



GATE-TO-GATE SAFETY

**Improving aviation safety by better
understanding and handling of interfaces**

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Cooperative effort

Funding by

- Dutch Directorate General of Civil Aviation
- Dutch Civil Aviation Authority
- US Federal Aviation Administration

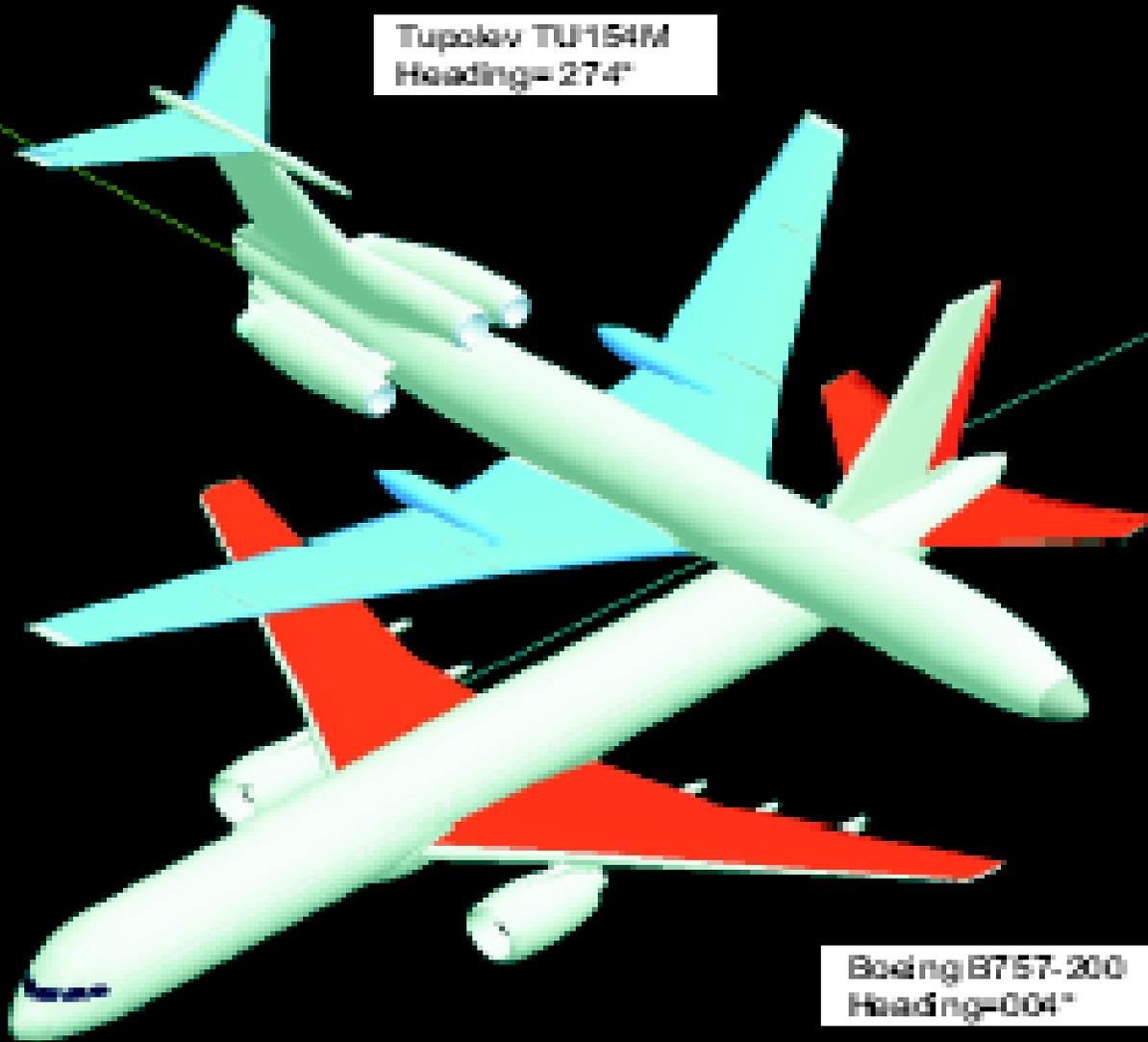


Definition of the problem

- **The aviation system is complex**
 - many different organisations
 - many different activities (processes)
 - constant information exchange between and within organisations
- **What if information exchange and co-operation does not run smoothly?**
- **Potential safety threat!**

Sky above Uberlingen, Germany 1 July 2002

Tupolev TU154M
Heading=274°



Boeing B757-200
Heading=004°

Boeing 737, Brisbane, Australia, 18 January 2001

- Aircraft encountered microburst windshear while conducting a go-around from runway 19 at Brisbane during an intense thunderstorm.
- “There was no effective mutual exchange of information between ATC and flight crew about the weather conditions at the airport.”

Boeing 737, VH-TJX, Brisbane, Australia, January 18, 2001

FedEx MD-11, Newark, 31 July 1997.

