

**The System of Aviation State Safety
Oversight to Ensure Passenger Safety**
- Challenges, Shortfalls, Responsibilities

presented by Gerhard Huettig

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About the Presenter

Fluggast/Passenger

HUETTIG GERHARD MR (ADT)

Ticketnummer/Ticket Number

05721790417302

Reiseroute/Itinerary

Von From	Nach To	Flug Flight	Klasse Class	Datum Date	Uhrzeit /Time		Reser. Resa (*)	Nicht gültig/Not valid		Meldeschlusszeit Latest check-in time limit	Gepäck Baggage (**)	Sitzplatz Seat
					Abflug Departure	Ankunft Arrival		vor Before departure	nach After departure			
BERLIN TEGEL	PARIS CDG	AF2335	L	27May	18:35	20:20	OK	27MAY	27MAY	18:05	PC	
PARIS C.GAULLE 2E	RIO JANEIRO GIG	AF0442	Q	27May	23:20	05:20	OK	27MAY	27MAY	22:20	PC	23E
AnkunftsTag+1/Arrival day+1												
RIO JANEIRO GIG	PARIS CDG	AF0447	Q	07Jun	19:00	11:15	OK	07JUN	07JUN	18:00	PC	30J
AnkunftsTag+1/Arrival day+1												
PARIS C.GAULLE 2D	BERLIN TEGEL	AF2034	L	08Jun	13:25	15:05	OK	08JUN	08JUN	12:55	PC	

About the Presenter

- Aeronautical Engineer and former Airbus Pilot
- 5 years industry (manufacturer, airline)
- 20+ plus years Professor, Consultant, Director of a simulator pilot training company
- Certified Aviation Auditor
- Technical Advisor to German victim families in the AF 447 case
- now initiating „retirement“ in working for the German Governmental Development Organization in supporting the built-up of the Afghan Civil Aviation Authority

- The safety promise to the passengers
- State Safety Oversight System – not all states are the same
- The Technology Challenge
- Facts in AF 447
- ICAO a „toothless tiger“?
- Shared responsibility
- Lessons learned

Safety is our Business!??



Missão

Aproximar pessoas com segurança e inteligência.



i Safety Oversight at American

Our safety team is responsible for administering our corporate Safety Management System throughout the organization. The team analyzes the overall safety performance of our maintenance and inflight operations and is working toward the development of a Fatigue Risk Management System to mitigate pilot fatigue.



Safety Comes First



Safi Airways is committed in maintaining uncompromising international safety standards. It was the first Afghan carrier to be certified as complying with the strict ICAO (International Civil Aviation Organization) regulations. Safi Airways is also certified with IOSA (IATA Operational Safety Audit), which is a matter of pride for the company.



Compliance to Safety, Security and Quality Standards are the cornerstones of Pakistan International Airline's operations. These are imperatives, at all times and at all levels.

All employees share the responsibility for maintaining safety, security and compliance standards established by the Airline, Industry Groups and Regulatory Agencies, and for adhering to all laws established by the countries where Pakistan International Airlines conducts its operations.

- ICAO vs. IATA (IOSA)
- ICAO SARPS transformed into national legislation (art. 37 Chicago Convention)
- State's Safety Oversight Obligations:
 - Monitoring of safety performance.
 - Verifying compliance with applicable safety regulatory requirements.
 - Safety regulatory auditing.
 - Oversight of new or changed systems, operations, products or procedures.
 - Publication of regulatory instructions or advisory material based on findings of oversight activities.
 - Generation and maintenance of safety oversight records

8 Critical Elements



Continuous Monitoring Approach (CMA) / Universal Safety Oversight Audit Program (USOAP)

