

Learning from Incidents

Occurrence Reporting in Denmark

The first 5 years

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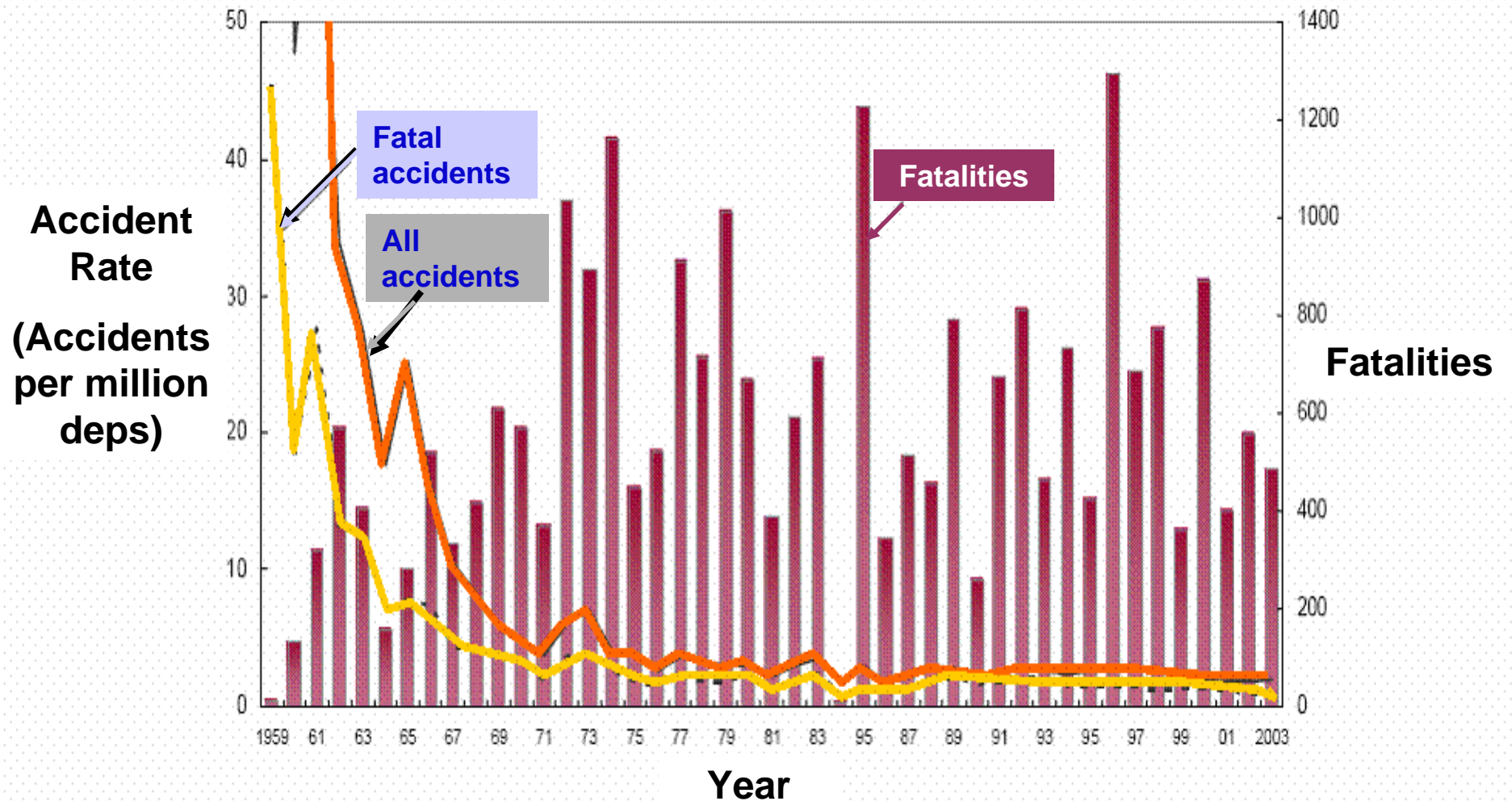
Mexico City 10 – 11 April 2007



I plan to cover:

- Why do we need a reporting system ?
- How was it implemented in Denmark?
- Acceptance by users ?
- Lessons learned– strenghts and weaknesses in occurence reporting

We are doing quite well –
so why do we want more reports ?

