

Integration of FDM into an Operator SMS



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Long Landings

- Significant number of “long landings” – long touchdown
- Touchdown outside the touchdown zone
- All runway excursion type of accidents start with an unstable approach continued with landing

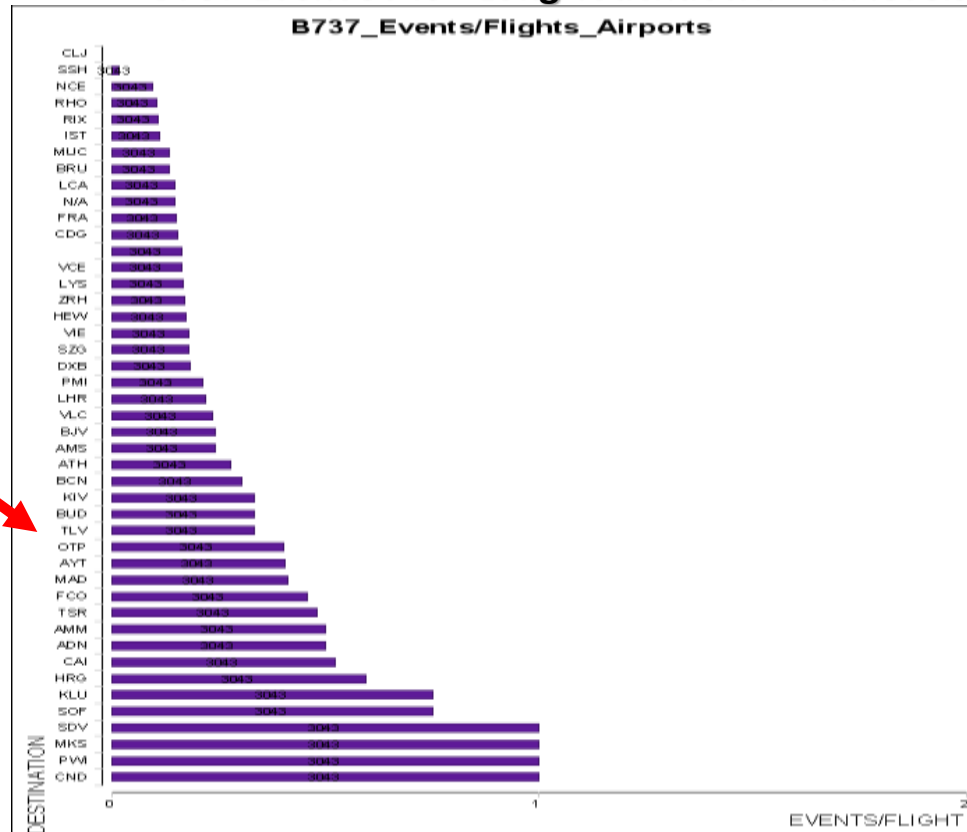


Why does it happen?

- “Smooth” landings
- Cultural issue
- Tradition
- Long runways
- Lack of high speed taxiways
- Taxiway exits not at the proper distance from threshold
- Minimize runway occupancy time

Where does it happen?

B737 Event 3043 - Long Touchdown – all levels included



Airports with long runways or with improper taxiways to vacate the runway

Risk Assessment



Hazard Identification and Risk Management Safety Risks

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Risk probability	Risk severity				
	Catastrophic A (5)	Hazardous B	Major C (3)	Minor D (2)	Negligible E (1)
Frequent (5)	5A (25)	5B (20)	5C (15)	5D (10)	5E (5)
Occasional (4)	4A (20)	4B (16)	4C (12)	4D (8)	4E (4)
Remote (3)	3A (15)	3B (12)	3C (9)	3D (6)	3E (3)
Improbable (2)	2A (10)	2B (8)	2C (6)	2D (4)	2E (2)
Extremely improbable (1)	1A (5)	1B (4)	1C (3)	1D (2)	1E (1)

Figure 3.3.4 Safety Risk Assessment Matrix

Risk Mitigation

- Training
 - Initial
 - Recurrent
- Gap Analysis
- ATC involvement
- Airport authorities
- Continuous Data Sharing



Monitoring

- - Airfase Reports
- - Trend analysis
- - Safety Targets
- - Simulator reports
- - Flight Safety Committee Meetings

