

WILDLIFE STRIKE

OPERATIONAL AND ECONOMICAL IMPACT FOR AN AIRLINE MAJOR

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ALITALIA GROUP has an operating fleet of 137 aircraft, among the most modern in Europe (6,5 years of average lifetime)

Long Haul B777-200 - A330-200

Medium Haul A319 - A320 - A321

Regional E175 - E190

ALITALIA PROFILE – DESTINATIONS

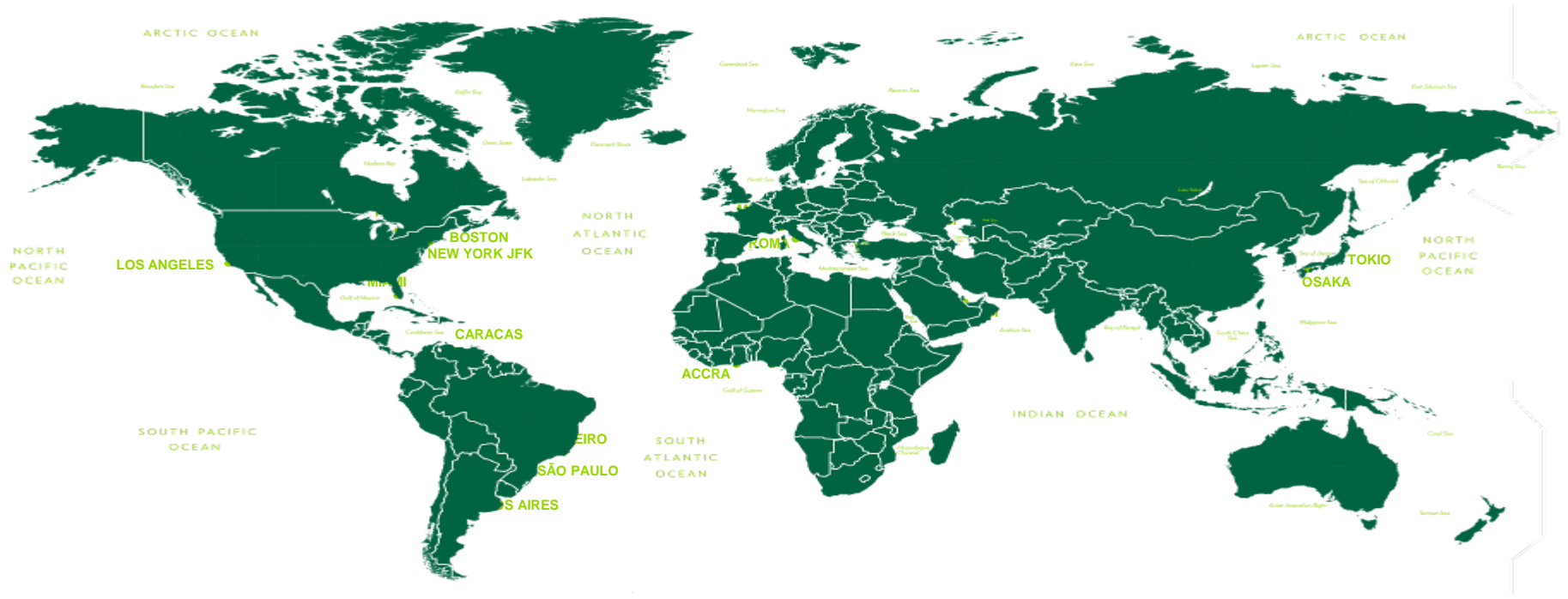


DESTINATIONS 83 (IN ITALY 22)

ROUTES 121

FLIGHTS 220.000

● Destinations





DESTINATIONS IN ITALY 22

● Destinazioni servite da Alitalia





15 January 2009
New York
Flight 1549
Airbus A320-214
Hudson river ditching
Double Engine Loss of
Thrust after
encountering a Flock of
birds (Canadian Goose)

Impact information: Climb phase , 2,800 ft, **190 KIAS**



15 November 2008
Ciampino
Flight 4102
B737-800
Emergency landing
following multiple bird
strikes (starlings)

Impact information: Approach phase

EASA Bird Strike Damage & Windshield Bird Strike Final Report [ATKINS - December 2009]

- ✓ Bird strikes are a relatively rare cause of accidents, representing 0.3% of the total aircraft Fatal Accident Frequency Rate (for western-built jet 5-years average is 20 fatal accidents per year)
- ✓ **Kinetic Energy at impact ($KE = \frac{1}{2}mV^2$) is a better indicator** of damage likelihood than bird mass. The proportion of strikes with KE above the certification value appears to be a useful safety indicator
- ✓ Bird strikes above the certification limits for CS-25 aircraft is around 0,3%. For fixed wing aircraft the few accidents that have occurred are in the range 2,7 to 6,6 times the certification value
- ✓ 28% of strikes reported involved multiple birds. Non-engine regulations currently contain any requirements relating to multiple bird strikes
- ✓ Given the reported level of accidents, the bird strike requirements in **CS-25**, and CS-29 are currently providing an adequate level of safety; not the same for CS-23 and CS-27.