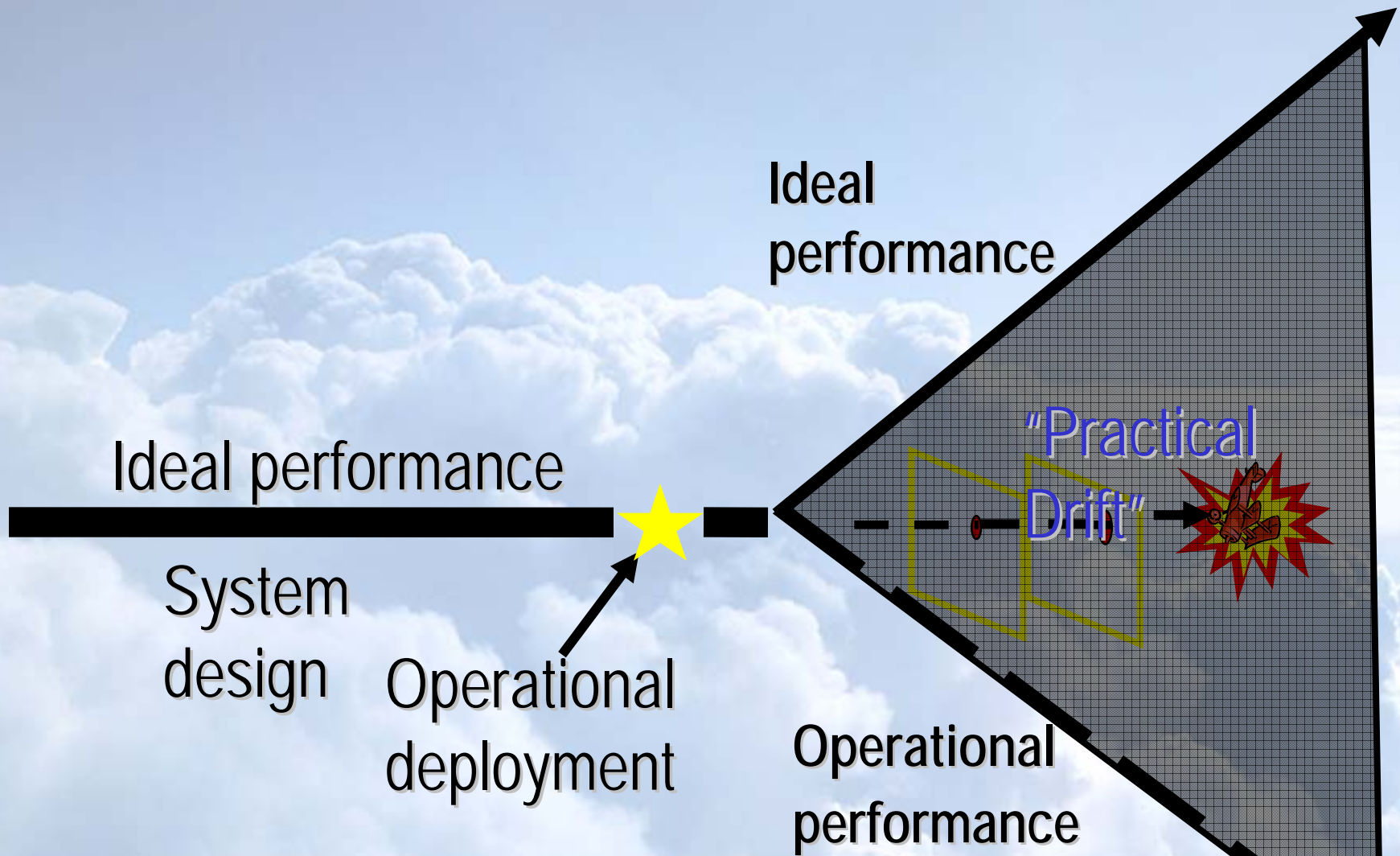


”Normal” accidents

- Why do we want reports on the minor incidents ?
 - Without Data, One Can Only Have An Opinion
 - Learn from others mistakes – because you won’t live long enough to make them all yourself
 - Accidents does not only happen because of deviation from rules or mistakes
 - Deviations can become the normal situation
 - Challenger accident
 - Alaska Airlines



