

# European Operators Flight Data Monitoring (EOFDM) Conference KOLN, 23.01.2013

## FDM and Safety Promotion

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# The aim of the presentation

- Establish if Operators convey FDM data and trends in a manner which really determines the improvement of the safety level
- Provide practical examples of dissemination methods
- Provide practical principles to take full benefit of the tools we use

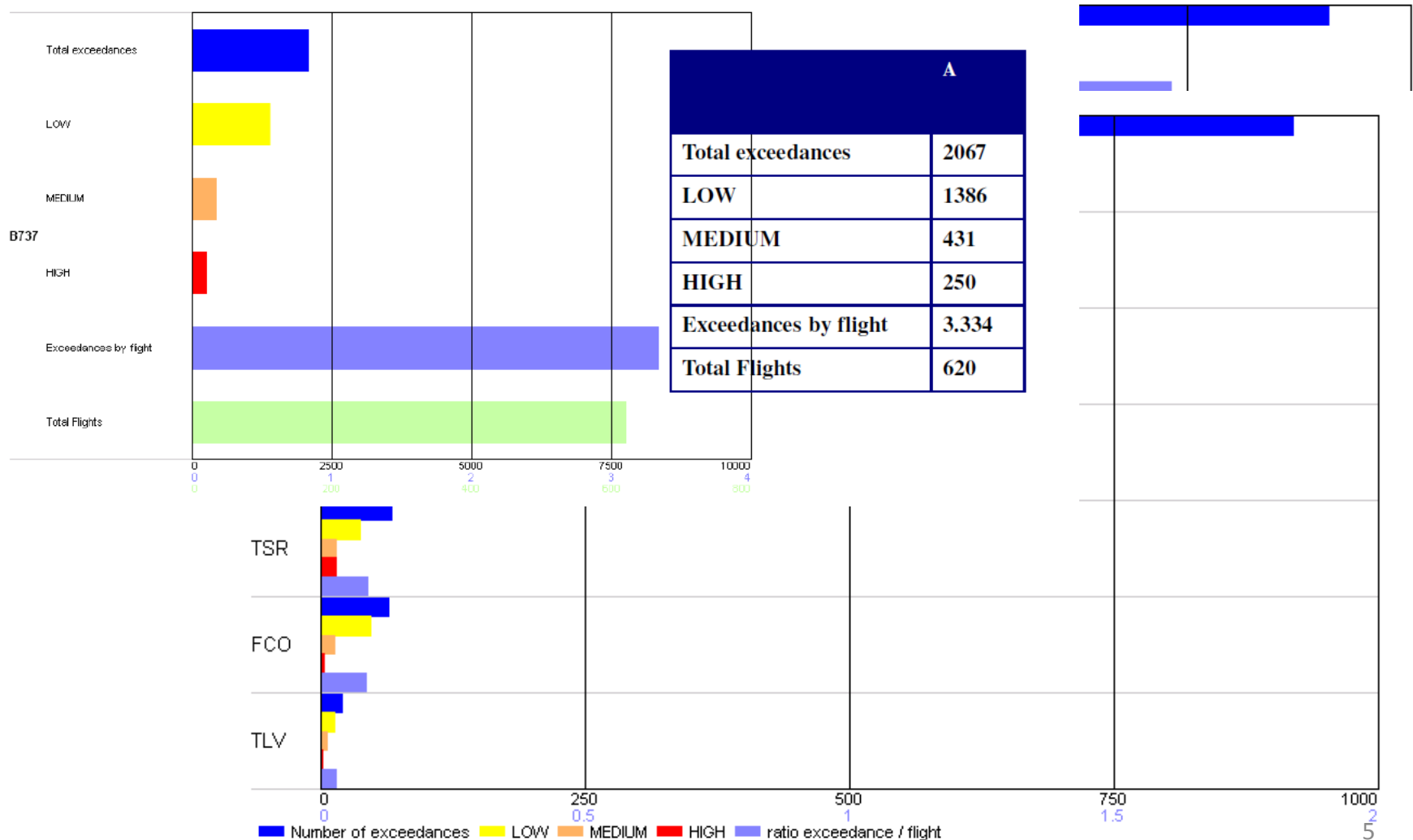
# Is This Visible?



