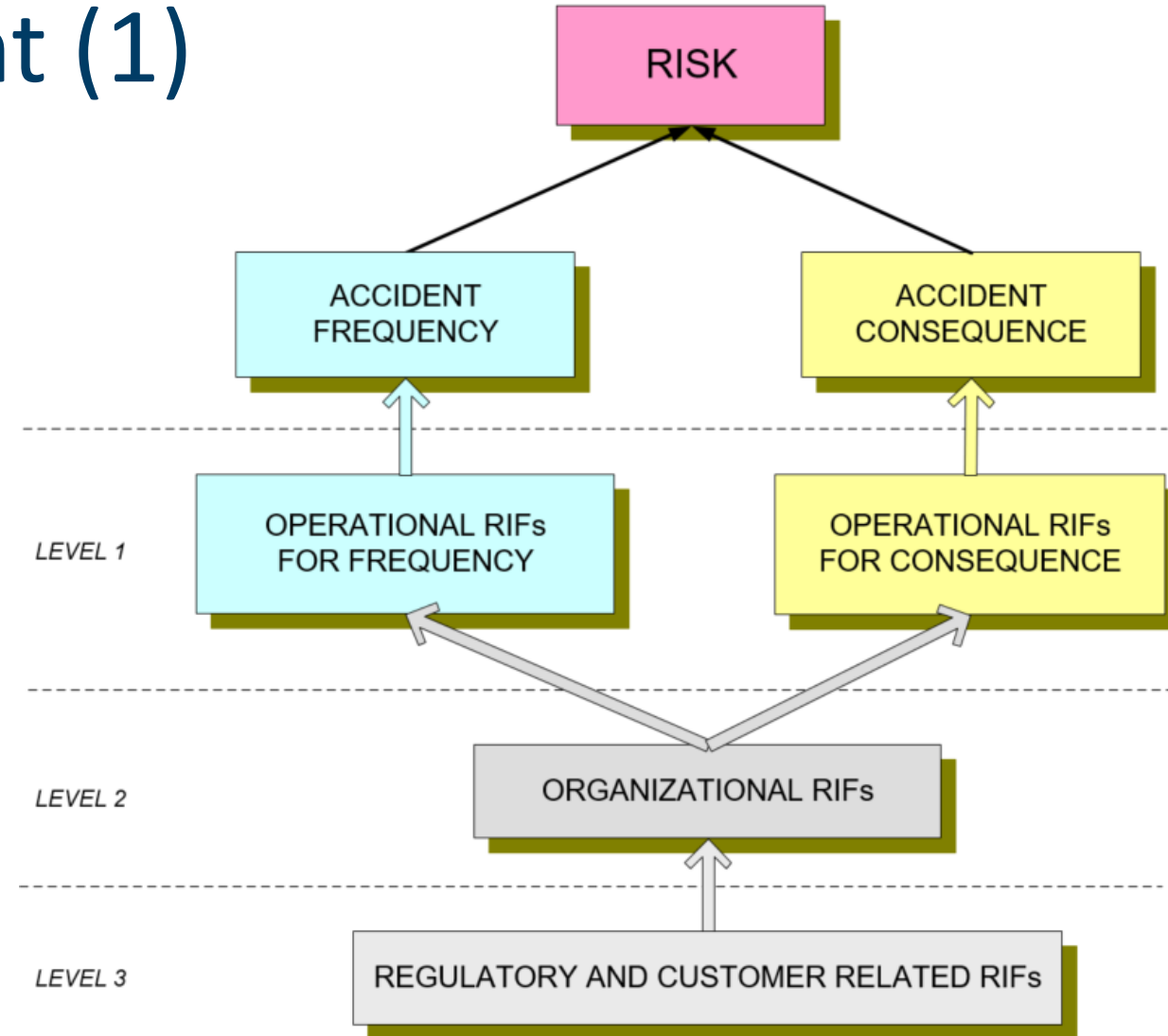


Activity 3:

HSS model development (1)

The HSS model features a set of risk influencing factors (RIFs) and is used to:

- Identify important risk contributors
- Identify important accident categories
- Structure expert workshops
- Structure results by topic
- Quantify risk and risk change
- Assess the effect of safety measures and prioritise between measures