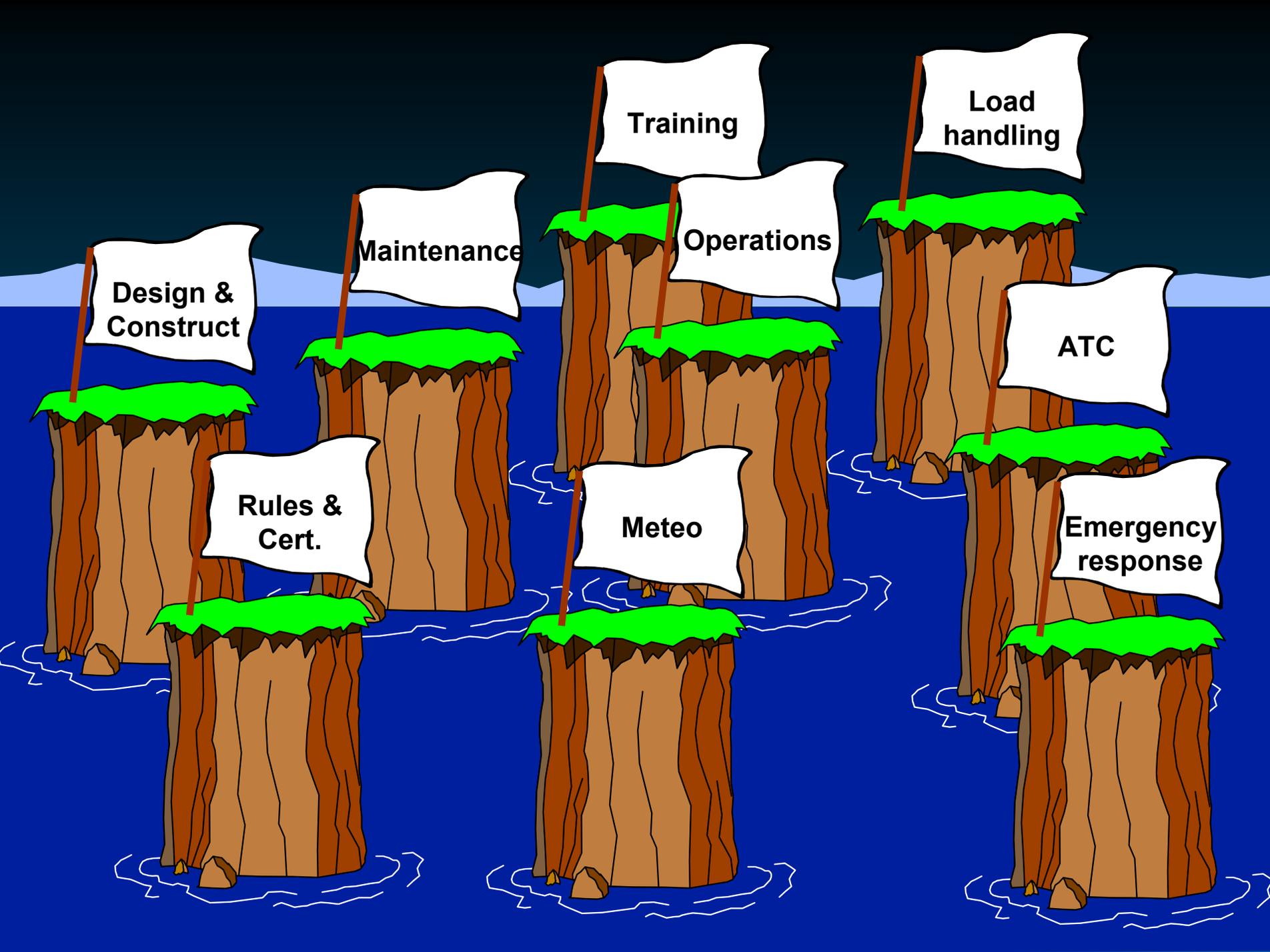
- Emergency response hampered because nobody seemed to know what cargo the aircraft was carrying.



Fine Air Douglas DC-8, 7 August 1997, Miami

- Exchange of aircraft was not communicated to the loaders.
- Accident aircraft was loaded according to instructions to a different aircraft.