Capturing the Drift

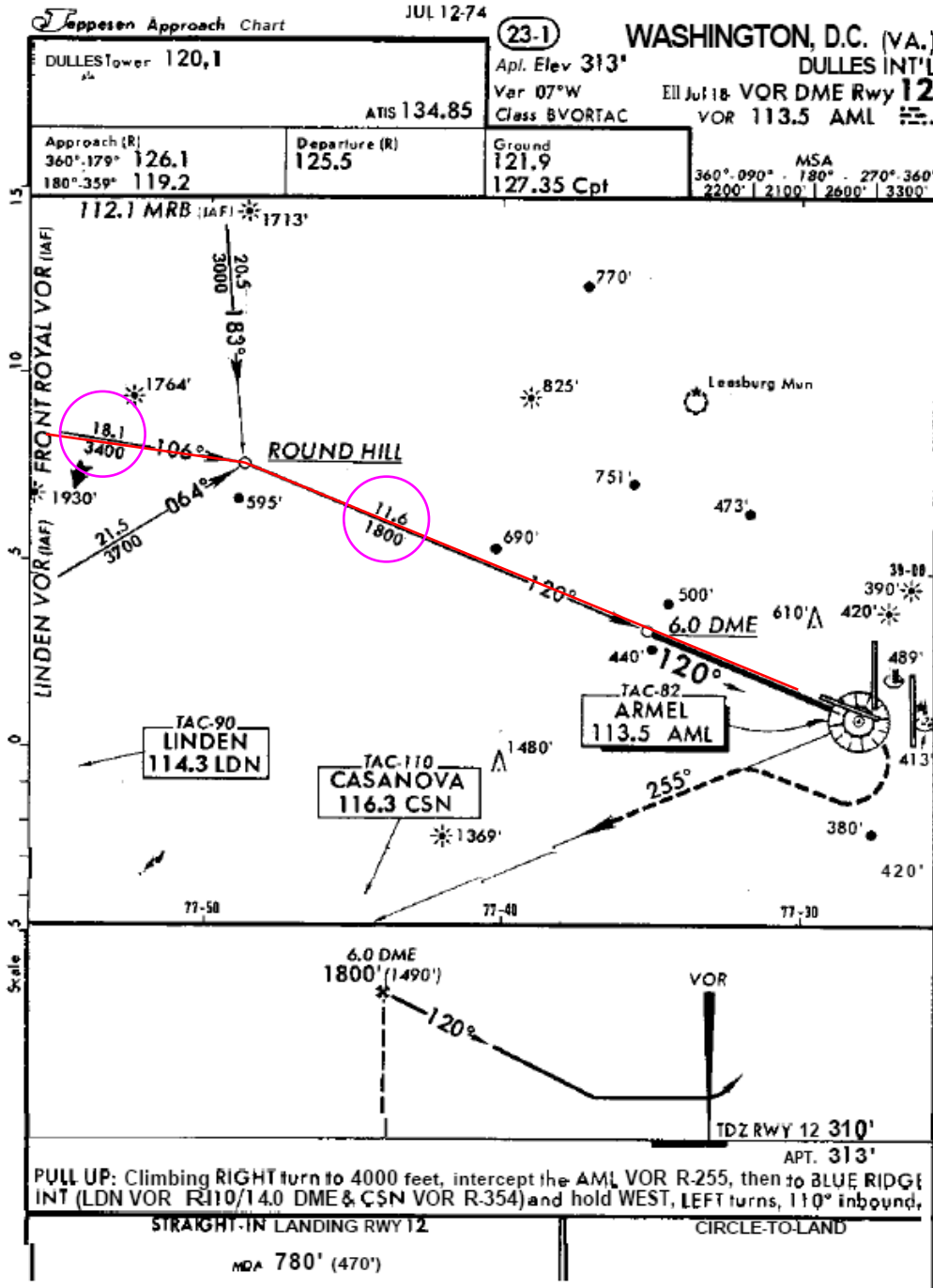


Capturing the Drift

- Reactive systems – Failures
 - ✓ Accident investigation
 - ✓ Major incident investigation

- Proactive systems – Routine operational events
 - ✓ Voluntary self-reporting systems (Aviation Safety Action Programme a.o.)
 - ✓ Electronic safety data acquisition systems (Flight Operation Quality Assurance)
 - ✓ Direct observation safety data acquisition systems (Line Oriented Safety Audit)
 - ✓ Mandatory reporting systemsn **(2003/42/EC and BL 8-10)**

APPENDIX D



"Dress rehearsal for disaster"

December 1974:

- FO: "I hate this altitude jumping around – gives you headache after a while"
- 11:09:20 Capt: "Get some power on"
- 11:09:22 Sound of crash
- TWA hits the terrain before Round Hill on approach to Washington
- 92 fatalities
- Led to creation of first reporting system in USA

Mexico City 10 – 11 April 2007



TRANS WORLD AIRLINES, INC.
BOEING 727-231, N54328
BERRYVILLE, VIRGINIA
DECEMBER 1, 1974

SYNOPSIS

At 1110 e. s. t., December 1, 1974, Trans World Airlines, Inc., Flight 514, a Boeing 727-231, N54328, crashed 25 nautical miles northwest of Dulles International Airport, Washington, D. C. The accident occurred while the flight was descending for a VOR/DME approach to runway 12 at Dulles during instrument meteorological conditions. The 92 occupants -- 85 passengers and 7 crewmembers -- were killed and the aircraft was destroyed.

The National Transportation Safety Board determines that the probable cause of the accident was the crew's decision to descend to 1,800 feet before the aircraft had reached the approach segment where that minimum altitude applied. The crew's decision to descend was a result of inadequacies and lack of clarity in the air traffic control procedures which led to a misunderstanding on the part of the pilots and of the controllers regarding each other's responsibilities during operations in terminal areas under instrument meteorological conditions. Nevertheless, the examination of the plan view of the approach chart should have disclosed to the captain that a minimum altitude of 1,800 feet was not a safe altitude.

“The alarming thing is that we do not take advantage of our good fortune. Here we have a brush with disaster; a live crew and an intact aircraft to tell the story.

And yet we never opened the book.”

*Bobbie R. Allen
Director*

Bureau of Safety of the Civil Aeronautics Board (later the NTSB) - 1966

”Opening the book”

The birth of the danish system

- 1997: CAA-DK forced to reveal contents of occurrence reports (i.a.w. freedom of information act)
 - Reproach from the operators
 - AIB stopped providing supplemental information to CAA
- 1998: number of reports fell to half compared to 1996
- 1998: Dialogue with MoT on new reporting system started
- 2001: Air Navigation Act changed with unanimous agreement from Parliament

The Air Navigation Act

§ 89 b. The Minister of Transport may give regulations stating that, for the use in the Civil Aviation Administration - Denmark's preventive flight safety work, persons covered by § 35 or § 74, companies and employees in companies as well as aircraft owners shall report to the Civil Aviation Administration - Denmark any operational interruption and other irregular circumstances of importance to flight safety that has not resulted in an aircraft accident or aircraft incident, cf. § 135. The Minister determines in which situations reporting shall be made, when and in what form the notification shall be given and what it shall contain.

(2) The Civil Aviation Administration - Denmark's personnel and any experts called in shall, under §§ 152 and 152 a-e of the Danish Criminal Code, be under the obligation to keep secret any information reported in accordance with regulations laid down in pursuance of subsection (1), cf. however, subsection 3.

§ 149 a. A person who in accordance with rules laid down in pursuance of § 89 b has reported circumstances that have not resulted in an aircraft accident or aircraft incident, cannot be punished for the circumstance in question for violation of § 42, regulations laid down in pursuance of §§ 31, 52, 54, 82 or 83, or regulations in EU regulations in areas covered by the Act.

§ 152. The Minister of Transport and Energy may decide that the Civil Aviation Administration - Denmark - in addition to the same authority given by the provisions of this Act - shall exercise certain powers conferred to the Minister under this Act.