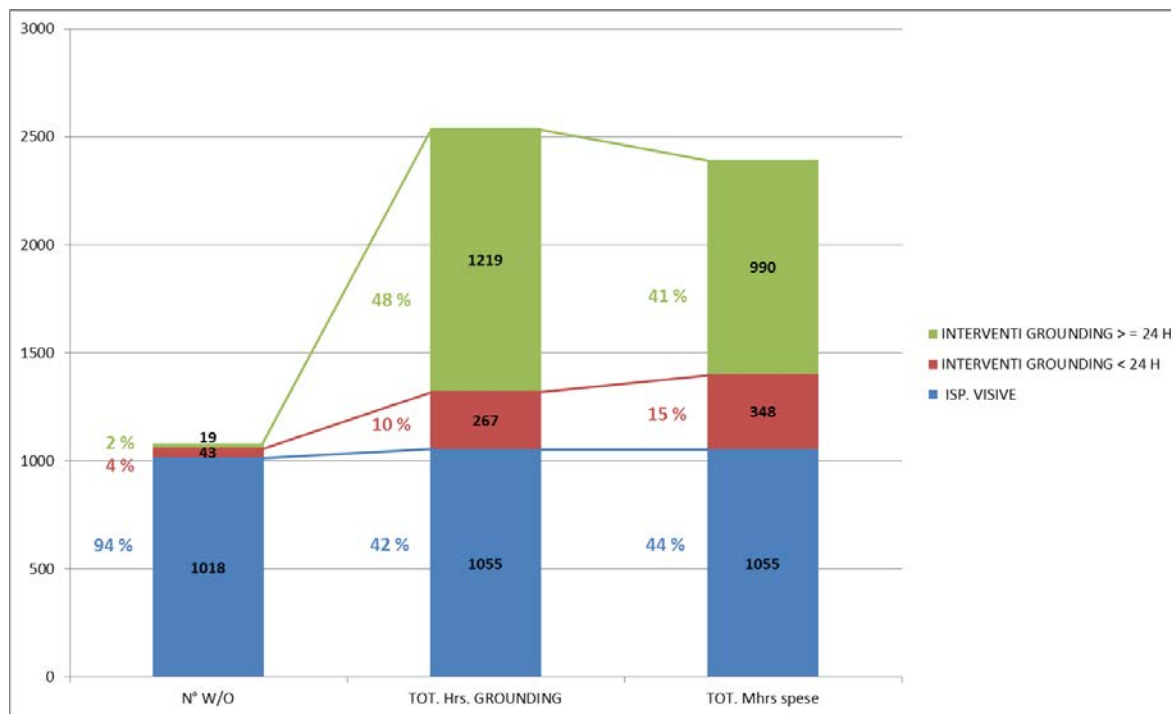
PILOTS REPORTS

	2011	2012	2013 (9m)
Voluntary Reports	618	621	436
MORs (with damage)	25	28	18
TOT	643	649	454

- ✓ 1 Bird Strike reported every 300 flights
- ✓ 1 Bird Strike with damages every 6,000 flights



MAINTAINANCE DATA OCT 2011 / OCT 2012





- ✓ 1,080 Work Orders due to wildlife strike consequences
- ✓ 99% Birdstrike
- ✓ 1,018 (94%) limited to Visual Inspection (less than 1 Hour)
- ✓ 43 (4%) ground time between 1 and 24 hrs (10 hrs on average)
- ✓ 19 (2%) more than 24 hrs (65 hrs on average)
- ✓ Aircraft total ground time **2,540 Hours**
- ✓ **EXACT BILL HARD TO CALCULATE , FOR SURE MILLIONS OF €**



BIRDSTRIKE RATE FOR MAJOR NATIONAL DESTINATIONS

Aeroporto	2010			2011			Gen_Ago 2012			2010_2012		
	N°Eventi	cicli	Incidenza ‰	N°Eventi	cicli	Incidenza ‰	N°Eventi	cicli	Incidenza ‰	N°Eventi	cicli	Incidenza ‰
FCO	225	78252	2,88	215	78961	2,72	180	49961	3,60	620	207174	2,99
LIN	69	31729	2,17	72	34332	2,10	56	22566	2,48	197	88627	2,22
NAP	26	11411	2,28	23	11634	1,98	23	7669	3,00	72	30714	2,34
CTA	33	8686	3,80	41	9058	4,53	38	6242	6,09	112	23986	4,67
MXP	4	8141	0,49	14	8504	1,65	8	6394	1,25	26	23039	1,13

The data includes all the events occurred above and below the 300ft



ENCOURAGING BIRD STRIKE REPORTING

- ✓ A significant percentage of Bird Strike are not reported
- ✓ Quality of reports: there is room for improvement
- ✓ Potential underestimation of the hazard
- ✓ Reporting is the fuel of Safety Management System
- ✓ No Reports = No Data
- ✓ No Data = no possibility to “chase” airports for improving wildlife control



ENFORCING STRICT ADHERENCE TO THE 250 kt RESTRICTION BELOW 10,000 Ft

- ✓ Birds encounters increase at low altitude
- ✓ Airframes and engines are certified at limited energy level
- ✓ Impact energy (Kinetic) **KE = $\frac{1}{2} \times m \times V^2$**
- ✓ Certification Bird Mass is 4 lb = **1.82 kg**
- ✓ Certification Spd (for A320) = 350 kts = 180.1 m/s
- ✓ Canadian Goose Average Weight = **3.2 kg**

An impact with an avg Canadian Goose is outside certification limits at
270 kts

**Thank You for
your attention
Questions?**

ROMA 27/05/2013





Fly Safe 24/7