

ICAO / ASPA de Mexico

Mexico City 7-8 May, 2012

don Bateman

All Accidents 2012 vs. 2011

Total Accidents: 75 world wide---92 in 2011
13 IATA Members--34 in 2011

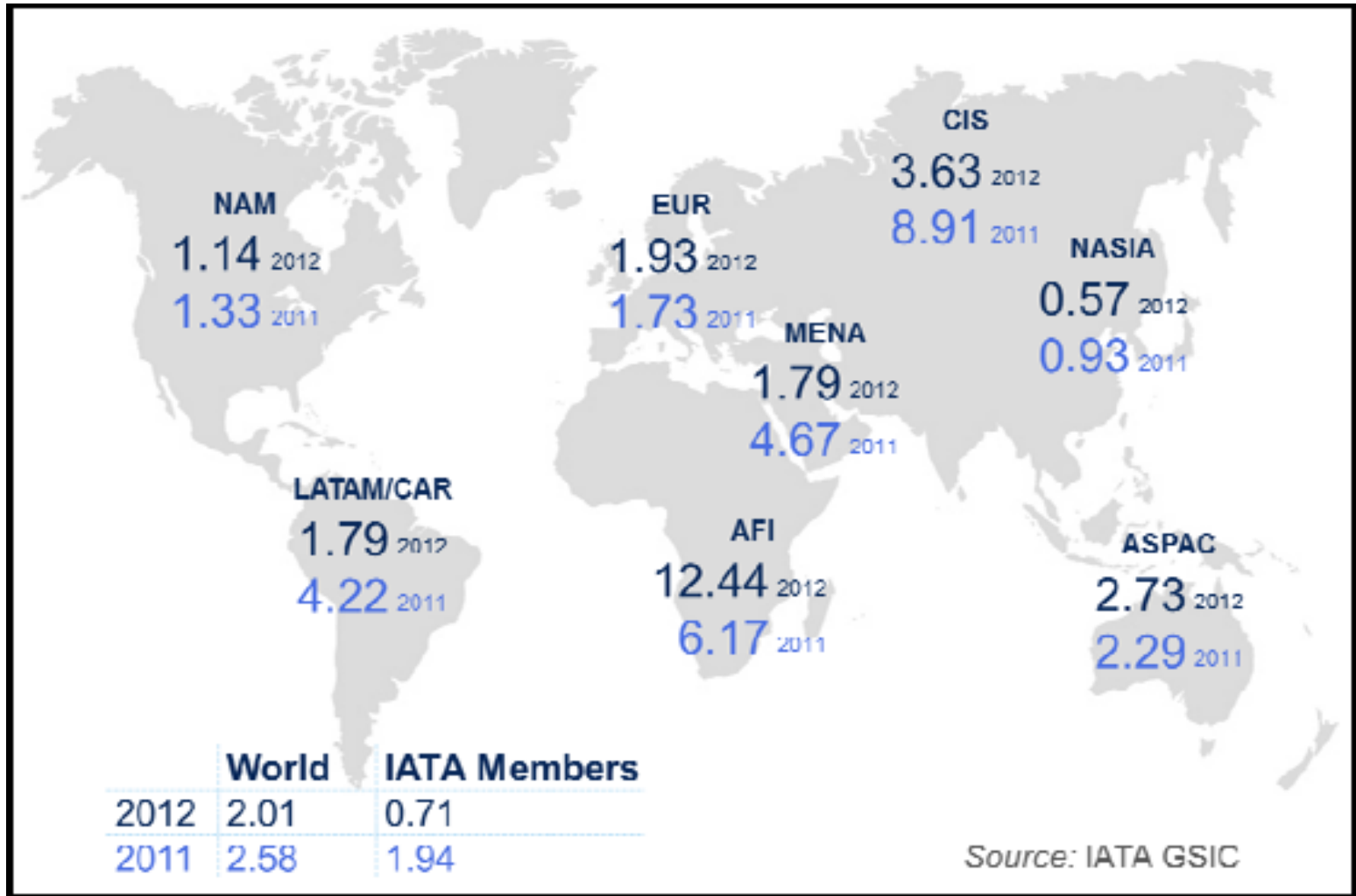
Western Built Jet: 6-----11 in 2011

Total Fatal Accidents: 15-----22 in 2011

Total Fatalities: 414----- 486 in 2011

Source: IATA Safety

Total Accident Rate per Operator Region 2012



Air Passenger Flight Safety today is one of the safest means of travel

In 1932---there was 1 fatal accident every 20,000 departures

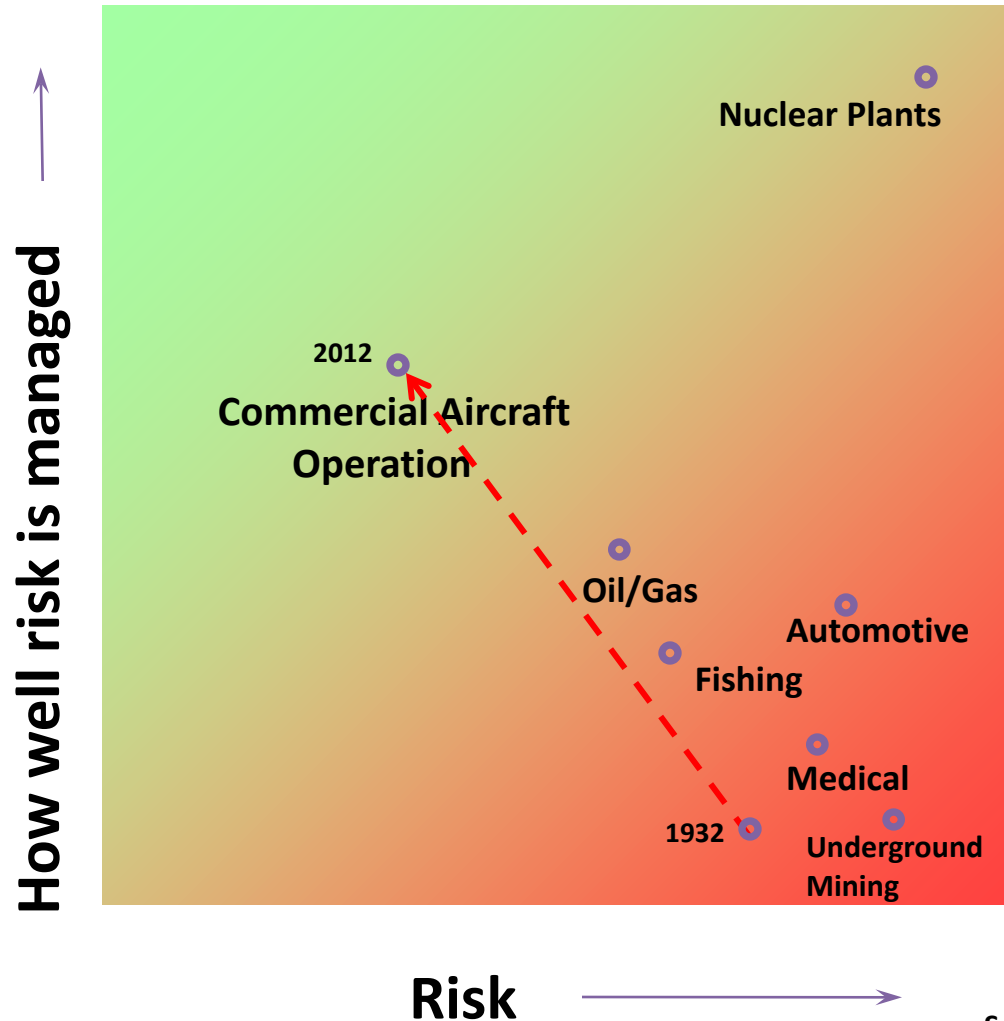
In 2012—there was 1 fatal accident every 2,500,000 departures*

For the USA-> 1 fatal accident every 10,000,000 departures last three years

**Source: Jet Information Services Inc/ Boeing/IATA*

An improvement of greater than 125 times over 80 years

Relative Risk of Aviation as Compared to Other Industries



Source: original suggestions from Jim Burin and others

How did we get so good?

- Pilots-- Training and Continuous improvements from experience-
- Flight Standards
- Jet Engine
- Improvements in Structural design---flight controls
- Ground Aids-Communication and Navigation
- Maintenance Improvements and Training
- Air Traffic Control
- Evolving Technologies
- A Free Press
- Legal Liability