Civil Aviation Administration - Denmark
Regulations for Civil Aviation

BL 8-10

Regulations on mandatory reporting of flight safety occurrences*
Edition 2, 13 June 2005

In pursuance of § 89 b and § 149 (10), of the Air Navigation Act, cf. Consolidation Act no. 543 of 13 June 2001, the Civil Aviation Administration - Denmark hereby stipulates as follows on the authority of the Ministry of Transport and Energy, cf. Order no. 795 of 3 September 2001 of on delegation of authorities to the Civil Aviation Administration - Denmark and on publication of the Regulations issued by the Administration:

Reference documents

1. BL 2-1, Authorisation of organisations to manufacture and maintain aircraft or aircraft equipment, latest edition.
- 1.1 BL 2-1, Authorisation of organisations to manufacture and maintain aircraft or aircraft equipment, latest edition.
- 1.2 BL 2-4, Regulations on JAR-145 authorisation, latest edition.
- 1.3 BL 3-18, Regulations on establishment of aerodrome management at approved aerodromes etc., latest edition.
- 1.4 BL 5-40, Order on the duty to report aircraft accidents and incidents, latest edition.

- 1.5 BL 5-50, Regulations on approval of air operators to carry out commercial air traffic in accordance with JAR-OPS 1 and/or JAR-OPS 3, latest edition.
- 1.6 BL 6-09, Regulations on implementation of JAR-FCL (pilot licences, aeroplane and helicopter), latest edition.
- 1.7 BL 7-8, Regulations on operations of air traffic service units, latest edition.
- 1.8 The documents mentioned in paragraphs 1.1-1.7 can be found on Retsinformation's (Legal Information's) homepage www.retsinfo.dk and on the Civil Aviation Administration - Denmark's homepage www.slv.dk. The documents may further be bought on application to

Civil Aviation Administration - Denmark
Service Service
P.O. Box 744
Ellebjergrvej 50
DK-2450 Copenhagen SV
Phone: +45 3618 6000
Fax: +45 3618 6001
E-mail: ais@slv.dk

* The BL contains provisions implementing parts of Directive 2003/42/EC of the European Parliament and of the Council of 13 June 2003 on mandatory reporting in civil aviation (Official Journal of the European Union L 167 of 4 July 2003).

Flight safety occurrence (occurrence):
Any operational interruption, defect, fault or other irregular circumstance that has or may have influenced flight safety and that has not resulted in an accident or serious incident, cf. § 135 of the Air Navigation Act and BL 5-40.

http://www.slv.dk/Dokumenter/dscgi/ds.py/Get/File-7740/BL8-10_ed2_uk.pdf

Statens Luftfartsvæsen
Civil Aviation Administration, Denmark

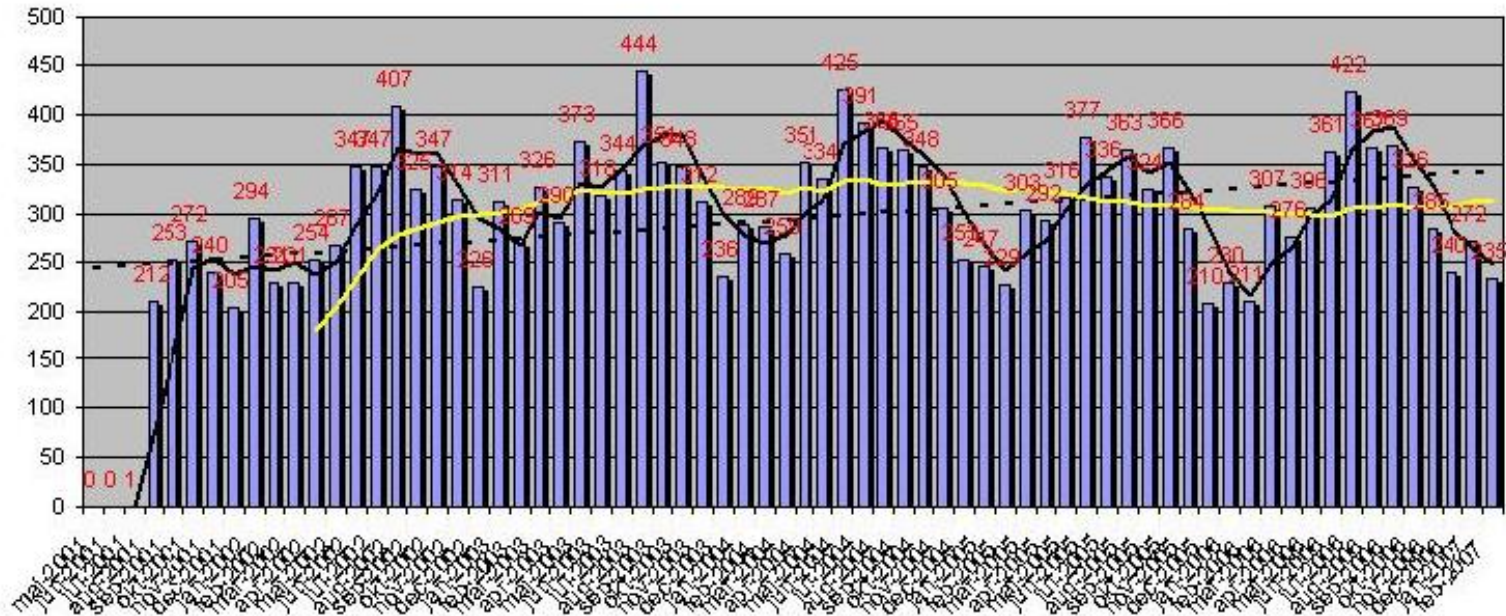
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How about media / the public ?