# The “Customer” for FDM

- Who is the customer?
- The CAA?
- Director Flight Operations?
- Crew Training Postholder?
- The CEO?
- Instructors?
- Maybe the pilots?

# The “visible” part of FDM



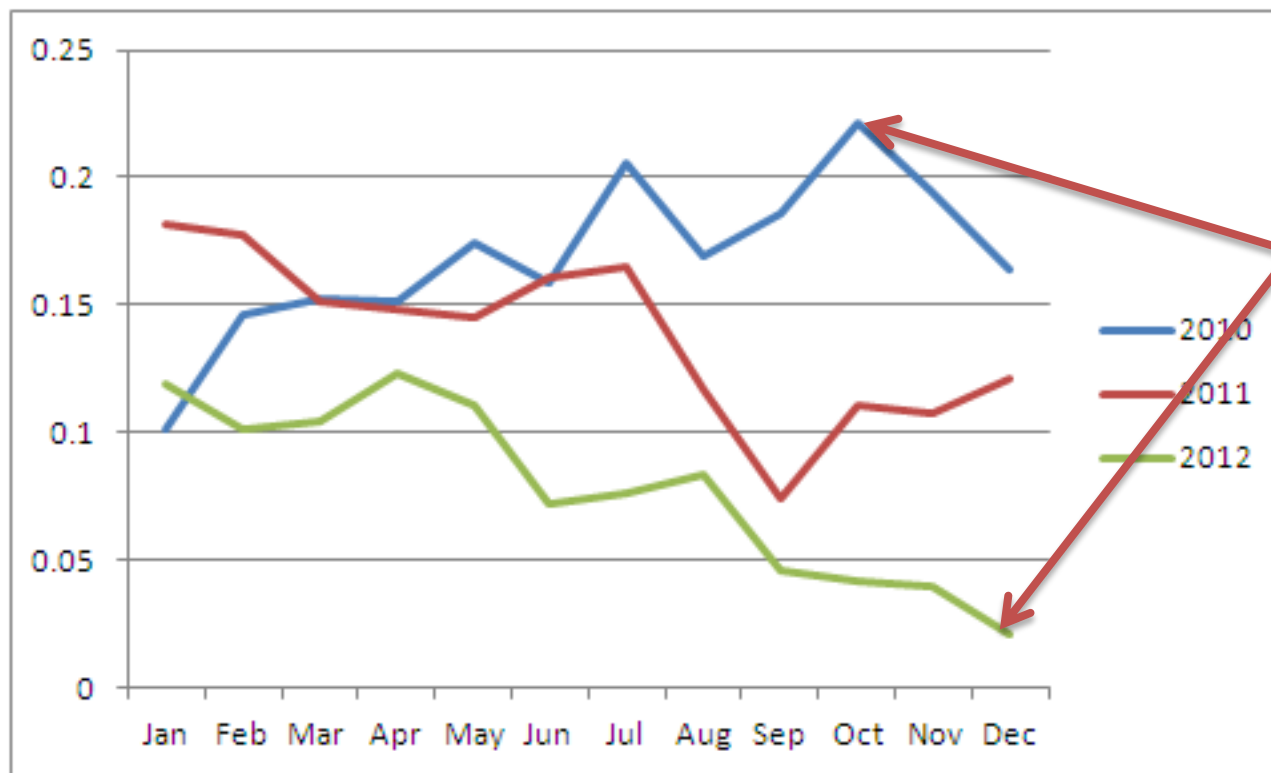
# Tendencies

- FDM for engineering “purism”
- Use the data in all the relevant contexts – not only in the Safety Office!
- FDM is for trends analysis and incident investigations – SMS implementation
- Use limited resources for maximum benefit
- Be constantly aware of the FDM limitations – it cannot do everything
- “Black Swan Events”

# Tendencies (2)

- Tailor FDM data presentation on the “customer” needs
- The data must deliver a message
- The perception of the whole program is based on the way information is promoted
- FDM – to celebrate success as well as flag deteriorating trends