Targets / Achievements



TAROM Safety Targets 2011
(According to APFSP-SMSM Ch. 3.4 SMS Safety performance)

SG. 8161
Data 28-11-2011

Planned

Events (FLT)	No per year (35000 flights)	Rate (1000 flights)
Wing Tail Strike	4	0.11
Hard / Heavy landing	20	0.57
Runway incursion	6	0.17
Runway excursion	1	0.03
High Speed Rejected Takeoff	1	0.03
TCAS RA	2	0.06
Long touchdown	1990	56.86
GPWS warning below 500 ft AFE	200	5.71



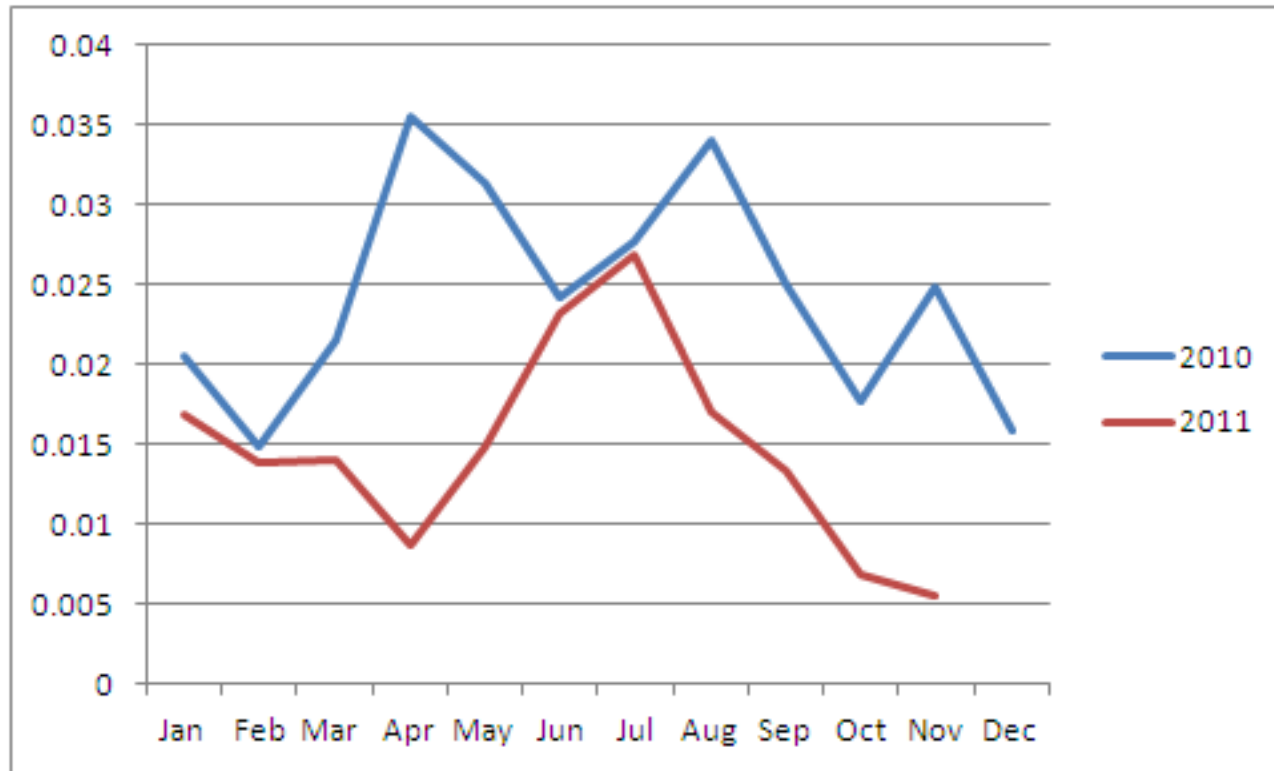
TAROM Safety Targets 2011
(According to APFSP-SMSM Ch. 3.4 SMS Safety performance)

Realised

Events (FLT)	No per year	Jan-Sep	Rate 1000 flights	
Wing Tail Strike	4	0	0.11	0.00
Hard / Heavy landing	20	0	0.57	0.00
Runway incursion	6	0	0.17	0.00
Runway excursion	1	0	0.03	0.00
High Speed Rejected Takeoff	1	1	0.03	0.04
TCAS RA	10	2	0.29	0.07
Long touchdown	1990	1000	56.86	36.58
GPWS warning below 500 ft AFE	200	145	5.71	5.30
Turbulence Injury	10	0	0.29	0.00
Unsatisfactory training evaluations	15		0.43	