Technology has continued to allow flight improvement in safety systems --

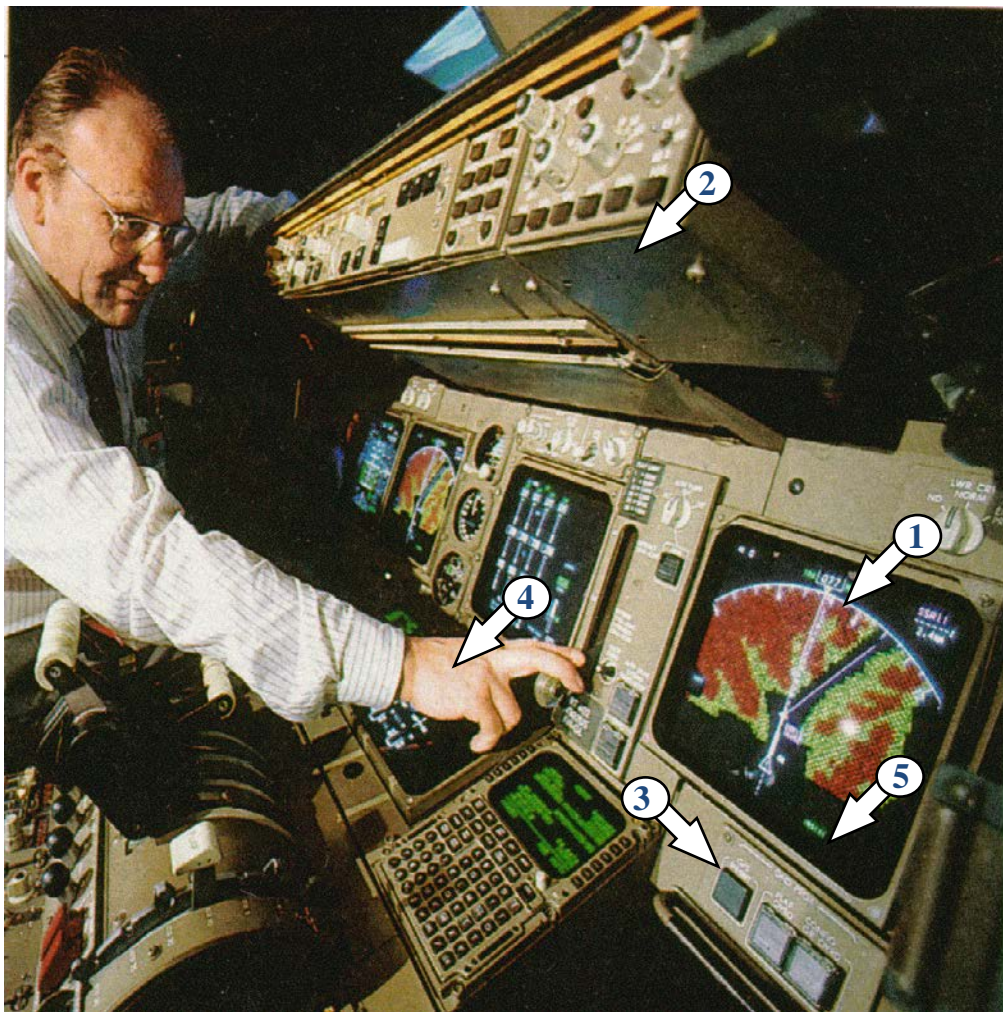
- Digital Technology
- Flash Memory
- Graphics Generators for Displays

In 1956, 5 MB Digital Memory Technology: Memory Storage cost \$ 5 Million

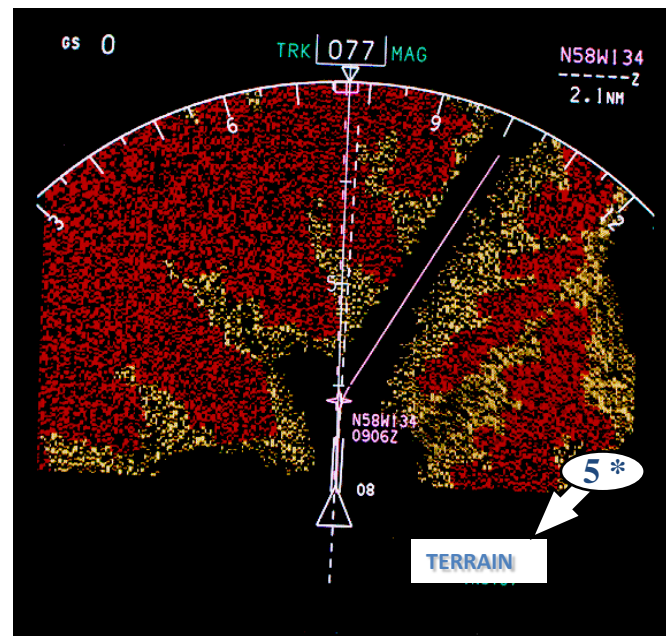


*Today: 20 GB in a
memory stick
----sells for \$10 US*

EGPWS : Integrated Solution



Automatic monitoring of position accuracy and enhanced function inhibiting / un-inhibiting