## Event - Long Touchdown

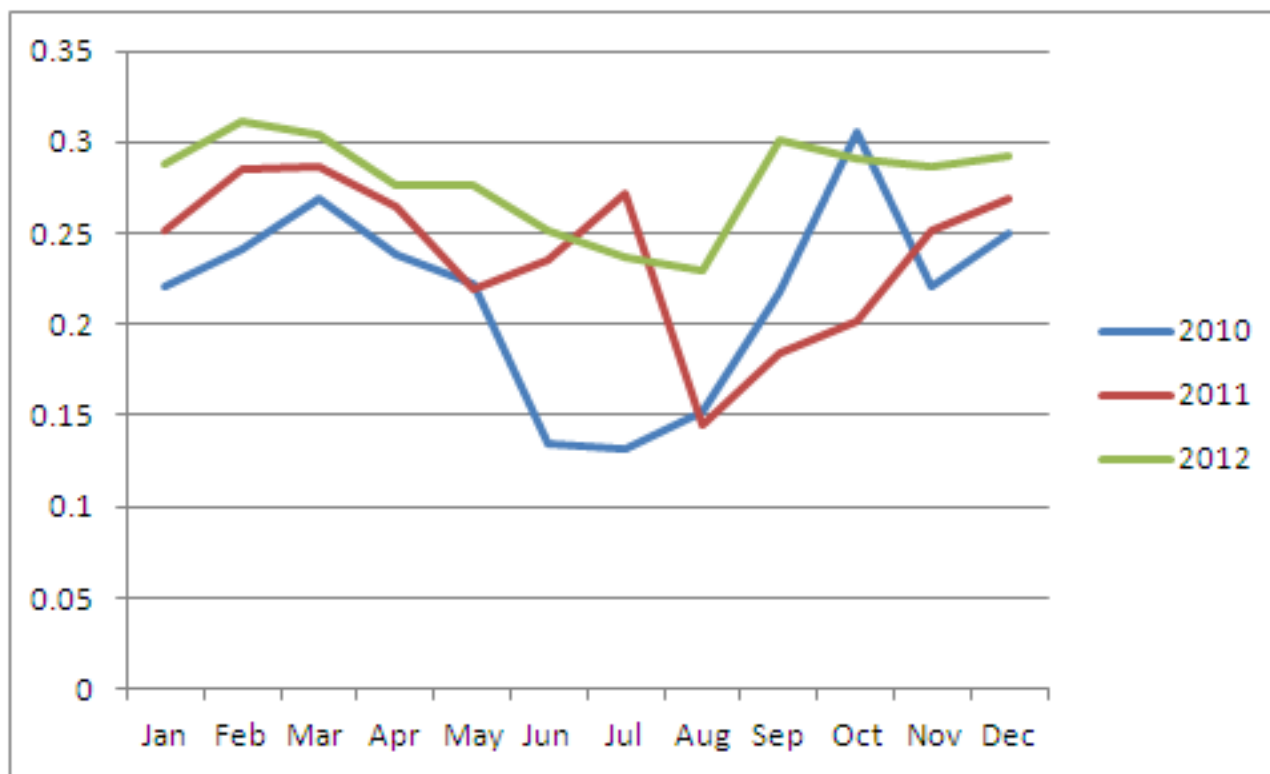


11 times  
reduction  
in 3 years

Event No.	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit
3043	Long Touchdown	DIST_TO_THR (at TD)	750 m	900 m	1050 m



## Event – Delayed Braking at Landing



Event No.	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit
1029	Delayed Braking at Landing	(Time to slow 50kts after slow 10kts since Land)>:	18 s	23 s	28 s