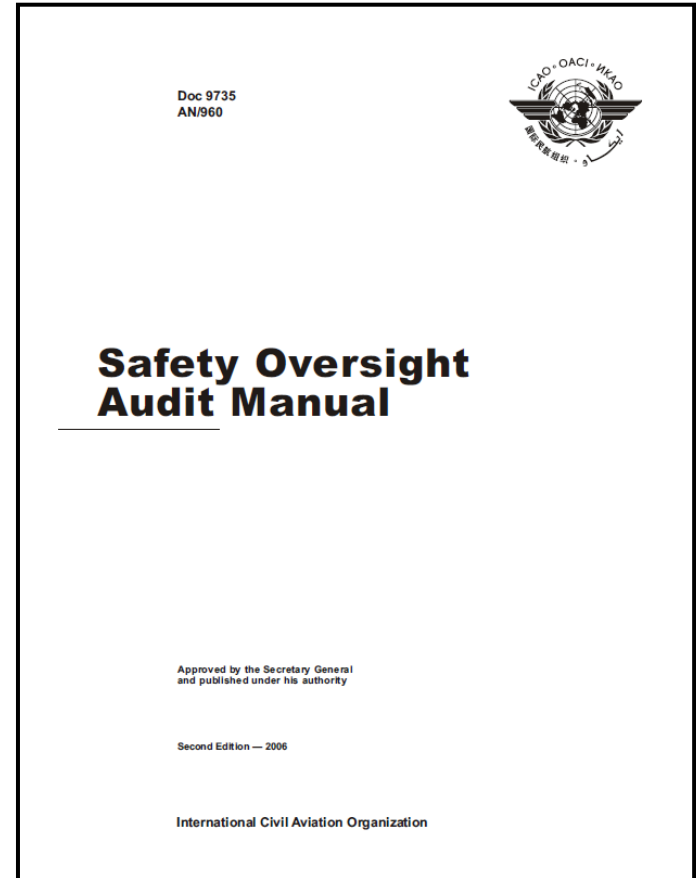


USOAP based on

- defined audit procedure (DOC 9735)
- State Aviation Activity Questionnaire
- Protocol Questions
- Compliance Checklists