**Design &
Construct**

**Rules &
Cert.**

Maintenance

Training

Operations

**Load
handling**

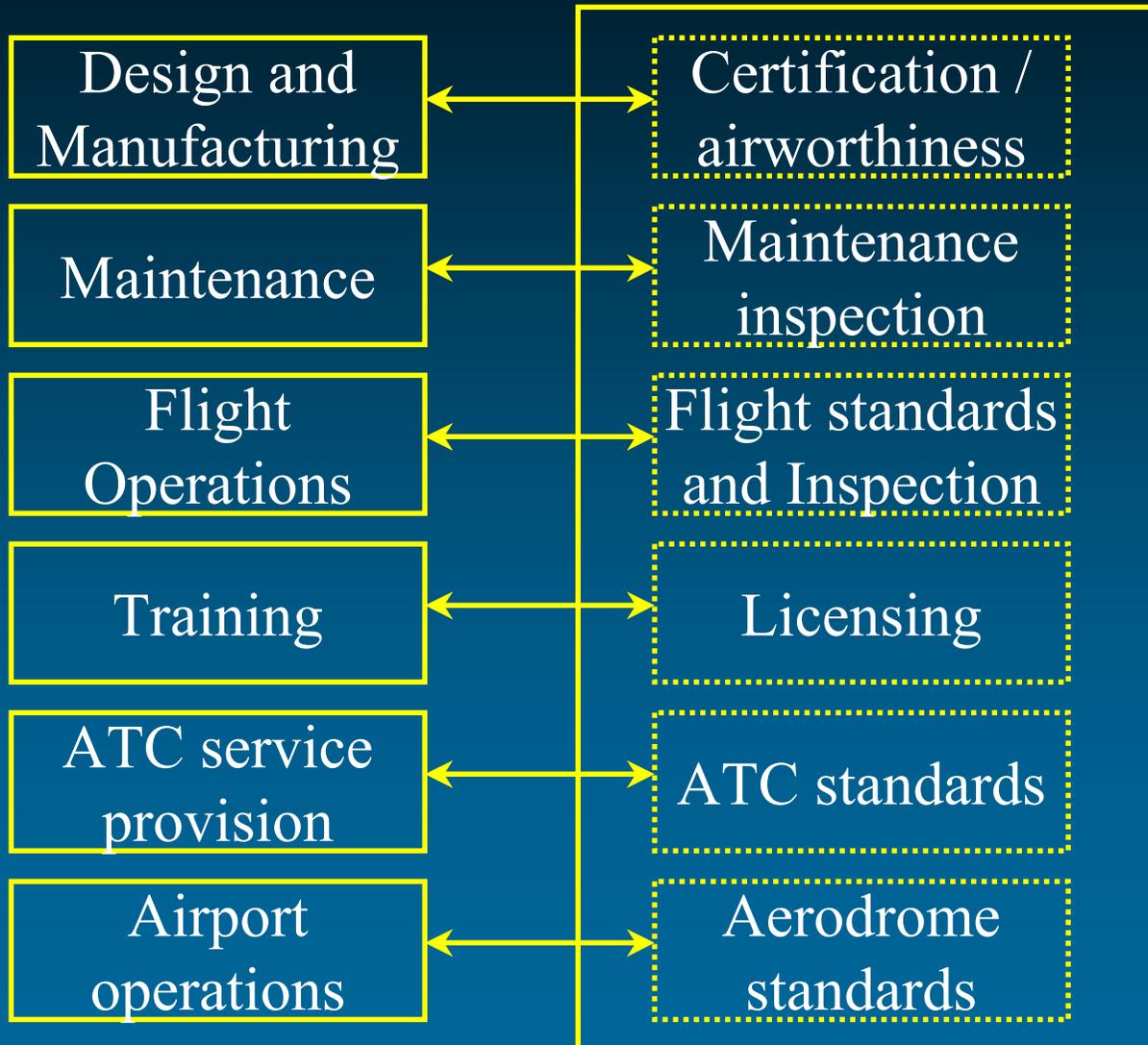
Meteo

ATC

**Emergency
response**

INDUSTRY

SAFETY OVERSIGHT