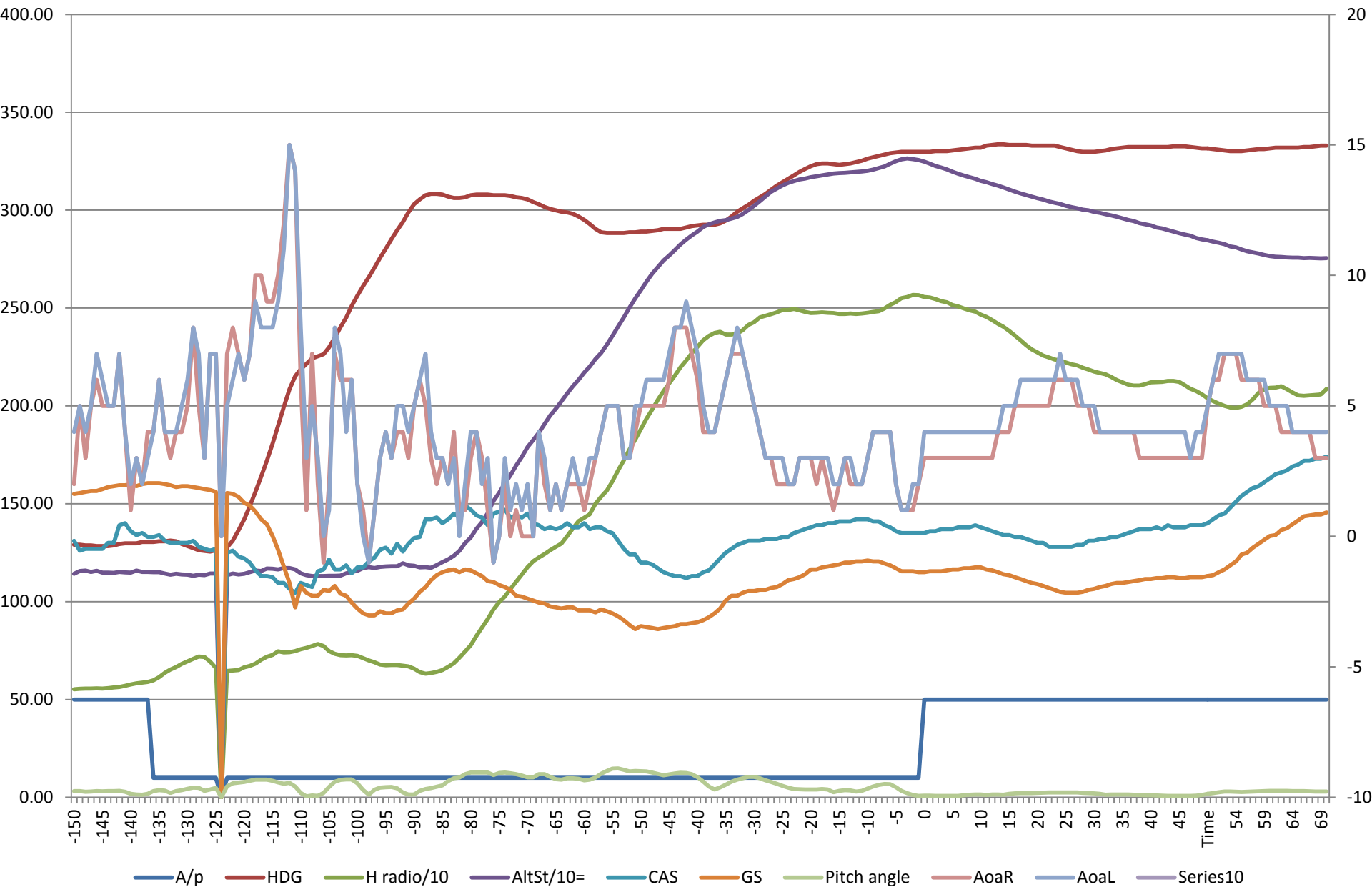
# Common Principles

- Information should be:
  - Clear
  - Intuitive
- Balance the quantity of information provided
- Do not presume everybody understands graphs and tables!
- Use FDM to highlight safety improvements in the operations – by comparing FDM trends with set goals