- No freedom of information
- CAA publishes annual anonymized report.
 - until 2003 mainly statistical information
 - from 2004 expanded with analysis, CAA reactions and campaigns
- Annual reports supplemented with ad-hoc electronic newsletters and presentations for interested parties (hospitals, shipping)

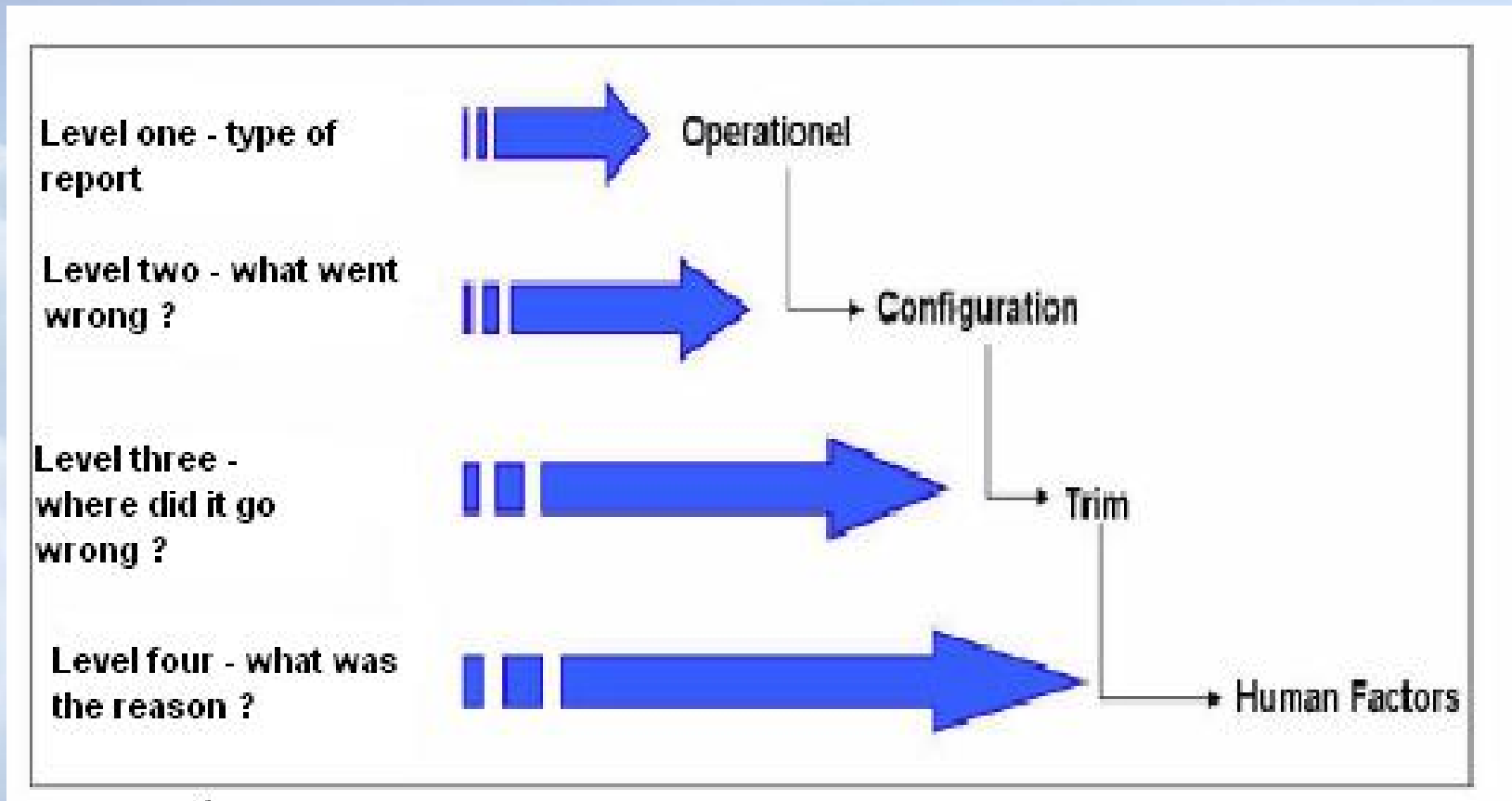
Occurrences month by month



■ BL 8-10 Rappporter - Alle Begivenheder
 — Rullende gennemsnit, 3 mdr.
 - - - Lineær (BL 8-10 Rappporter - Alle Begivenheder)
 — Rullende gennemsnit, 12 mdr.

Total number of occurrences per 27th march 2007: 20.722
Maximum number any month: 444 (September 2003)
Minimum number any month: 205 (December 2001)
Average number per month: 308
Average number per year: 3.700