Pilot study

Objectives:

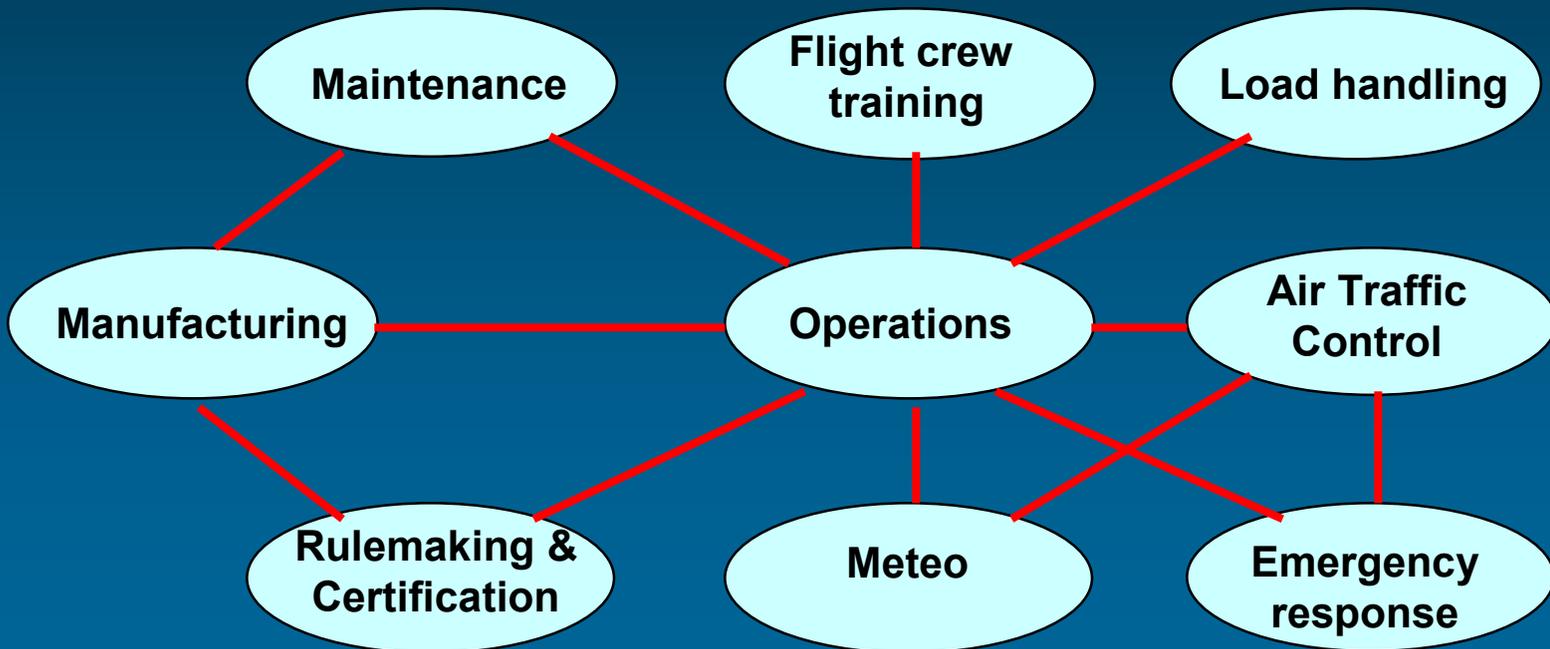
- Identify whether systematic analysis of interfaces can indeed lead to safety improvements.
- Identify main interface issues.

