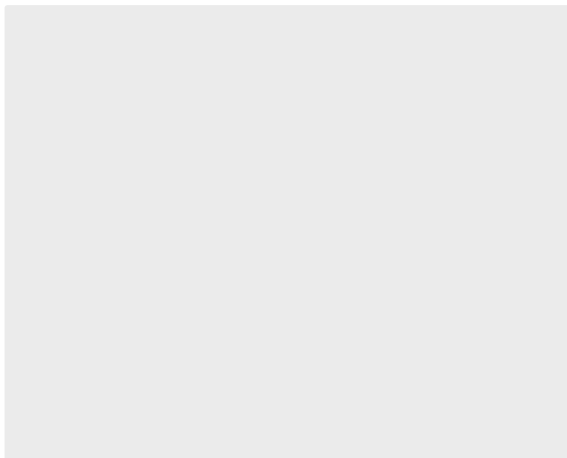




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Investigating Human Factors

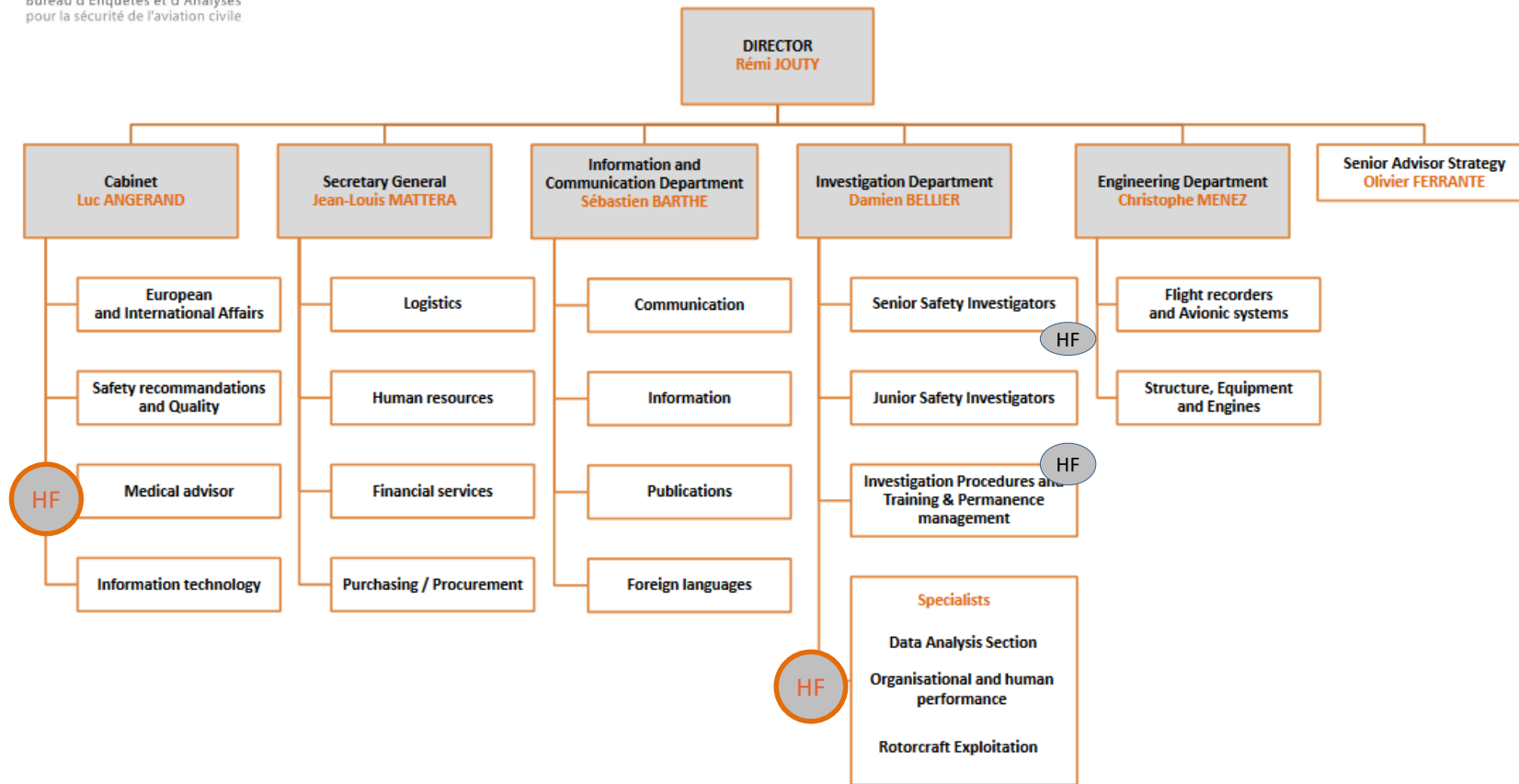
Fanny Rome
Safety Investigator – Human Factors & Ergonomics, BEA