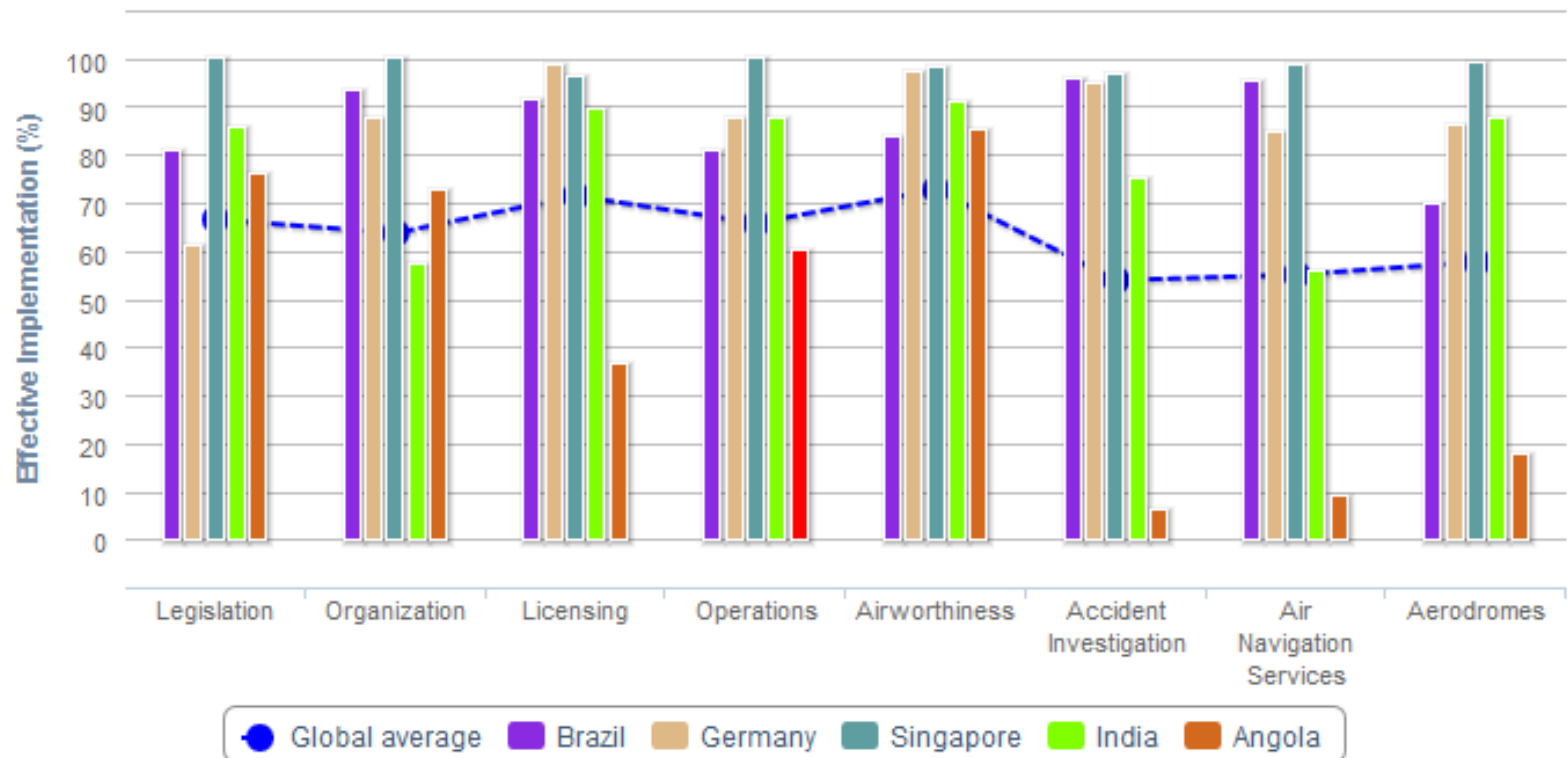
resulting in

- Corrective Action Program
- to be reviewed by ICAO for implementation



Differences between States

Effective Implementation

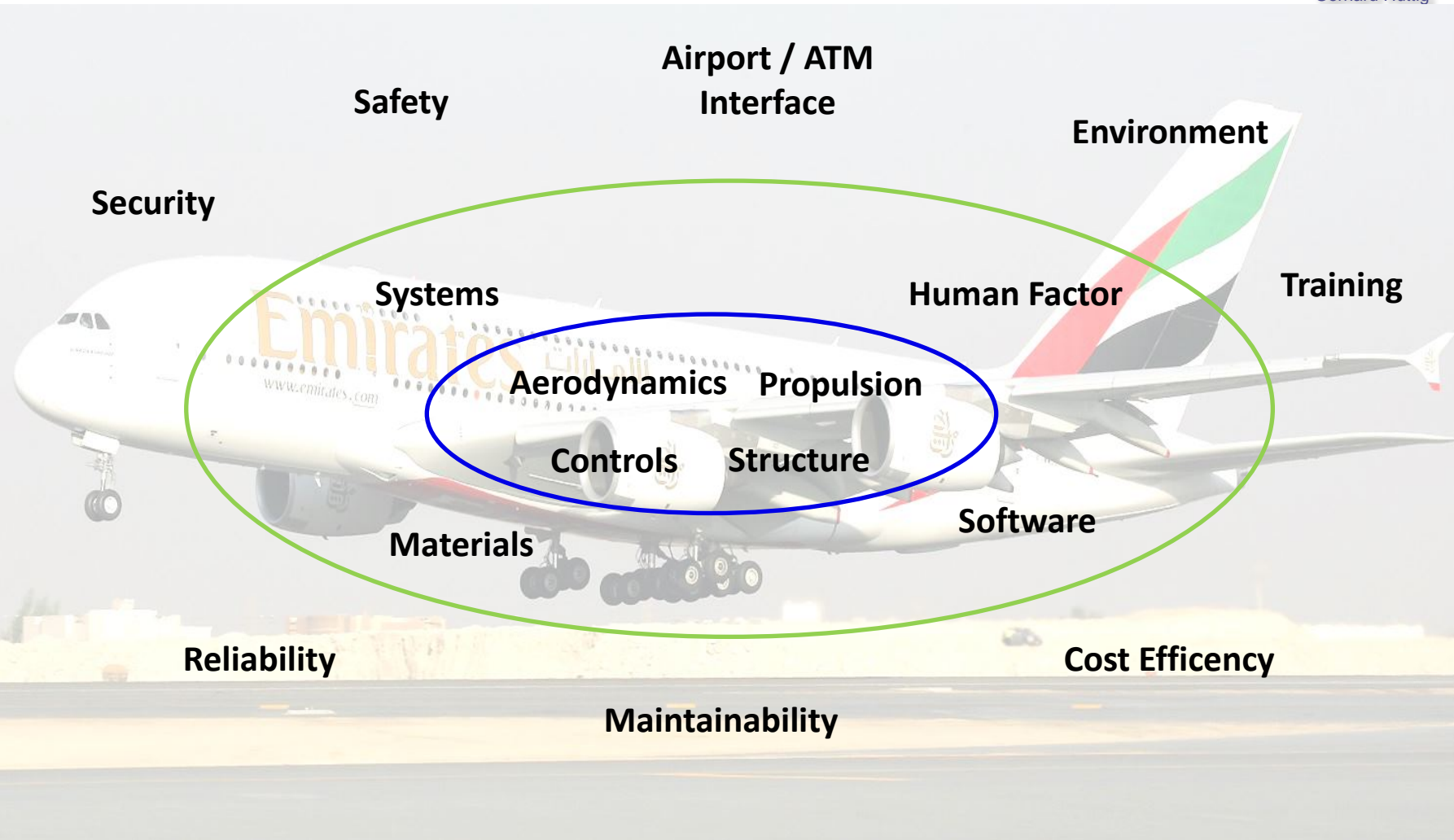


State Safety Oversight System

and how this looks like in reality.....