Means:

- Analysis of 54 accidents and incidents

Results Pilot Study

- Analysis confirms that interface problems contribute to accidents and incidents.
- Main interface disciplines and interfaces:

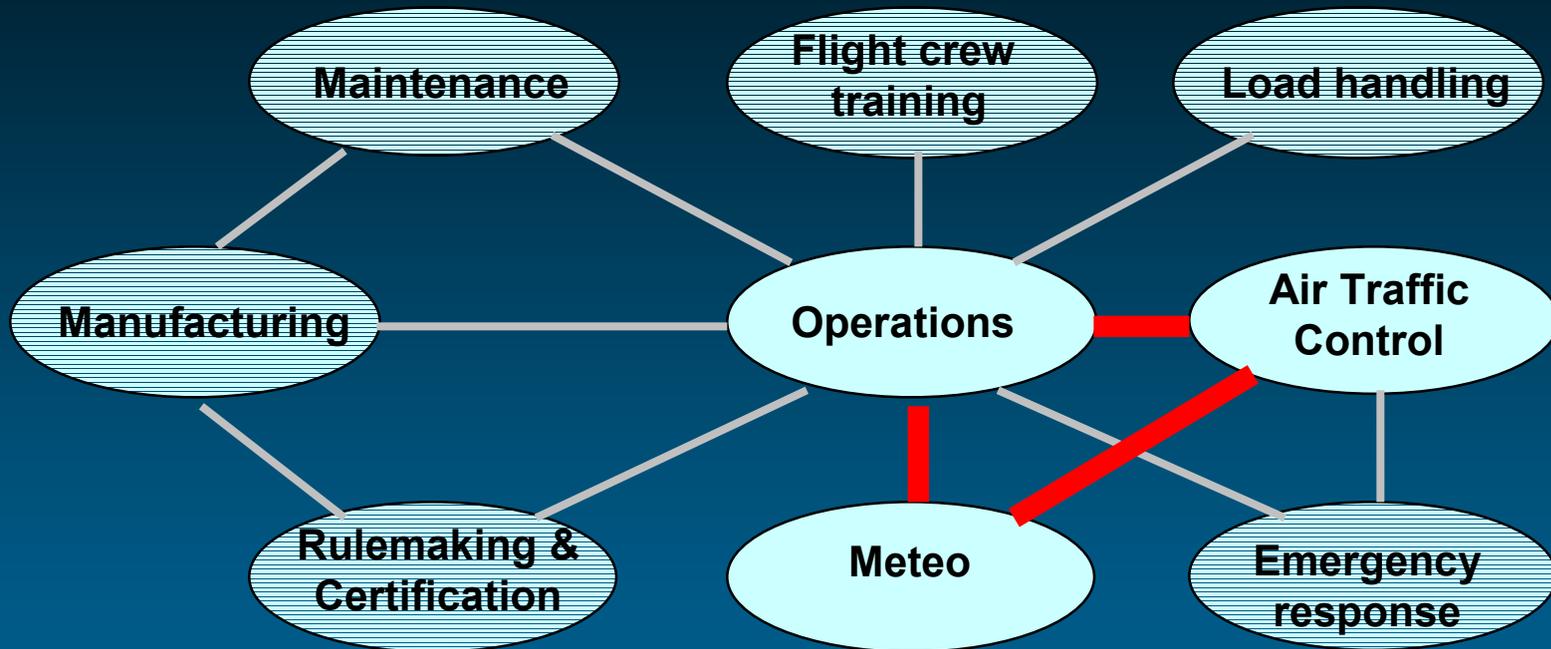


Operations - ATC



Poor communication

Operations - ATC - Meteo



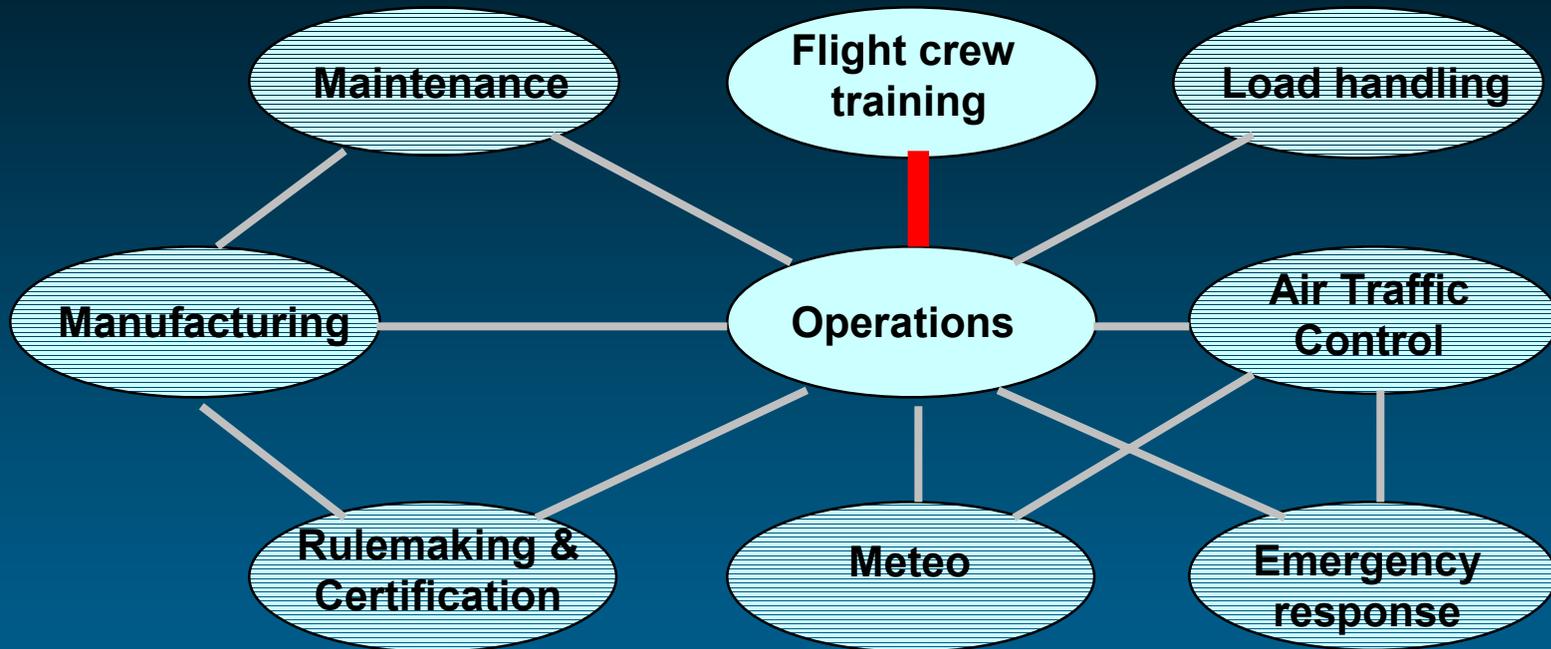
Poor collection and dissemination of weather information