# Still FDM!

Microsoft Excel window: ROT\_705\_12122012\_VARIANTA2.xlsx

YR-ATI 12/12/2012 Parameter Map: ATR72ROT01-1-0 (v1.08) Format: Basic Derived Parameters (v2.00) Parameters: 37																			
Flight: 705-0 OTP-IAS T/O Frm: 39462 4:10:03 PM Lnd Frm: 40411 5:13:19 PM																			
Frame-Sf	SfCount	Time	Statu	AC_IC	Flight Nu	Current Date	Auto pilot s	Heading	Radio He	Standard	Calibrated	Lowest Se	Ground	AOA_1	AOA_2	CONF (Fla	Gross Weig	WINDIR	WINSPP
				ACIDE	FLIGHT	_DATE	_AP_STATU	_HEADIN	_ALT_RA	_ALT_STC	_CAS	_VLS	_GS	AOA_L	AOA_U	_CONF	_GROSS_W	WINDIR	WINSPP
								rad	ft	ft	kts.s	kts.s	kts.s				t		kts
40189-1	160756	16:57			705	12/12/2012	AP ENG	101.96	2222	2754	185	161.77	206.5	4	3	0	21		23
40189-2	160757	16:57			705	12/12/2012	AP ENG	106.18	2228	2750	184	161.77	206.5	4	4	0	21	291.8	0
40189-3	160758	16:57			705	12/12/2012	AP ENG	110.4	2230	2749	183	161.77	206	4	4	0	21		0
40189-4	160759	16:57			705	12/12/2012	AP ENG	114.27	2211	2748	183	161.77	206	5	4	0	21		0
40190-1	160760	16:57			705	12/12/2012	AP ENG	118.14	2200	2748	182	161.77	209.5	5	4	0	21		23
40190-2	160761	16:57			705	12/12/2012	AP ENG	121.65	2184	2749	181	161.77	210	4	4	0	21	300.94	0
40190-3	160762	16:57			705	12/12/2012	AP ENG	125.17	2138	2750	180	161.77	209	4	4	0	21		0
40190-4	160763	16:57			705	12/12/2012	AP ENG	128.69	2063	2750	179	161.77	209	4	4	0	21		0
40191-1	160764	16:57			705	12/12/2012	AP ENG	131.85	2007	2749	178	161.76	210	4	4	0	21		28
40191-2	160765	16:57			705	12/12/2012	AP ENG	134.31	1947	2749	177	161.76	208.5	4	4	0	21	296.72	1
40191-3	160766	16:57			705	12/12/2012	AP ENG	136.77	1883	2750	177	161.76	208.5	4	3	0	21		1
40191-4	160767	16:57			705	12/12/2012	AP ENG	138.53	1845	2750	175	161.76	209	4	4	0	21		1
40192-1	160768	16:57			705	12/12/2012	AP ENG	140.29	1832	2748	175	161.76	208.5	4	3	0	21		32
40192-2	160769	16:57			705	12/12/2012	AP ENG	141.69	1826	2746	175	161.76	208	4	3	0	21	303.75	1
40192-3	160770	16:57			705	12/12/2012	AP ENG	142.75	1820	2745	174	161.76	208	4	4	0	21		1
40192-4	160771	16:57			705	12/12/2012	AP ENG	144.16	1832	2740	172	161.76	207.5	4	4	0	21		1
40193-1	160772	16:57			705	12/12/2012	AP ENG	145.21	1831	2738	175	161.76	207	4	4	0	21		33
40193-2	160773	16:57			705	12/12/2012	AP ENG	145.91	1843	2732	172	161.76	206	4	4	0	21	306.56	1
40193-3	160774	16:57			705	12/12/2012	AP ENG	146.62	1852	2732	172	161.76	206.5	4	4	0	21		1
40193-4	160775	16:57			705	12/12/2012	AP ENG	147.32	1868	2731	170	161.76	205.5	5	4	0	21		1
40194-1	160776	16:57			705	12/12/2012	AP ENG	148.02	1883	2726	170	161.76	205	4	4	0	21		33
40194-2	160777	16:57			705	12/12/2012	AP ENG	149.08	1903	2726	169	161.76	204	5	4	0	21	310.08	0