member
of the
network



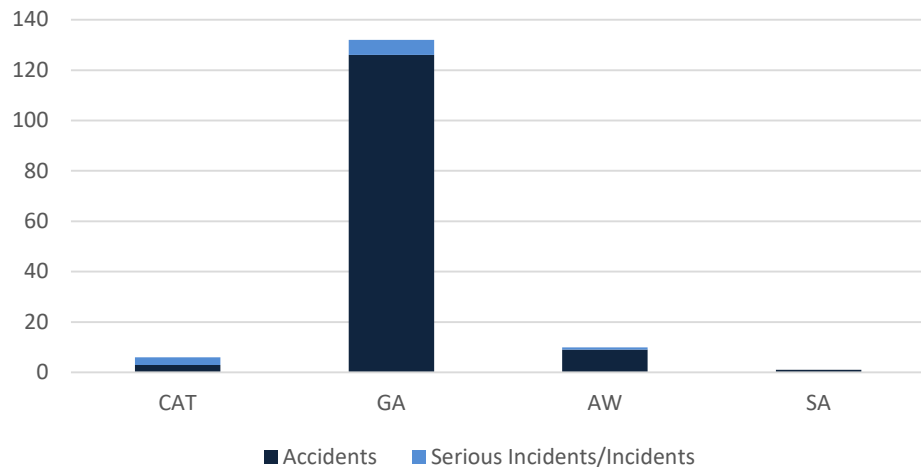
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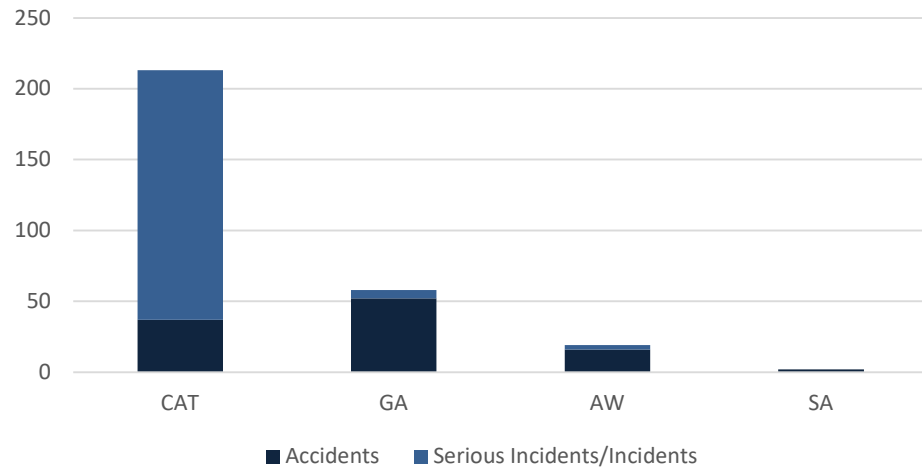