Operations - ATC - Emergency response



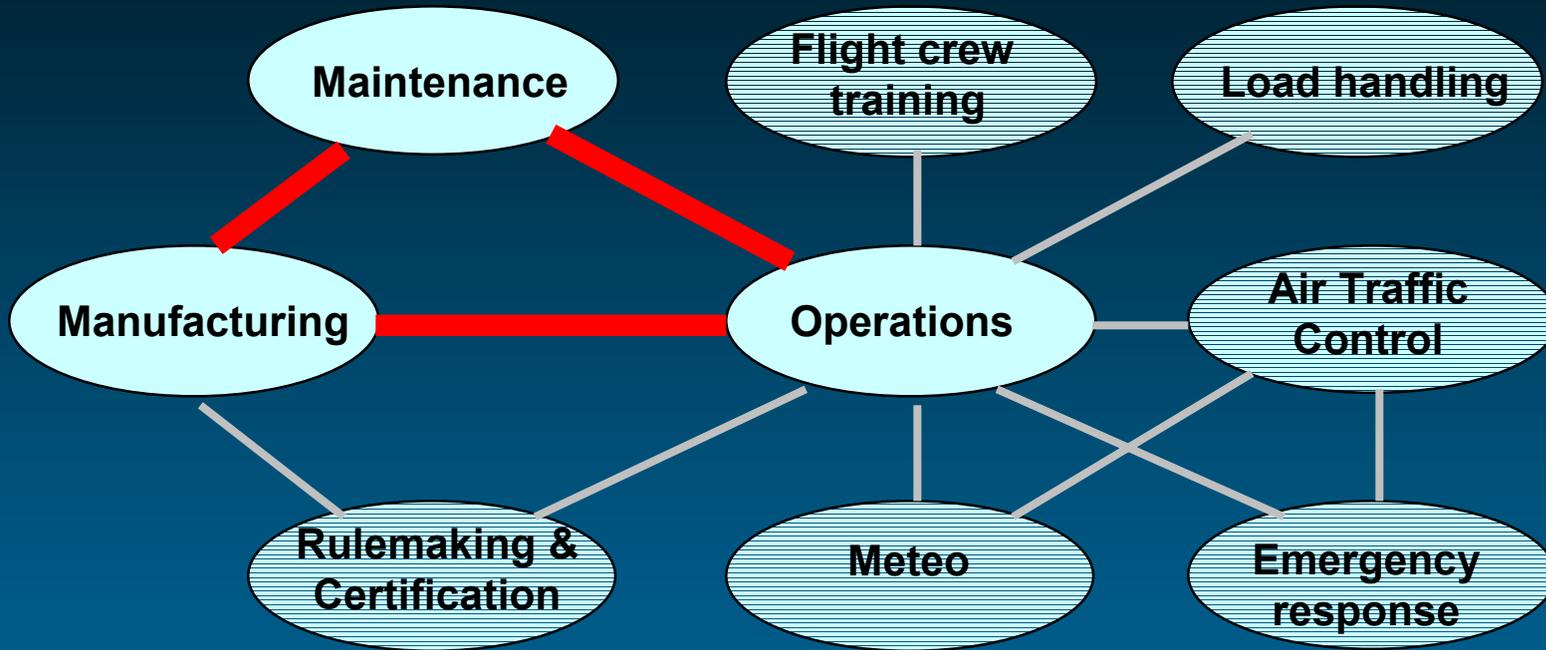
Incomplete information

Operations - Flight crew training



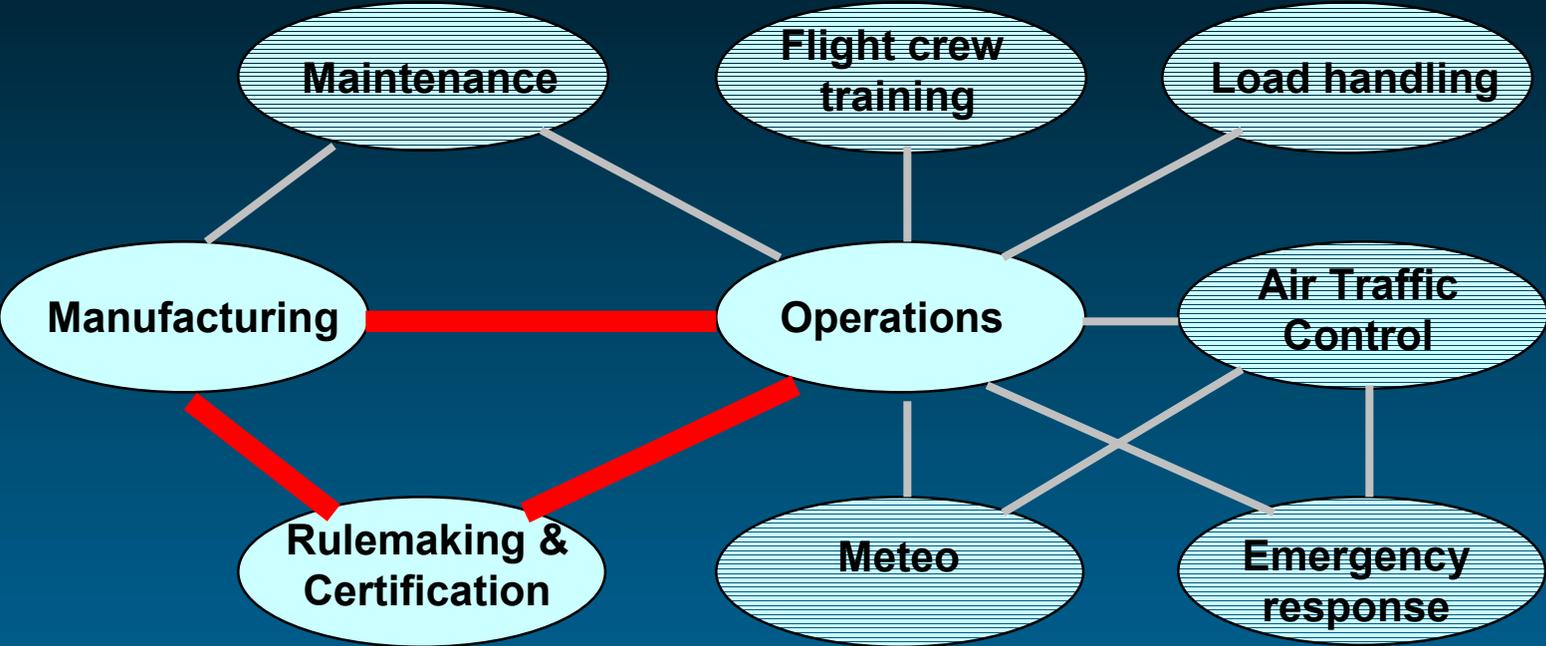
Training does not match real world

Manufacturing - Maintenance - Operations



Ambiguous maintenance and inspection information

Manufacturing - Certification - Operations



Poor dissemination of 'lessons learned'