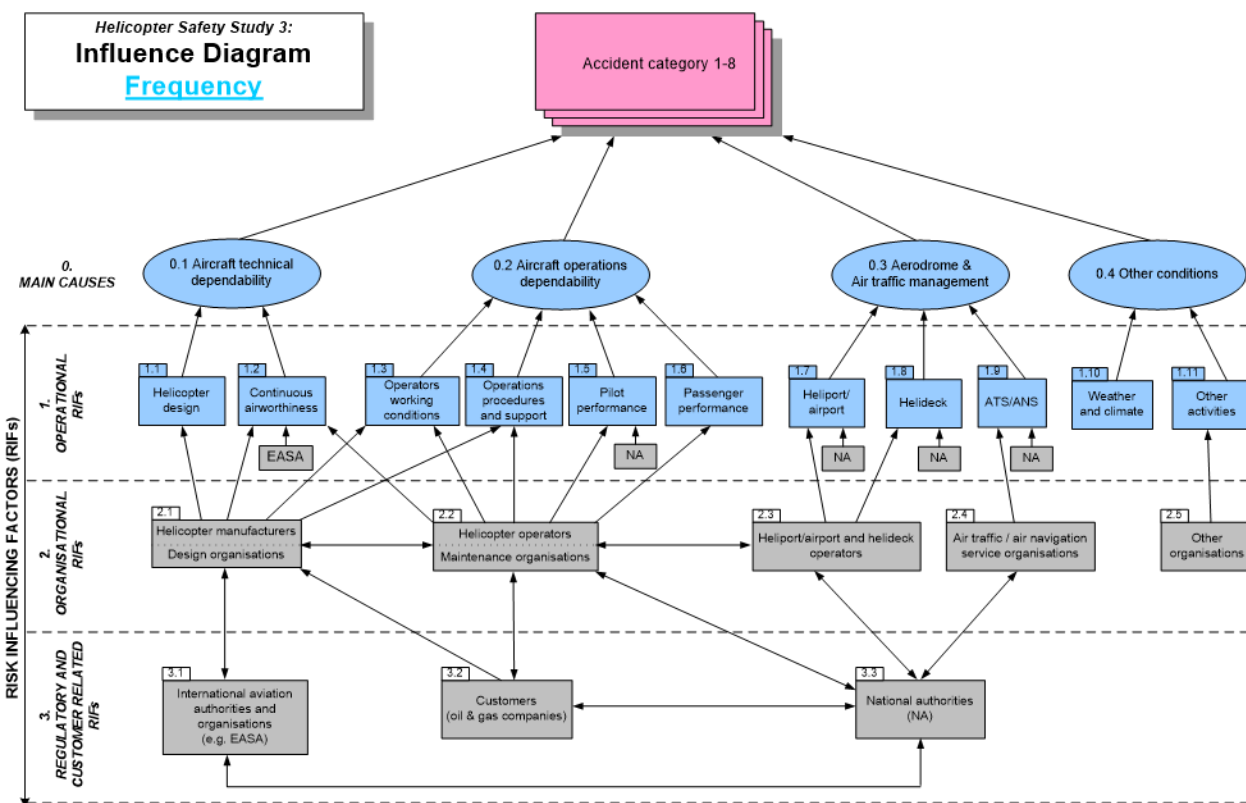
Model from HSS-3/3b

Activity 3:

HSS model development (2)

Ambitions for further development:

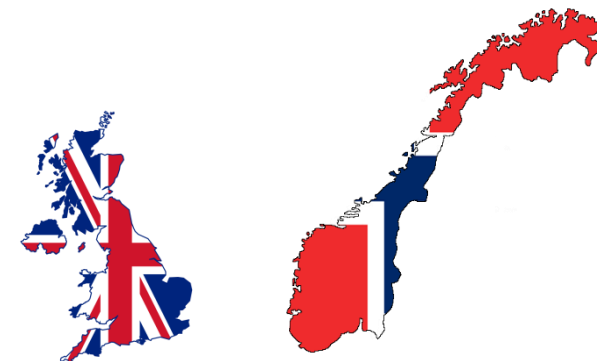
- Revision of existing model structure
- Accident categories
- Risk influencing factors
- Explicit on safety functions and barriers
- Possible operationalisation of resilience
- Uncertainty modelling
- New data basis (incident data)