Investigations in 2018

Investigations initiated by BEA in 2018



Accrep in 2018



- Well defined for major events

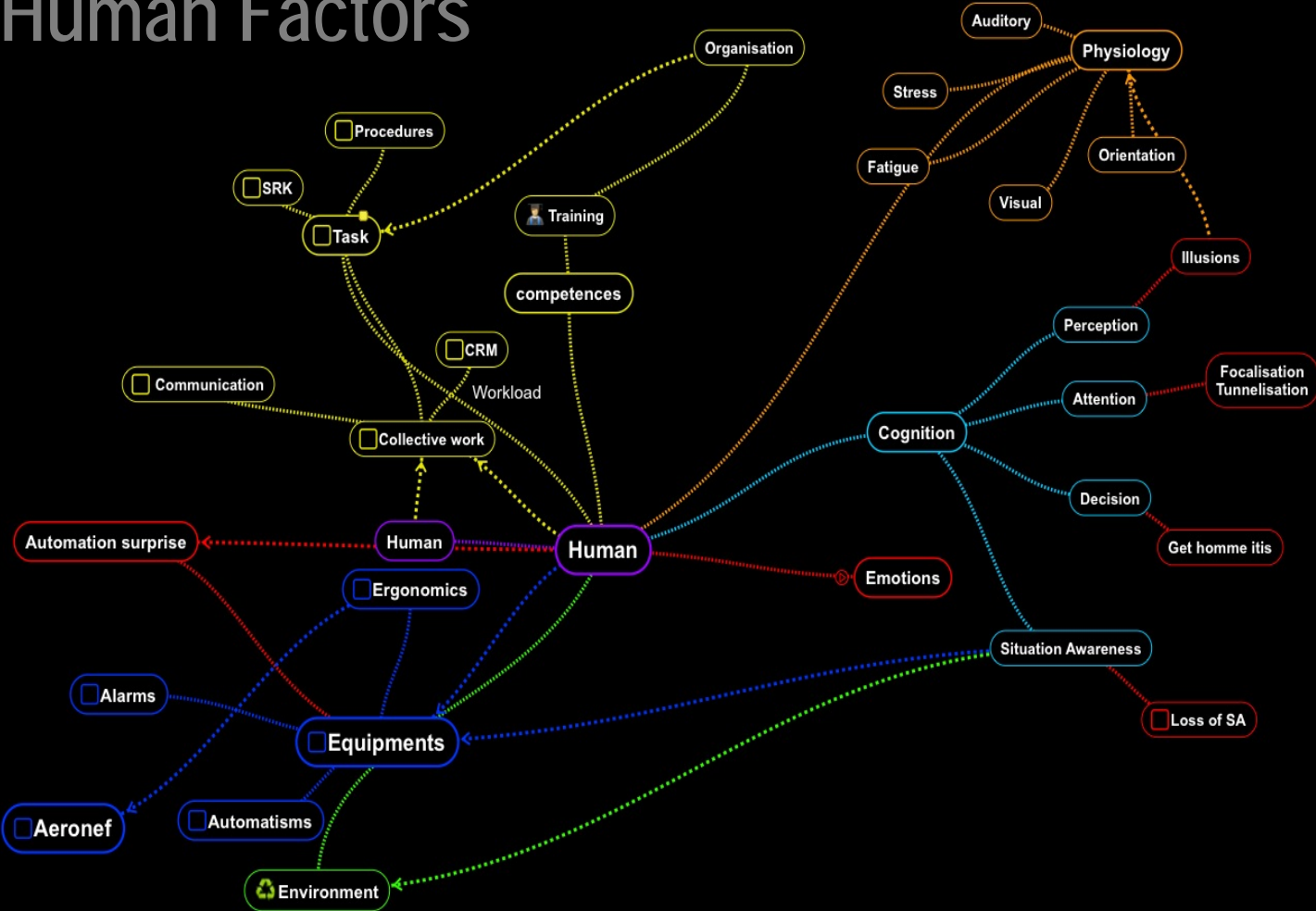
AIRCRAFT	SYSTEMS	OPERATIONS
- Site / Wreckage	- Flight recorders	- Flight operations
- Structure	- Aircraft performance	- Meteorology
- Engines	- On-board systems	- Air Navigation and Aerodromes
- Maintenance		- Survival



- Human and Organisational factors addressed in a cross-functional manner
- Possible creation of specific groups according to needs

- Less defined for general aviation
 - Adaptability to volume, time, available data....