Operations - Load handling



Poor communication of loading instructions

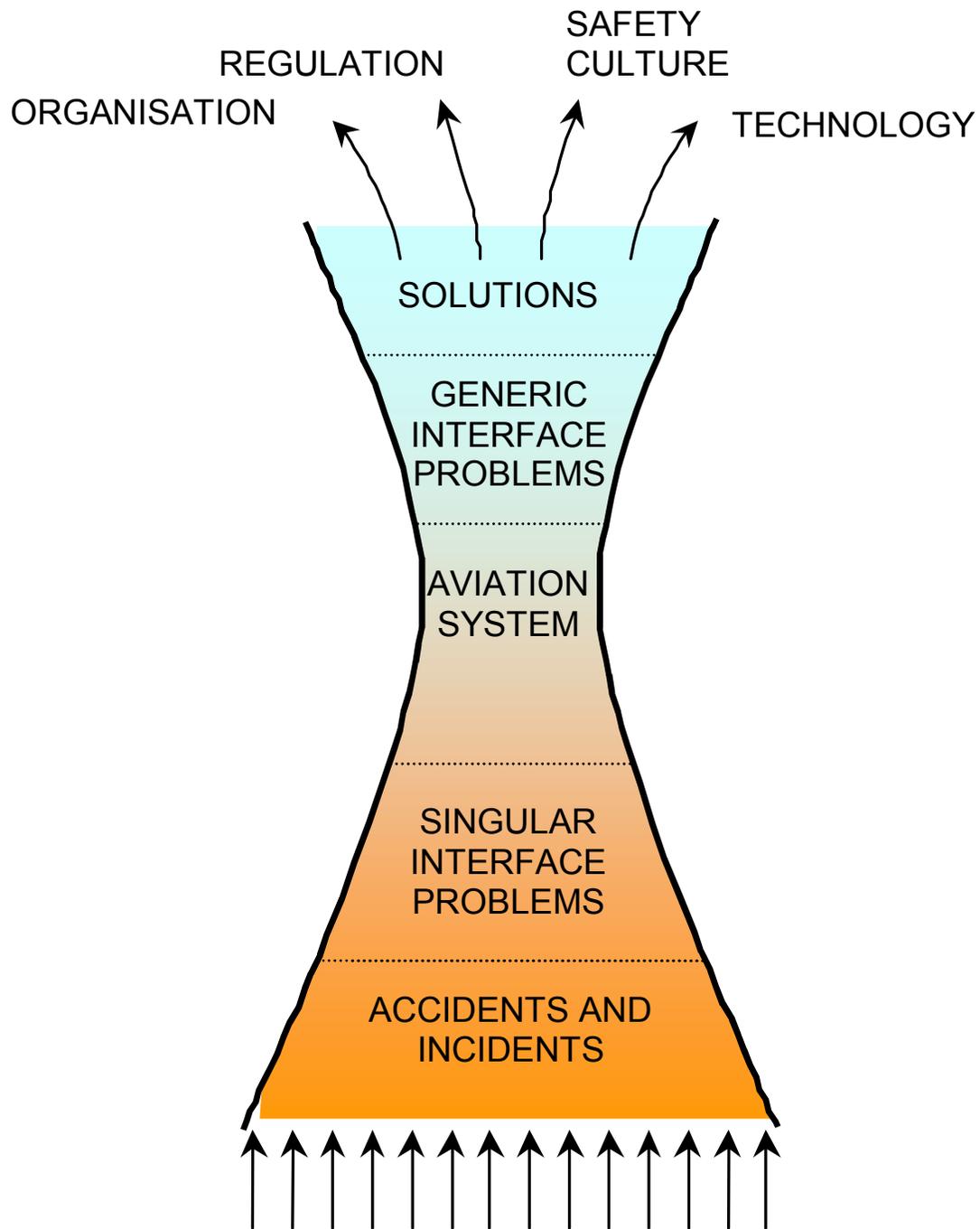
How are we going to address the issue?

- **International effort required**
 - FAA - CAA Netherlands set the example
 - ICAO and FSF involvement is desired.
- **Multidisciplinary effort required.**
- **Needs to be harmonised with CAST, FAST and CPS.**
- **Systematic analysis of solutions in the field of**
 - Organisation
 - Technology
 - Safety culture
 - Regulations