Coding of occurrences



Tahoma 8 F K U

ALARMER

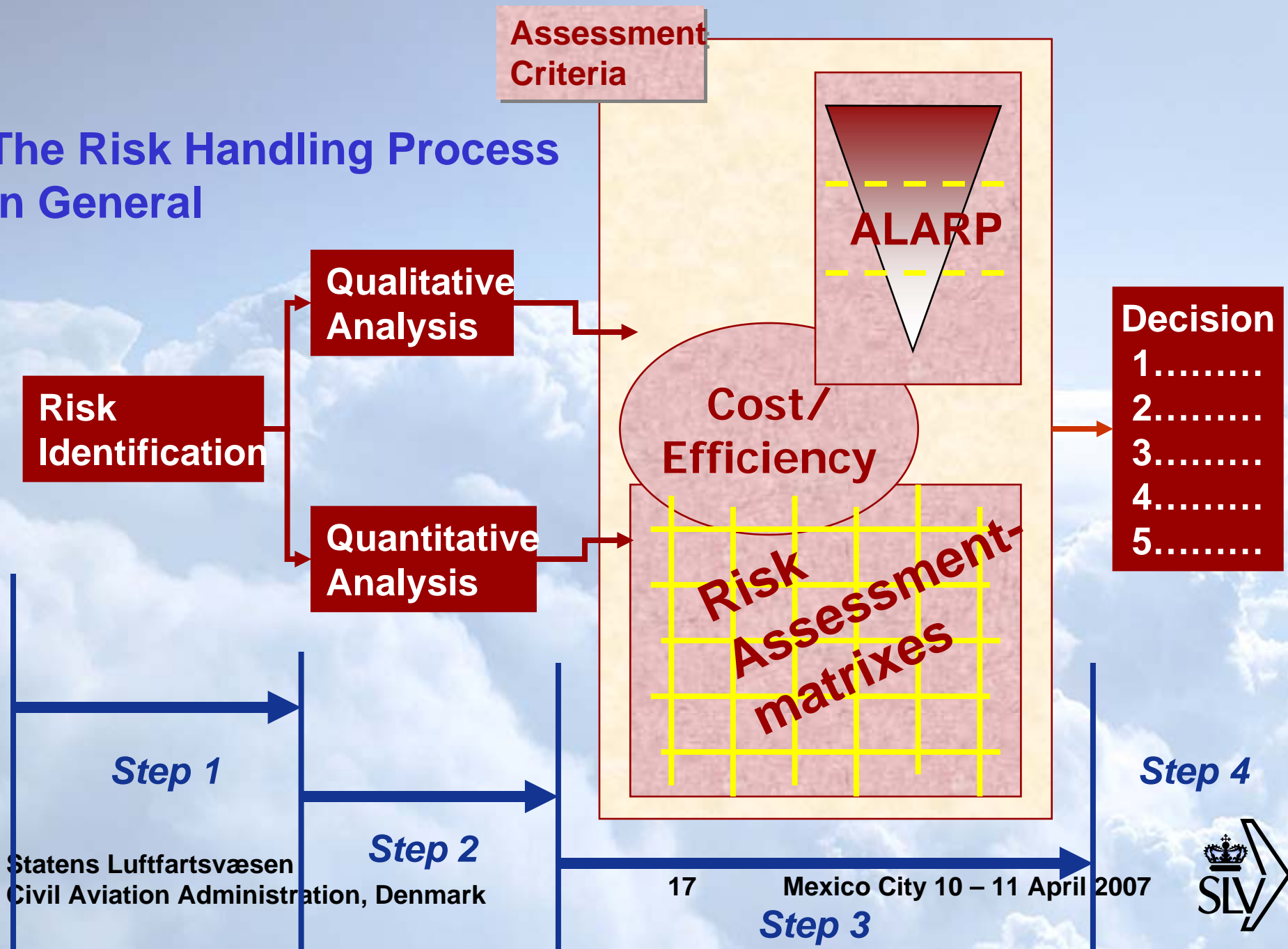
Forklaring
Opdater






1		Runway Incursions
2		Uautoriseret indtrængen i luftrum
3		Loading error
4		Altitude deviation
5		Air condition & Pressure
6		Provision of ATM service
7		Fejl i overvågningsfunktion
8		Fejl i kommunikationsfunktion
9		Fejl i dataformidling
10		Ingen radioforbindelse

11		Pilot handling
12		Configuration (Human factor)
13		TCAS
14		Ground handling
15		De-Icing
16		Maintenance
17		Engine problems
18		Landing gear
19		Nav equipment
20		Passenger behaviour

The Risk Handling Process In General



S e v e r i t y	Safety Criticality classification						
	Accident, i.e. loss of or substantial damage to the aircraft and/or serious injury or death of occupants. Near accident, i.e. or serious incident where an accident nearly occurs. No safety barriers remaining. The outcome is not under control and could vary.	Catastrophic or serious occurrence					
	A large reduction in safety margins. The outcome is controllable by use of existing emergency or non-normal procedures and/or emergency equipment. The safety barriers are only one or very few going to none, Minor Injury to occupants and/or minor damage.	Hazardous occurrence					
	A significant reduction in safety margins but several safety barriers remain to prevent an accident. Reduced ability of the flight crew to cope with the increase in workload or as a result of the conditions impairing their efficiency. Minor injury to occupants.	Major occurrence					
	Operating limitations and/or use of alternative or emergency procedures. Only during rare occasions can the occurrence develop into an accident. The occurrence may indicate deficiencies in the Safety management/quality system. Nuisance to the occupants.	Minor occurrence					
	No direct or low safety impact. Use of good operational practice and/or existing safety barriers to avoid safety impact.	Low effect occurrence					
		Probability of Occurrence	Extremely improbable	Extremely remote	Remote	Reasonably Probable	Frequent
Aviation Risk Assessment Matrix Legend:  Unacceptable  Review  Acceptable Note:	Qualitative definition	Should virtually never occur.	Unlikely to occur, but nevertheless, has to be considered as being possible.	Unlikely to occur, but may occur several times.	May occur once or a few times.	May occur once or several times.	
Severity classification is defined by one or more of the specified criteria. The Probability can be expressed in exposure time, operational cycles, per unit or aircraft movements apart from the normal flight hour expression.	Quantitative definition	< 10 ⁻⁹ per flight hour	10 ⁻⁷ till 10 ⁻⁹ per flight hour	10 ⁻⁵ till 10 ⁻⁷ per flight hour	10 ⁻³ till 10 ⁻⁵ per flight hour	> 10 ⁻³ per flight hour	
	Occurrence time span (World Av.)	Once in a 100 years	Once in 25 years	Once in 10 years	Once a year	0,12 times a year	