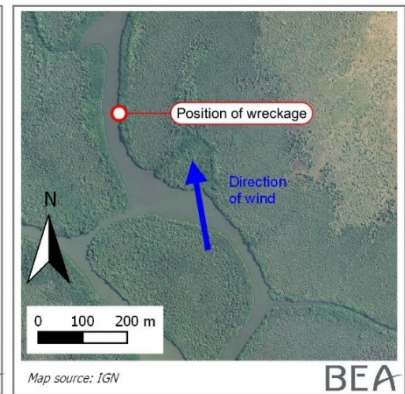
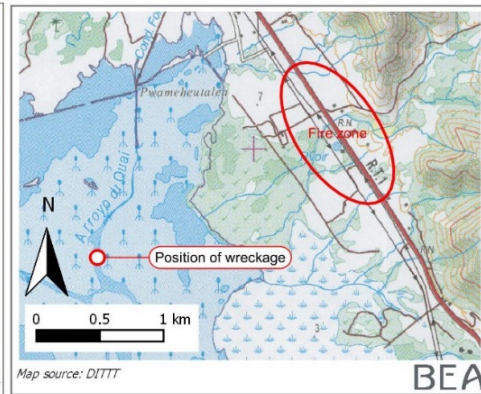
Scope of Human Factors



Some recent requests

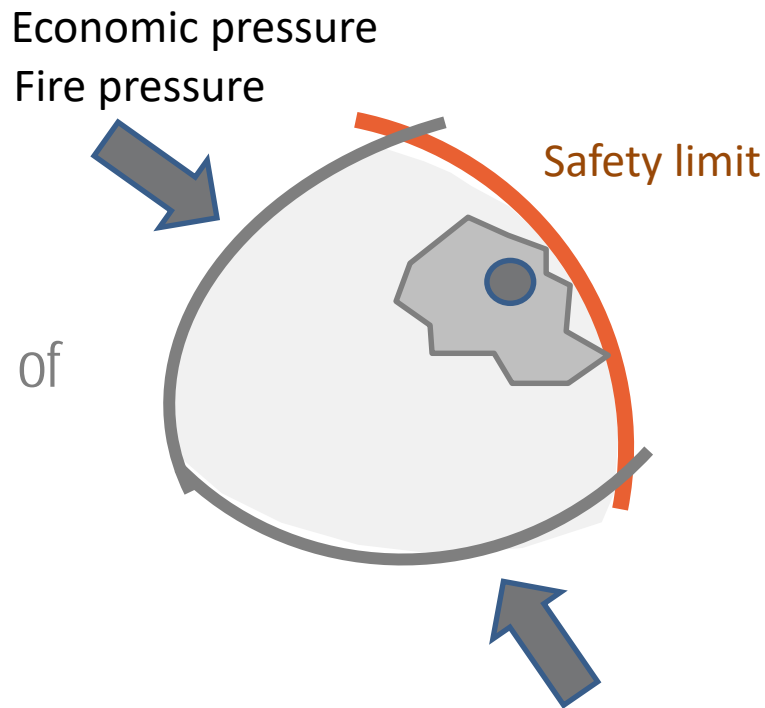
- Can a pilot distinguish a rotation rate at takeoff of $2^{\circ}/s$ Vs $3^{\circ}/s$?
- Does the fact that the firefighting helicopter pilot is a woman have an impact?
- How can we analyse the crew performance in the approach?

- Initial request on HF : ~~Does the fact that the pilot is a woman have an impact?~~



- Reword the question : Did the pilot experience/feel any pressure doing her job?