# Common principles

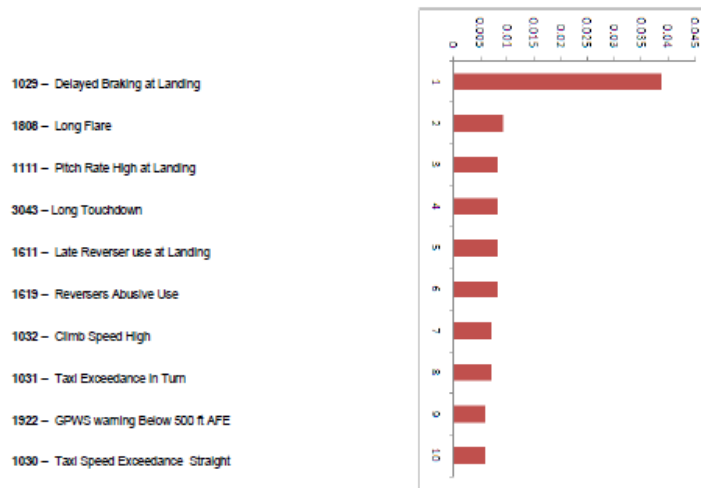
- The “ideal” tool/system would be able to bring immediate feedback to the crew – video feedback, events feedback
- Crews should have the possibility to have access to the data of their flights
- Integrate FDM into SMS: ASR, investigations etc.
- States should promote FDM information as a Safety Promotion tool

# How to promote?

- Safety Bulletins
- Safety Bilboards
- Safety Emails
- Different training instances – Operator Conversion Course, Recurrent training, Changing type of aircraft flown
- Flight Safety Committee
- Through training specialists

TOP 10 FLIGHT DATA MONITORING HIGH RISK EVENTS B737 FLEET DECEMBER 2012

Exceedances (Graphic)



Exceedances (Numeric)

Event No.	Event Name	*High Count	**High Ratio	Trend
1029	Delayed Braking at Landing	33	0.0387	↑
1808	Long Flare	8	0.0093	↑
1111	Pitch Rate High at Landing	7	0.0082	NEW
3043	Long Touchdown	7	0.0082	↓
1611	Late Reverser use at Landing	7	0.0082	↓
1619	Reversers Abusive Use	7	0.0082	↑
1032	Climb Speed High	6	0.0070	↑
1031	Taxi Exceedance in Turn	6	0.0070	↓
1922	GPWS warning Below 500 ft AFE	5	0.0058	=
1030	Taxi Speed Exceedance Straight	5	0.0058	NEW

\*High Count = Nr. of Red Events (Recorded)

\*\*High Ratio = Red Events/Nr. of Flights (Recorded)

Event No.	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit
1029	Delayed Braking at Landing	Time to slow 50kts >=:	23 sec	25 sec	30 sec
1808	Long Flare	Time from 30ft to TD >=:	12 sec	14 sec	16 sec
1111	Pitch Rate High at Landing	PITCH_RATE>TOL-0s	2"/sec	2.5"/sec	3"/sec
3043	Long Touchdown	_DIST_TO_THR_CONV >=:	750 m	960 m	1050 m
1611	Late Reverser use at Landing	NO REV DEPLY UNTIL 50 kts	7 sec	10 sec	0 sec
1619	Reversers Abusive Use	80%NT at reverse still applied at CAS >=:	55 kts	50 kts	40 kts
1032	Climb Speed High	VTKE>TOL=>1s	40 kts	50 kts	60 kts
1031	Taxi Exceedance in Turn	GS >TOL-0s	15 kts	18 kts	21 kts
1922	GPWS warning Below 500 ft AFE	Any GPWS Warning mode disc ON	NONE	NONE	Warn
1030	Taxi Speed Exceedance Straight	GS>TOL-0s	32 kts	35 kts	40 kts

# Conclusions

- We need to bring FDM closer to the pilots
- Do not over exaggerate with the analysis – don't get lost by drilling into the data
- Design the way information is promoted with the customer requirements in mind
- We need to check if important aspects have been understood by the final users – pilots and managers



# QUESTIONS?



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