Keep it simple

DAMOR-Client

Filer Rediger Vis Indsæt Formater Poster Funktioner Vindue Hjælp

Skriv et spørgsmål

begiv

BEGIVENHED 21849

Dato: 20-03-2007 Klokken: 00:00 Objekt: OY-HUP Sted: EKEB Dancopier 30592

Beskrivelse: Maintenance

Kommentarer:

Event-kodning

Type	Antal	seneste år	ATA_kode
Operational	1365		6220
Event 1: Maintenance	76		
Event 2: Exceedance	169		
Event 3: Human Factors	323		

Bemærkninger fra Q: Aktion: TL

Opfølgingsrapport

Besvar Q

Tilknyttede rapporter

Læs	Rapport nr	Type	Indberetter
	22115	TSR	Dancopier

Alle Høringer af begivenheden

Dato udsendt	Enhed	Bem. fra Q
23-03-2007	TL	Opfølgingsrapport
22-03-2007	TL	Ny begivenhed

Søg Begivenhed:

Søg Rapport:

Besvar høring

Begiv_nr: 21849 Høring_ID: 30592 Udsendt: 23-03-2007 Aktion: TL

Modtag: HENN

Bemærkninger fra Q: Opfølgingsrapport

Enhedens svar:

Klassi Begiv:

Klassi ATM:

ATM indfyld:

SLV-Aktion: Strafs Tilsyn Ingen

Svardato: Besvaret_af:

Svar læst af Q:



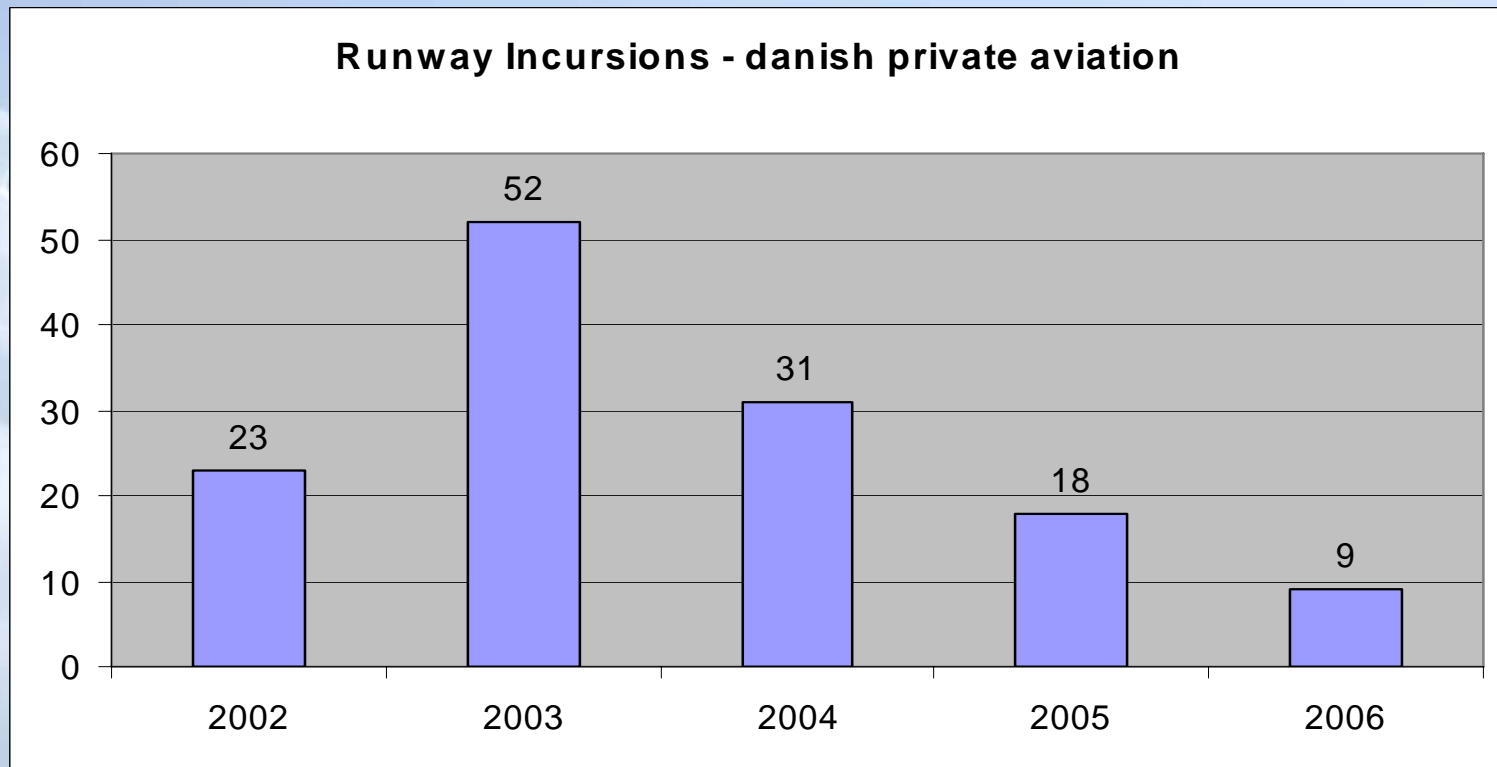
How are the reports used ?