- Work analysis of Firefighting activity,
 - Management of amount of fuel,
 - Consideration of wind limits,
 - Choice of scooping area, ...
- Very near the safety limits, management of margins by **experience**
- Experience of the pilot
 - CAT Vs Aerial Work experience
 - First flights in firefighting

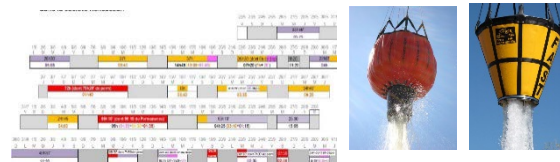


Helicopter Performance calculation...

- Period of rapid development for the company
 - Workload : Fatigue (chronic)
 - Training : No supervision on actual fires
- Determination to succeed in a new job

➔ Individual and collective pressure

➤ 7 safety recommendations (regulatory framework / competence in aerial work, duty hours, training, assistance...)



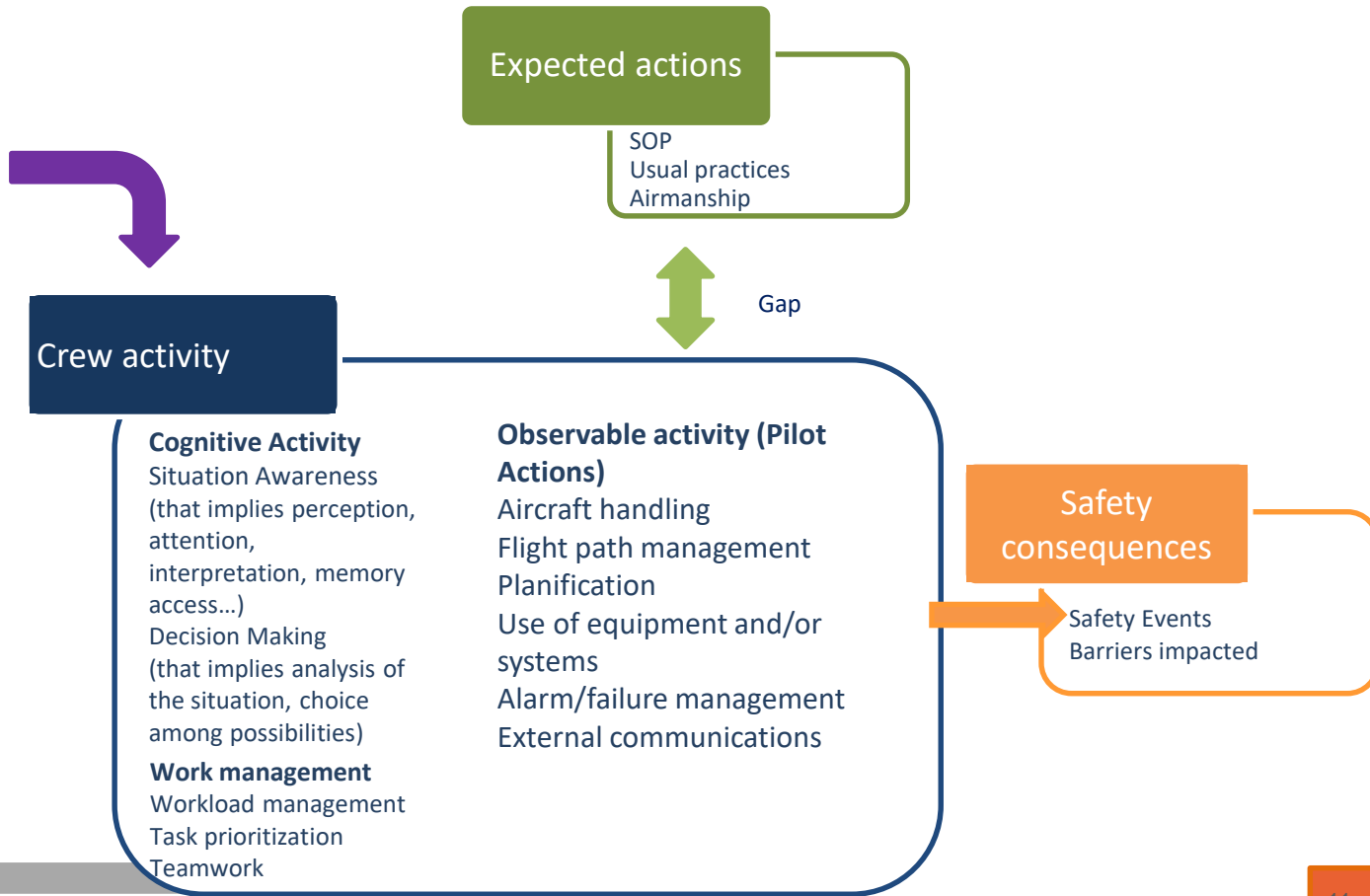
Some recent requests

- Can a pilot distinguish a rotation rate at takeoff of $2^\circ /s$ Vs $3^\circ /s$?
- Did the pilot experience/feel any pressure doing her job?
- How can we analyse the crew performance in the approach?
 - Serious incident in France, with two go-arounds and a third chaotic approach

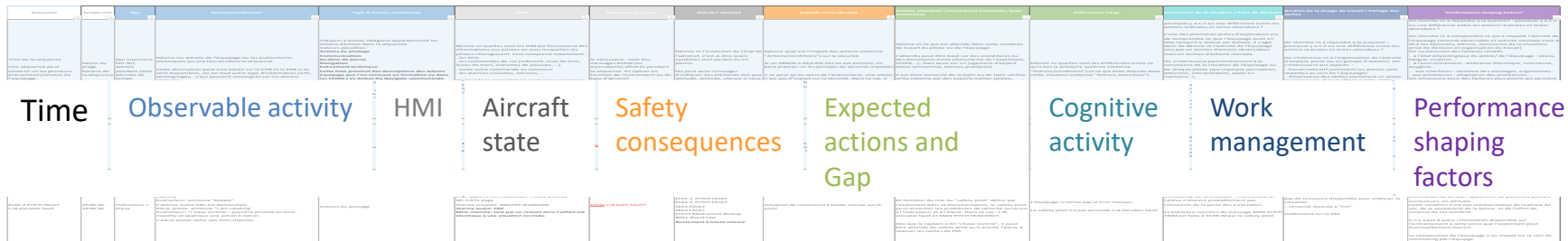
Crew Performance Model

Performance shaping Factors