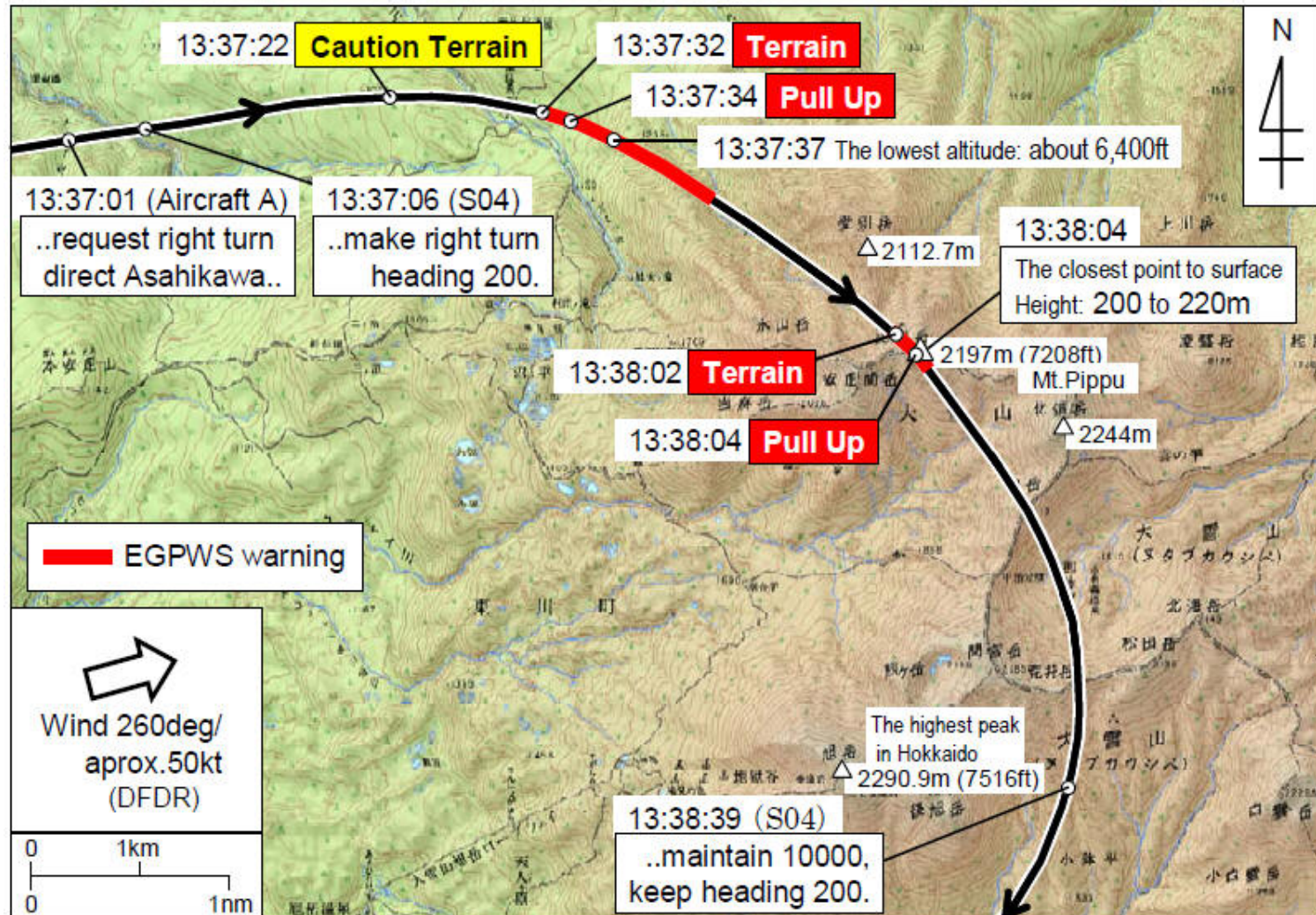


* White background not standard; done to make text easy to photocopy

- ① Software update for EFIS Symbol Generators
- ② Add **TERR** select switch to EFIS Control Panel
- ③ Add **INHIBIT / OVRD** switch to instrument panel
- ④ Display **INHIBIT / OVRD & FAIL / INOP** messages on EICAS or ECAM
- ⑤ **TERRAIN** / **TERRAIN** (Amber) / **TERRAIN** (Red) on ND; **TERRAIN** (Amber) or **GNDPROX** (Amber) and **TERRAIN** (Red), **GNDPROX** (Red) or **PULLUP** (Red) on PFD