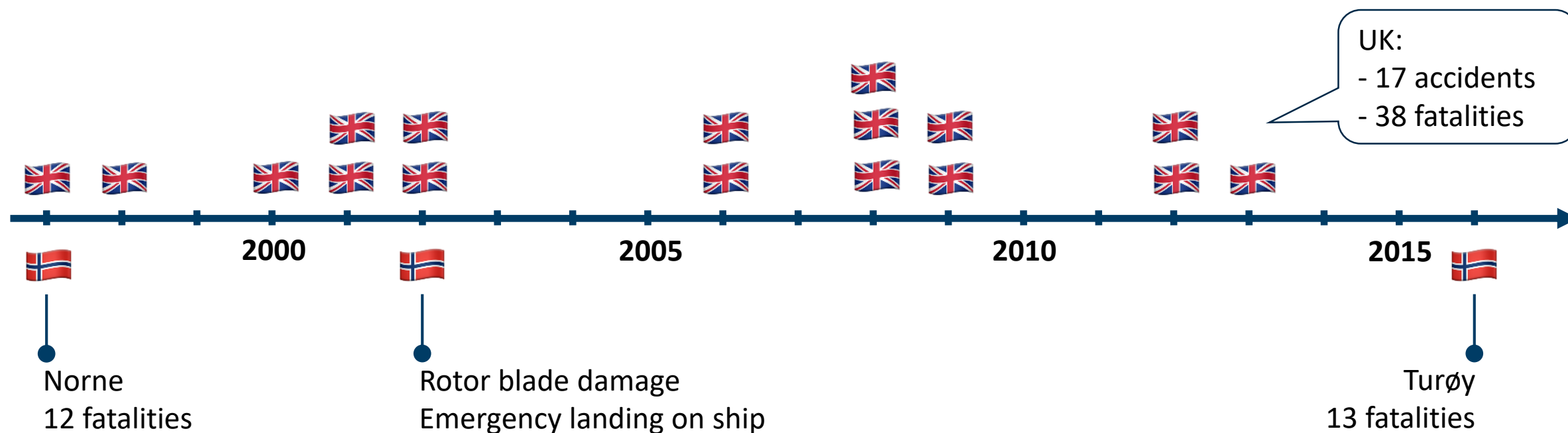
Model from HSS-3/3b

Activity 4:

Comparison NO–UK (1)



Comparative study of helicopter safety in the NO and UK sectors



Activity 4:

Comparison NO–UK (2)

Background:

- A comparison study was recommended in both HSS-3 and HSS-3b
- Many apparent similarities – and many anecdotes of differences
- Not documented in previous studies

Ambition:

- Identify and describe similarities and differences
- Identify points of learning between the sectors



Activity 4:

Comparison NO–UK (3)

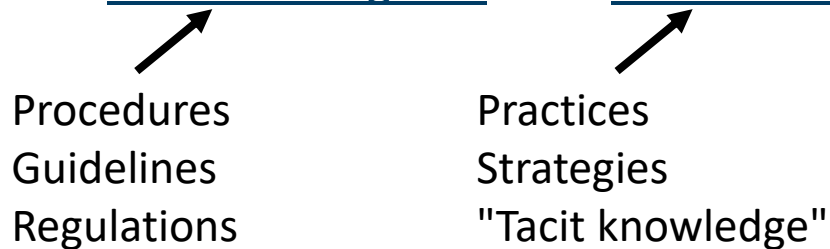
Study themes:

- Comparable **statistics** related to accident/incident data, traffic volume/patterns and operational conditions (e.g. weather)
- European and national **regulations**, i.e. the formal framework conditions impacting safety
- **Industry structure and roles** of organisations: helicopter operators, O&G companies, unions, authorities, training and maintenance organisations
- **Technology** in use: helicopter types and age, types of usage, available equipment, maintenance routines
- Industry **working conditions** (contracts, workload, pay, environmental factors, etc.)
- The role of **culture** and **work as done**, including safety culture and reporting practices
- How the sectors **work to handle safety** – e.g. safety forums, follow-up of safety recommendations