- Internally in CAA:
 - Initially classified by Q+A
 - Every report goes to specialist for final classification
 - Specialist responsible for any required immediate action
 - Central analysis performed regularly to locate areas of interest
 - Areas of interest coordinated between specialists
 - Classification on seriousness to be implemented 2007
 - Fact Based Ressource Allocation (select areas of interest)
- Externally:
 - Special comparative analysis for operators
 - Bird Strike information to airports
 - Information on Runway Incursions to Airport Safety teams

Runway Incursion Campaign

- Broad campaign in autumn 2002 towards operators, managers, ATM, training establishments, aero clubs, quarterly magazine
- Analyses show the problem mainly relevant for leisure flying and confined to a single airport with complicated lay-out and large number of training flights)
- Figures show gradual improvement

Results – Runway Incursions



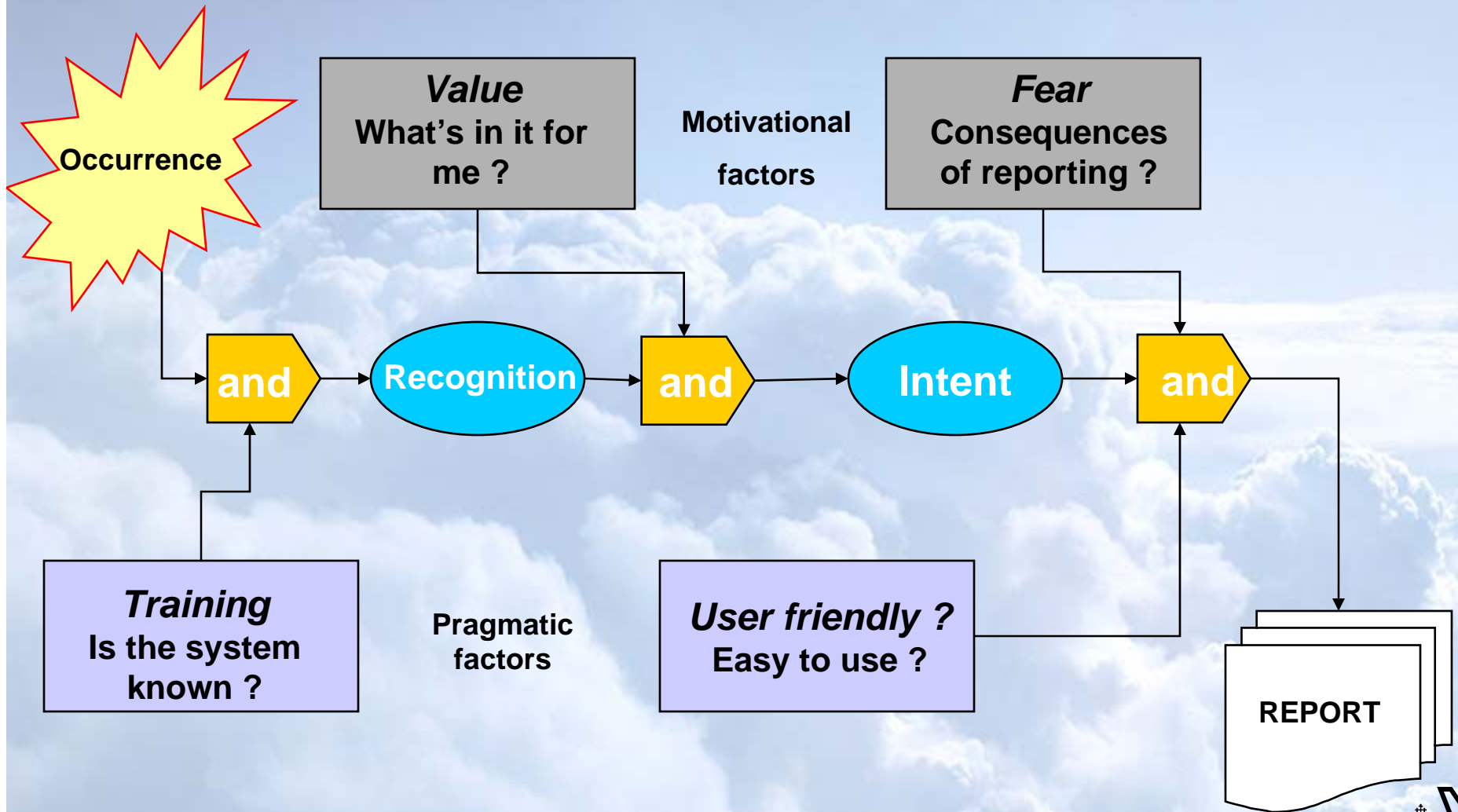
The EU Directive 2003/42/EC

- Adopted June 13th 2003
- Implemented July 4th 2005
- Calls for a mandatory, confidential and non-punitive reporting system
- Directs member states to exchange information from national databases

BL 8-10 vs. 2003/42/EC

- Goes hand in hand
- 2003/42/EC covers also certain serious incidents reportable to AIB's
- BL 8-10 needed slight amendment due to new mandatory reports from Ground Handling and work on air navigation facilities

Factors influencing reporting



Potential benefits

- Identify and fix problems before they turn into costly accidents
- Share lessons learned across communities
- Provide insight into how the system actually works
- Large pool of data enables trend monitoring
- Increased visibility of everyday risk – maintain vigilance
- Employees feel they can make a difference

Potential weaknesses

- Reporting issues
 - Bias
 - What is unsafe ?
- Analysis
 - Depth vs. Breath ?
 - System view or Human Error view ?
 - Taxonomy limited
- Follow-up
 - Difficult to select follow-up (what action is best ?)
 - Are the same old solutions being reiterated ?

**Just because it's difficult
doesn't mean we
shouldn't try!**

Human Error

END

Does ?

The common f

Statens Luftfartsv
Civil Aviation Adm



END