- Environment:** warmth, light, oxygen, etc.
- Individual:** physiological condition of pilot/crew: stress, fatigue, surprise, etc.
- Operational constraints:** commercial, flight objectives, interactions with ATC, OPS, station
- Organisation** - Procedures: adaptation of procedures
 - Practical & theoretical training
 - Airline culture, etc.
- HMI:** - Salience of messages,
 - Ergonomics



■ Analysis Chart




- Lost of confidence in aircraft systems by the crew throughout the Flight Vs the current aircraft systems state

➤ Consensus, limiting biases and earlier integration

Conclusion on HF investigation

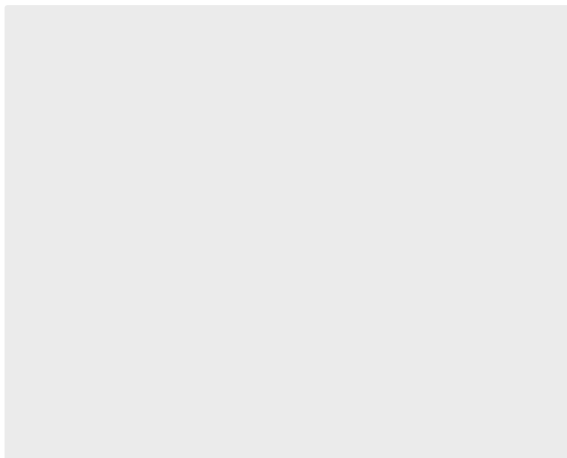
- + Several (interesting) HF themes investigated
- + Several reports and recommendations issued
- Integration in the investigation team mainly based on the good will of the IIC
- Often late in the process

- Development of Crew performance chart and integration with analysis methodology
- Intranet « Wiki » HOF 
- Training of junior investigators
- International collaboration with peers?



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Thanks for your attention