The Technology Challenge



The Technology Challenge

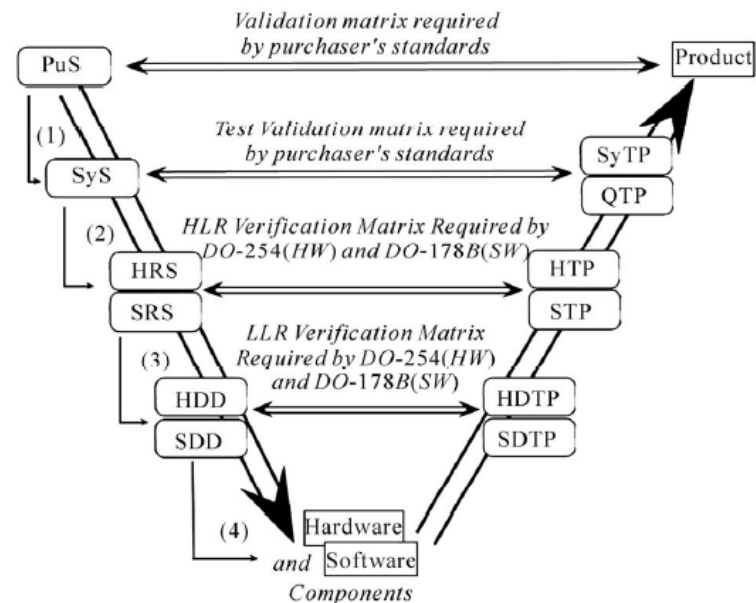
EASA, FAA, UK CAA require aircraft systems built under control of processes

(EUROCAE ED-80, EUROCAE ED-12)

Requirements Engineering Framework (REF)

- Management of requirements
- Management of changes impacting requirements

(V-Modell)



Computer Mixability [Airbus]

Aircraft computers are subject to hardware and software evolutions, which generate different part numbers.

Some of these are interchangeable, but are not necessarily mixable.

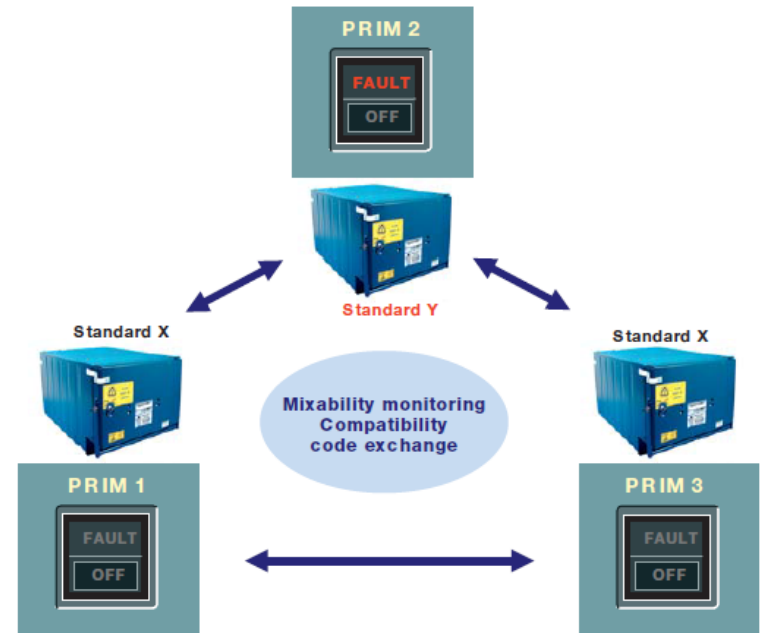
Mixability, or compatibility, is about the ability of computers bearing different part numbers to interact correctly in a system.



Non-compliance with this principle may lead to significant events!

FCPC mixability monitoring

This monitoring is based on a “compatibility” code exchanged and compared between the FCPC.

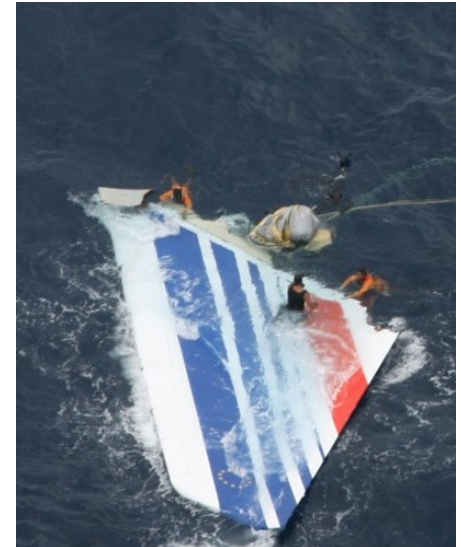


Facts in AF 447

BEA Conclusions

Thus, the accident resulted from the following succession of events:

- ❑ Temporary inconsistency between the airspeed measurements, likely following the obstruction of the Pitot probes by ice crystals that,
- ❑ Inappropriate control inputs
- ❑ The lack of any link by the crew between the loss of indicated speeds called out and the appropriate procedure;
- ❑ The late identification by the PNF of the deviation from the flight path and the insufficient correction applied by the PF;
- ❑ The crew not identifying the approach to stall, their lack of immediate response and the exit from the flight envelope;
- ❑ The crew's failure to diagnose the stall situation and consequently a lack of inputs that would have made it possible to recover from it.