Hazard identification and Monitoring

B737 Event 3043 - Long Touchdown



Event No.	Event Name	Trigger Condition	Low Limit	Medium Limit	High Limit
3043	Long Touchdown	_DIST_TO_TH R_CONV>=:	750 m	950 m	1050 m

Safety Promotion

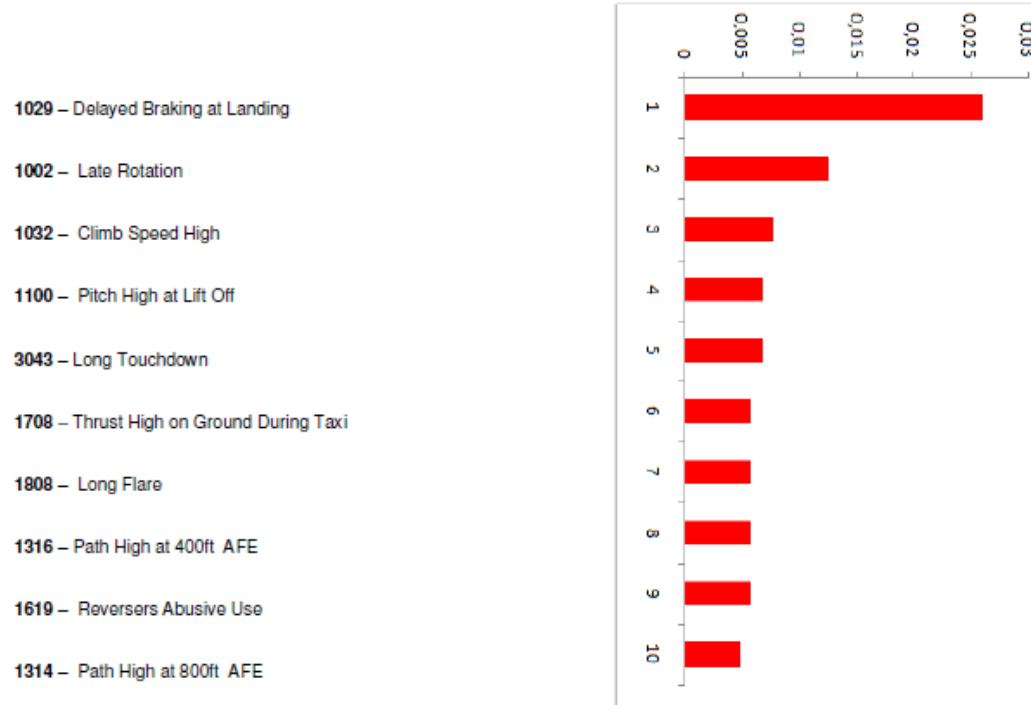
- Reduction of probability is possible
- Insist on the issue in all Flight Safety Committees
- Top 10 Event Reports
- FDM Monthly reports
- Safety target completion
- Safety Emails
- Safety Info



Safety Promotion

TOP 10 FLIGHT DATA MONITORING HIGH RISK EVENTS B737 FLEET OCTOBER 2011

Exceedances (Graphic)



Exceedances (Numeric)

Event No.	Event Name	*High Count	**High Ratio	Trend
1029	Delayed Braking at Landing	27	0.0261	↑
1002	Late Rotation	13	0.0125	↑
1032	Climb Speed High	8	0.0077	New
1100	Pitch High at Lift Off	7	0.0067	New
3043	Long Touchdown	7	0.0067	↓
1708	Thrust High on Ground During Taxi	6	0.0058	↓

Annex 1

Long Landings

- Aterizarile lungi – in afara touchdown zone - pot determina runway excursions
- Statisticile arata ca la OTP se inregistreaza cele mai multe aterizari in afara touchdown zone, la toate tipurile de aeronave TAROM
- OMA G/B 8.4 - 4.2.2 prevede “the desired touchdown point lies at a distance between 300 meters to 600 meters from the landing threshold”
- Toate aterizarile trebuie realizate in interiorul touchdown zone



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Tarom Safety & Quality



Conclusion

- FDM can be successfully used to track and reduce risks