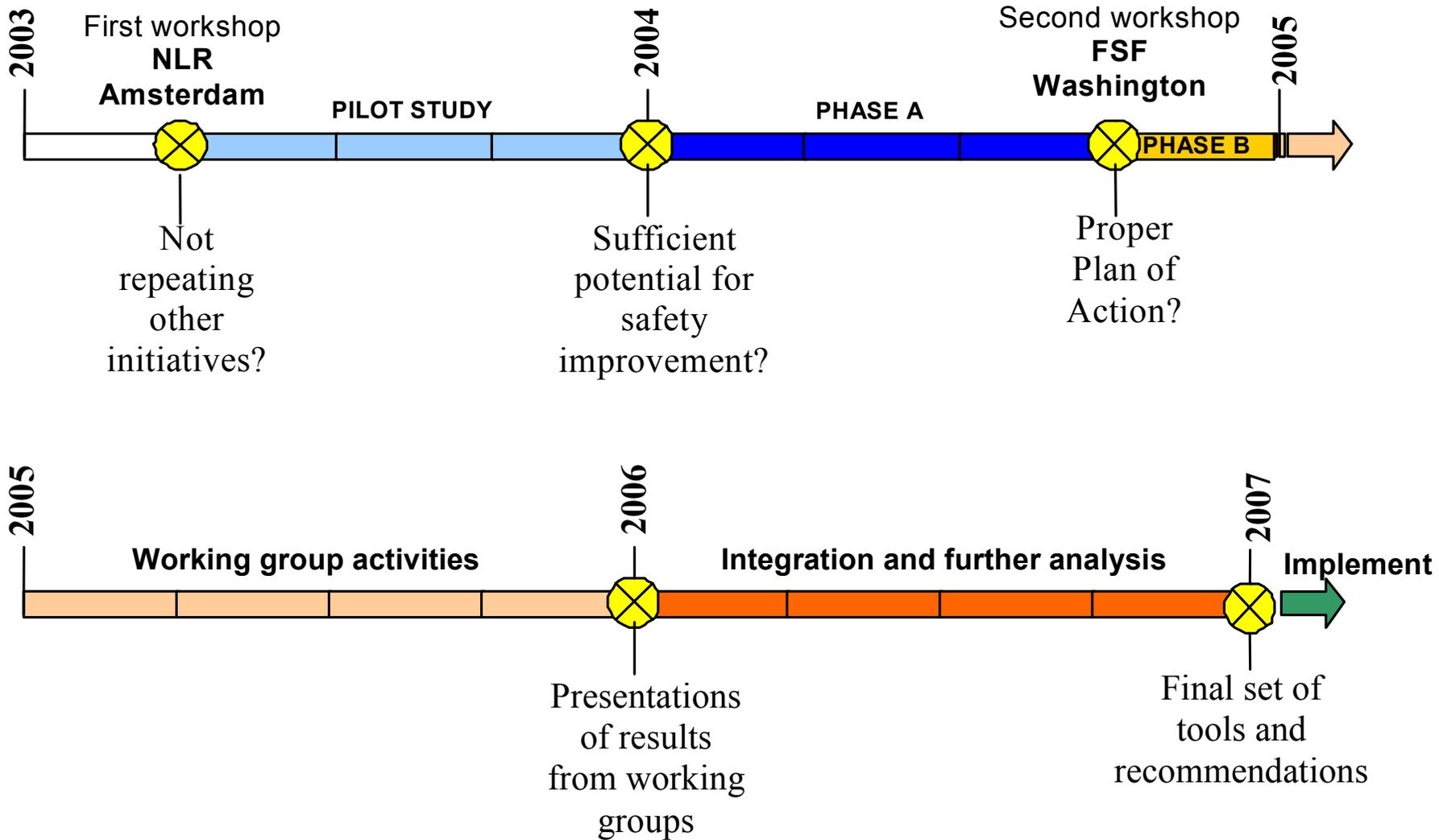
FSF involvement

- Action plan has been developed for FSF-led international initiative.
- To be discussed during workshop on 21 September 04.





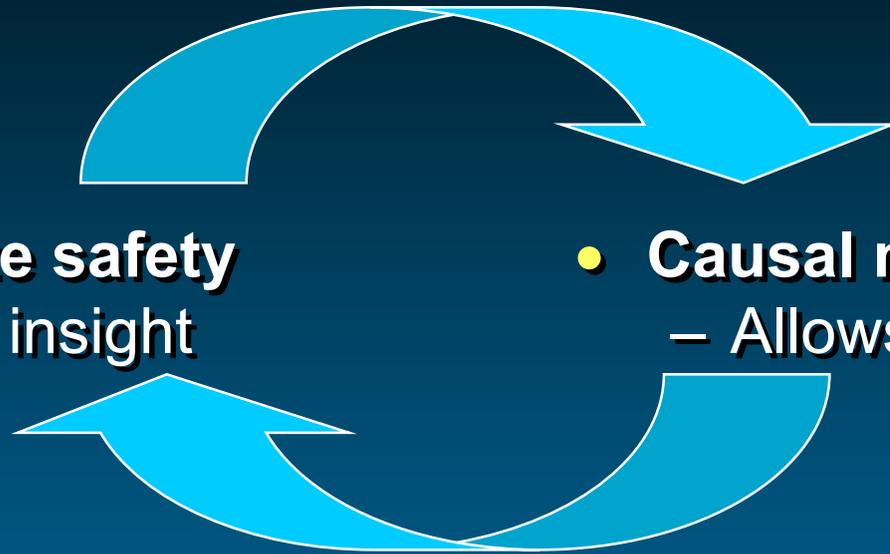
Timing



Link with causal model

- **Gate-to-gate safety**
 - Provides insight

- **Causal model**
 - Allows prioritisation



Conclusions

- **Safety can be improved if interface problems are systematically solved.**
- **Main interface problems have been identified.**
- **International multidisciplinary effort is needed.**
- **Preliminary action plan will be discussed at FSF workshop in September.**