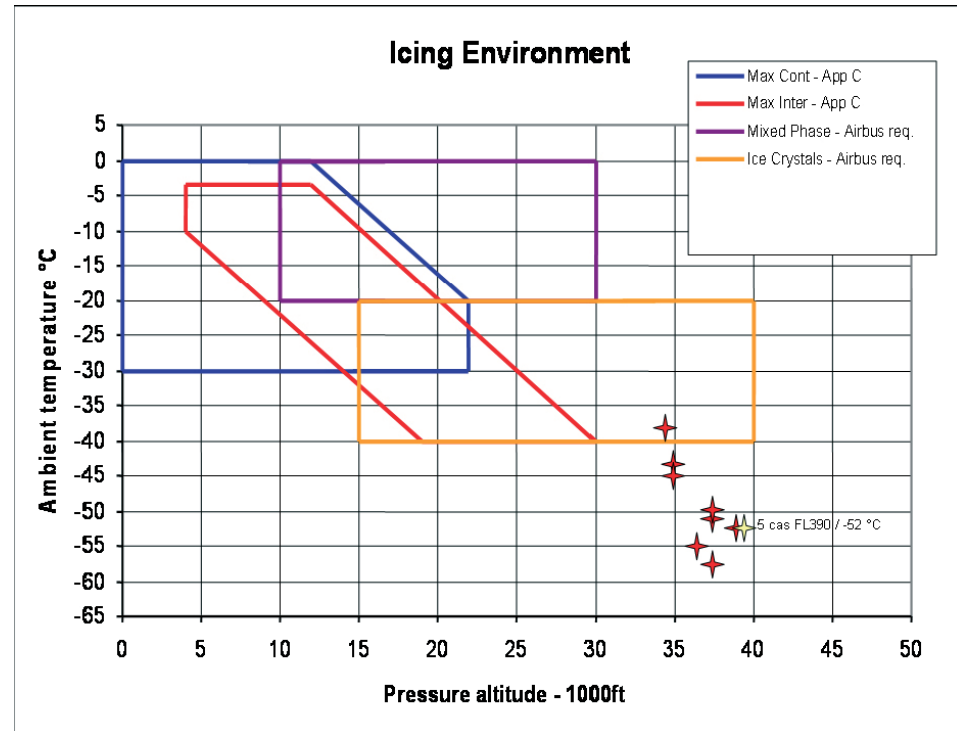
however, Criminal Investigation AF 447 in France still proceeding !

Nov 30, 2009: BEA recommends that EASA

1. undertake studies to determine with appropriate precision the composition of cloud masses at high altitude,

and

2. in coordination with the other regulatory authorities, based on the results obtained, modify the certification criteria.



Facts in AF 447

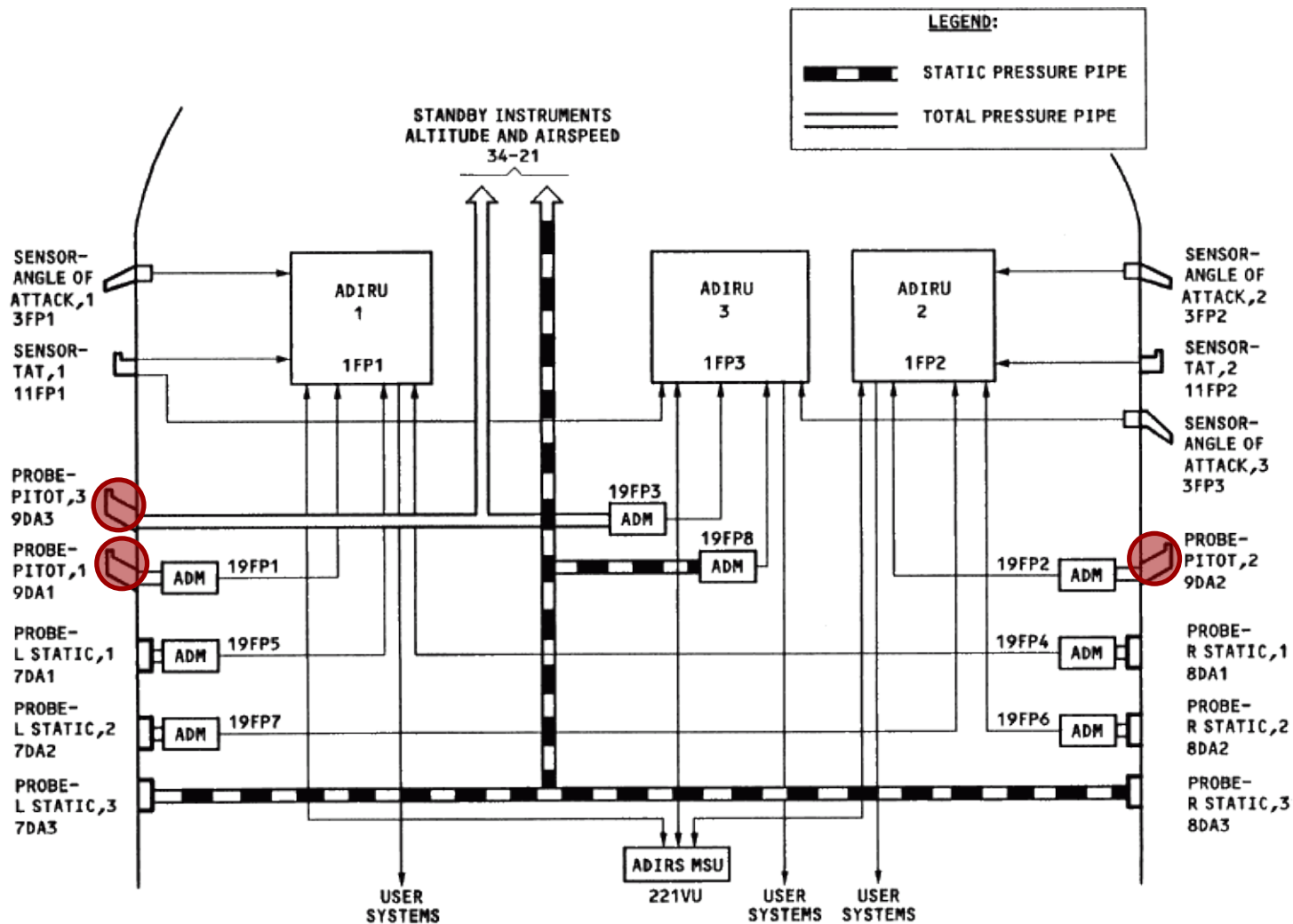
Nov 19, 2009 the BEA recommends that EASA and ICAO:

- ~~ex~~ extend as rapidly as possible **to 90 days** the regulatory transmission time for ULB's installed on flight recorders on aeroplanes performing public transport flights over maritime areas;
- ~~m~~ake it mandatory, as rapidly as possible, for aeroplanes performing public transport flights over maritime areas to be equipped with an **additional ULB capable of transmitting on a frequency (for example between 8.5 kHz and 9.5 kHz)** and for a duration adapted to the pre-localisation of wreckage;

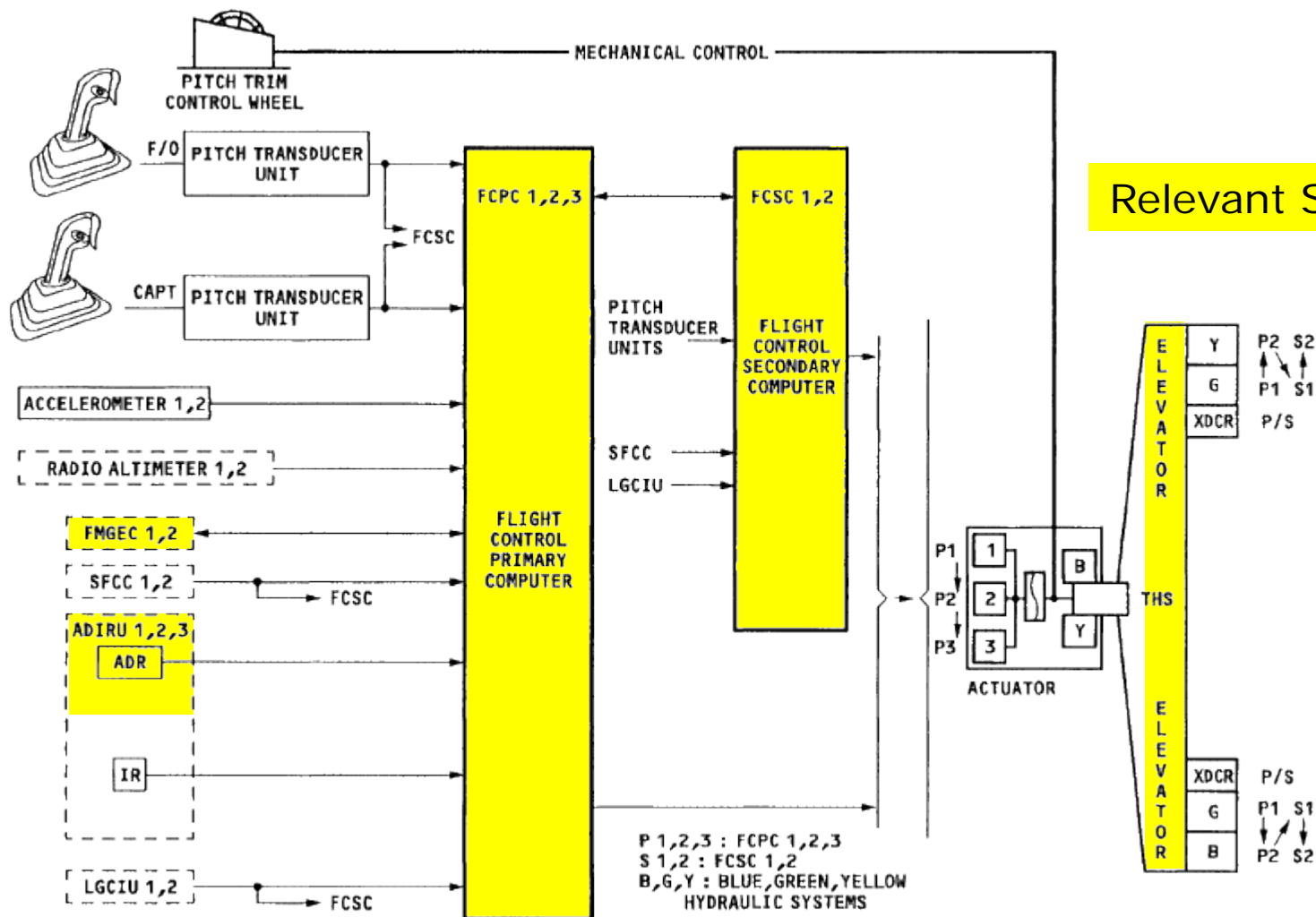


Figure 16: FDR

Facts in AF 447 – Air Data System



Facts in AF 447 – Electronic Flight Control System



Relevant Systems


A330 EFCS Pitch Control

Facts in AF 447

It was never explicitly studied how the **simultaneous interruption of air data #1 / #2 / #3 with given time delays (0 – 2 sec)** is influencing the behaviour of the EFCS and FMGEC (Autopilot) !!!!

EASA AD No : 2011-0199

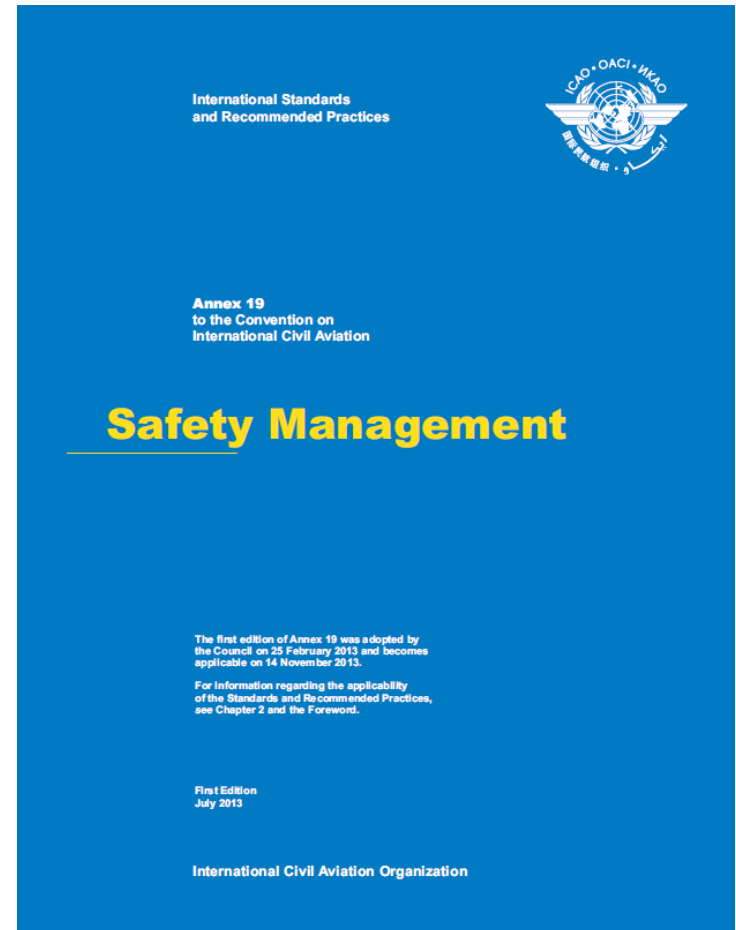
however:

EASA	AIRWORTHINESS DIRECTIVE
	<p>AD No.: 2011-0199</p> <p>Date: 27 October 2011</p> <p>Note: This Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) No 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.</p>
<p>This AD is issued in accordance with EC 1702/2003, Part 21A.3B. In accordance with EC 2042/2003 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [EC 2042/2003 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].</p>	
<p>Type Approval Holder's Name :</p> <p>AIRBUS</p>	<p>Type/Model designation(s) :</p> <p>A330 and A340-200/-300 aeroplanes</p>
<p>Reason:</p>	<p>It has been determined that, when there are significant differences between all airspeed sources, the flight controls of an Airbus A330 or A340 aeroplane will revert to alternate law, the autopilot (AP) and the auto-thrust (A/THR) automatically disconnect, and the Flight Directors (FD) bars are automatically removed.</p>
	<p>Since that AD was issued, new FCPC software standards have been developed that will inhibit autopilot engagement under unreliable airspeed conditions.</p>