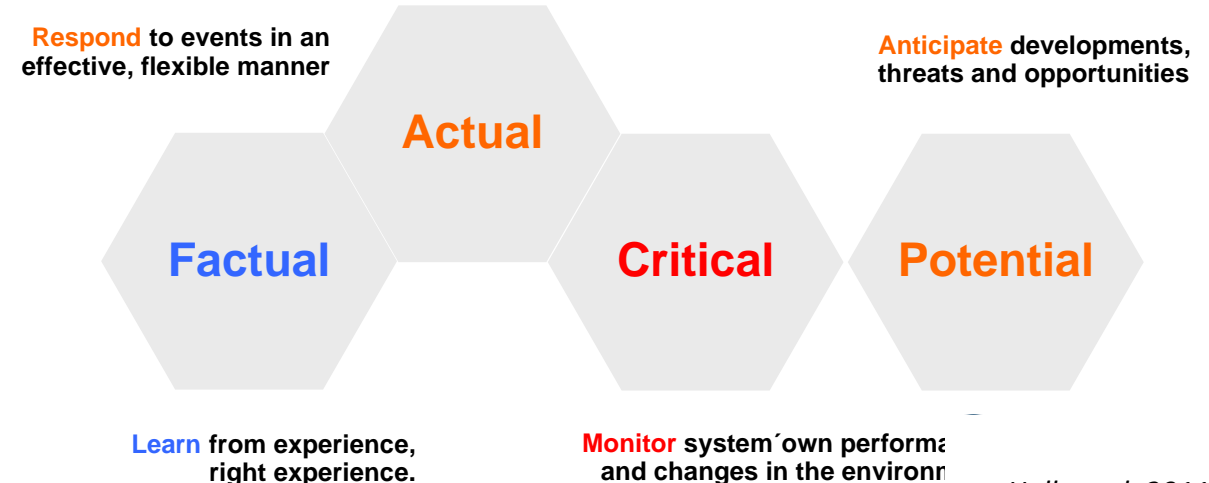
Activity 5:

Resilience in practice

- Increased complexity, uncertainty and limitation of resources calls for *resilience*
- **Resilience** is the ability of systems and organizations to continue operations both under expected and unexpected conditions (changes, disturbances, opportunities)
- Case studies to reveal sources of resilience and gaps between "work as imagined" vs. "work as done"



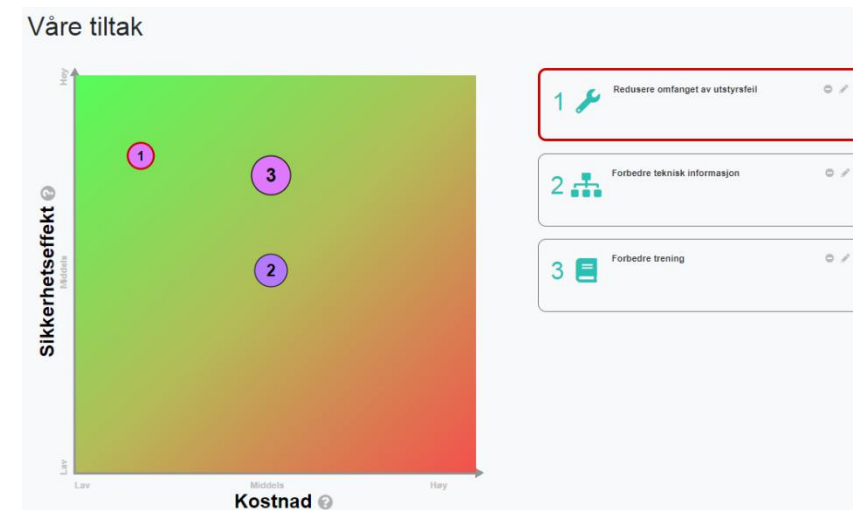
- Output: Practices, strategies and recommendations to enhance resilient performance



Activity 6:

Identification/prioritisation of safety measures

- The study activities give input to the identification and analysis of possible safety measures (risk-reducing or safety-promoting)
- Safety measures previously proposed in HSS-3/3b will be reassessed; some are implemented, some are in progress, some are irrelevant
- Cost-benefit assessment of safety measures
 - The HSS model is used to quantify "benefit" (i.e. risk reduction)
 - A digital tool for analysis and visualisation of cost-benefit of safety measures is developed and used in expert meetings
 - The tool can also be used during follow-up of safety measures (post study)

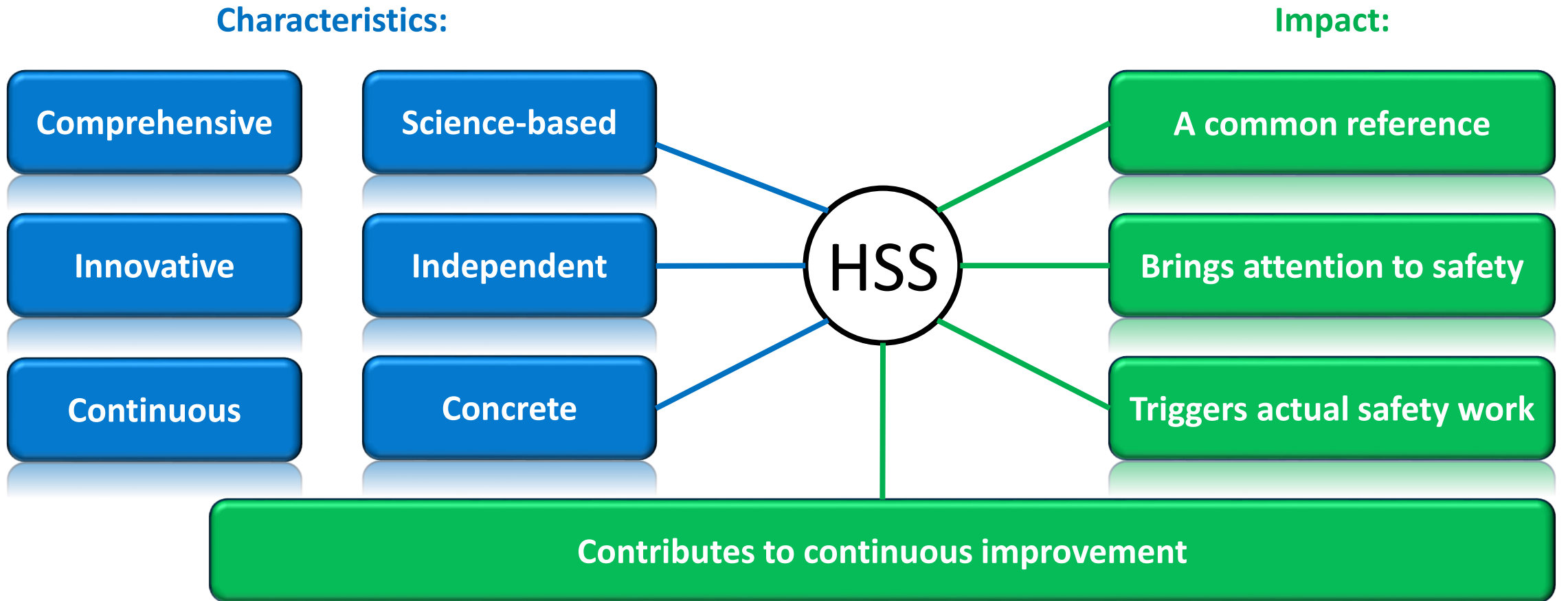


Activity 7:

"Living HSS"

- The final report is also delivered as a web resource
- Assessment of the potential of further development and use of such a digital solution
 - Continuous updating of e.g. developments, incidents, statistics, risk level, work with safety measures, etc.
 - Digitized, interactive HSS model
 - Visualisation of risk contribution and effect of safety measures
- Possible to learn and draw inspiration from fixed-wing and other domains

Relevance of the HSS studies



Do the HSS studies have the right focus?

- The short answer is "**we believe so**", based on
 - The qualities of the studies
 - The impact in the industry
 - The contribution to continuous improvement
- However, there is always room for improvement!
 - 10 year pause between studies seems too long
 - "Living HSS" is an attempt to remedy this

The small steps taken towards continuous improvement, is a major contributor to all those accidents ... NOT happening.

Questions?

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