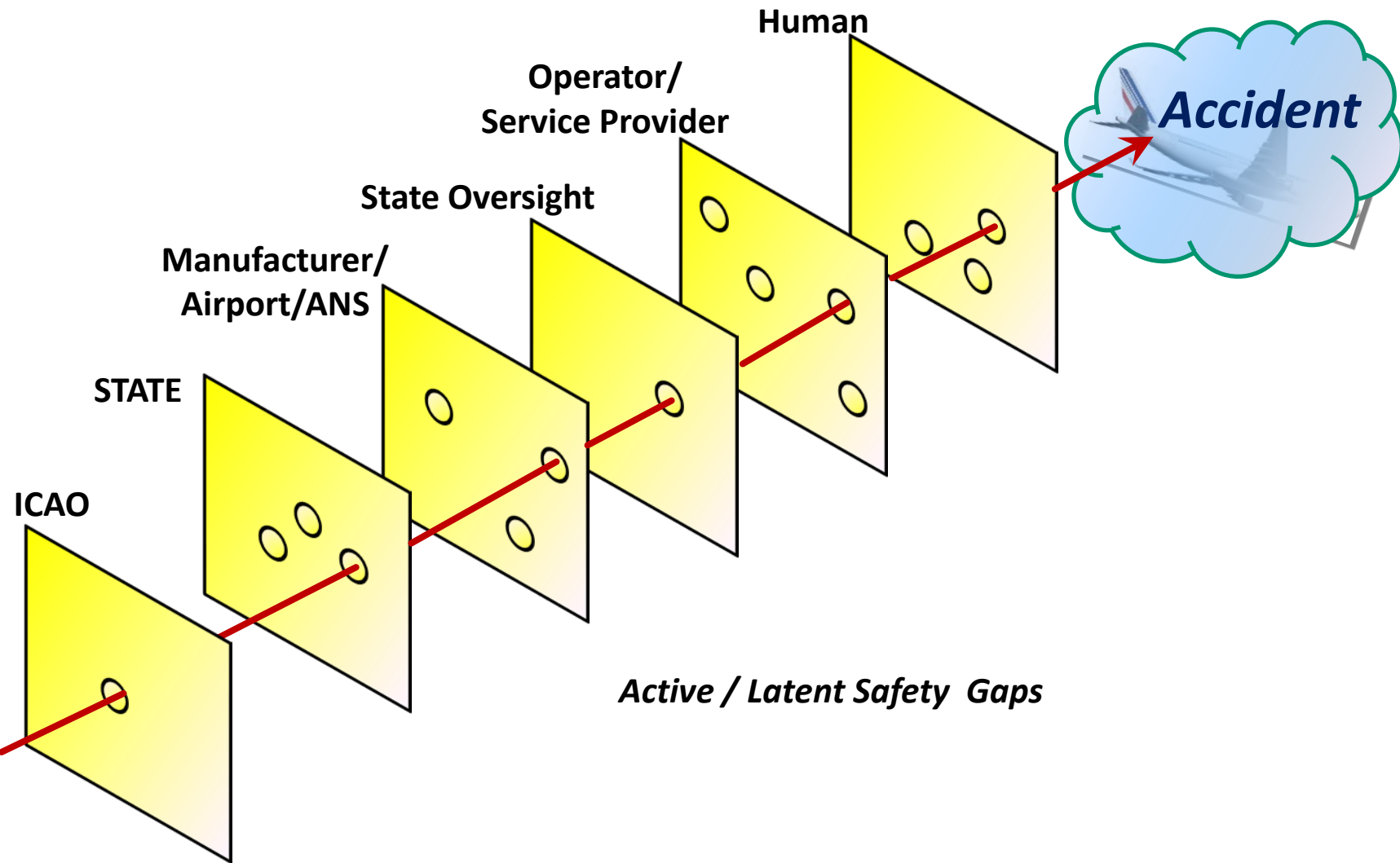


ICAO a „toothless tiger“?

- ICAO cannot impose any punitive actions on states
- ICAO may raise „**Significant Safety Concerns**“ for single states and publish them
- ICAO recently introduced the instrument „**Mandatory Information Request**“
- ICAO continues to improve the safety systems in aviation (Annex 19)



Shared Responsibility



- not every stakeholder takes SAFETY equally serious
- beside all efforts, 100 % SAFETY is impossible
- a strong and economically independent community - as „Science“ is - can push the established stakeholders to perform better
- when you fly next time in remote areas of the world, look twice with whom you fly (remember: when the aircraft doors are closed, you have passed the „point of no return“)

Thank you for your attention!