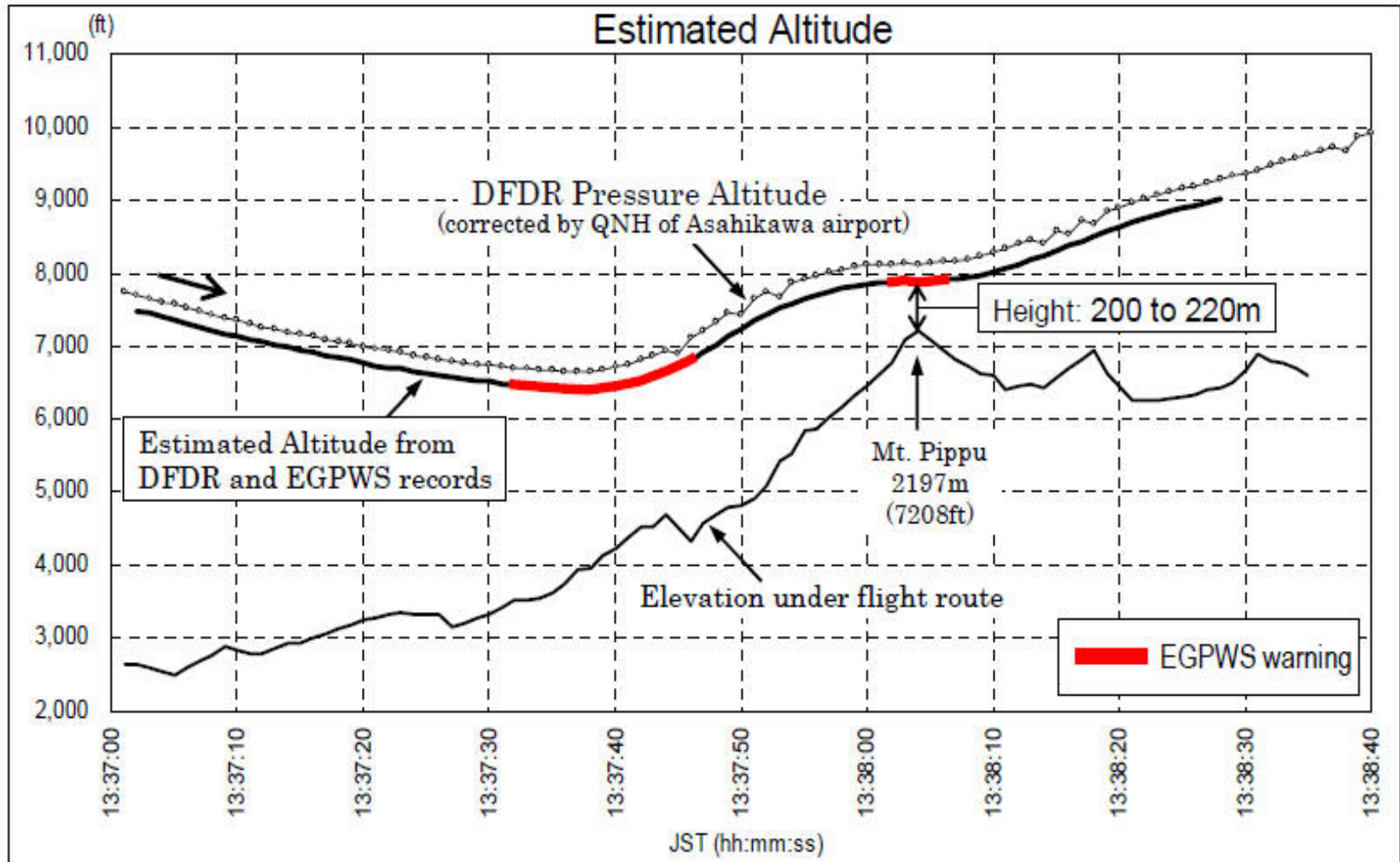
B-737-8 Asahikawa Japan Incident

October 26, 2010 –chart from JACB Report



1:50,000 scale Topographic Map by Geographical Survey Institute

Chart from JCAB Report

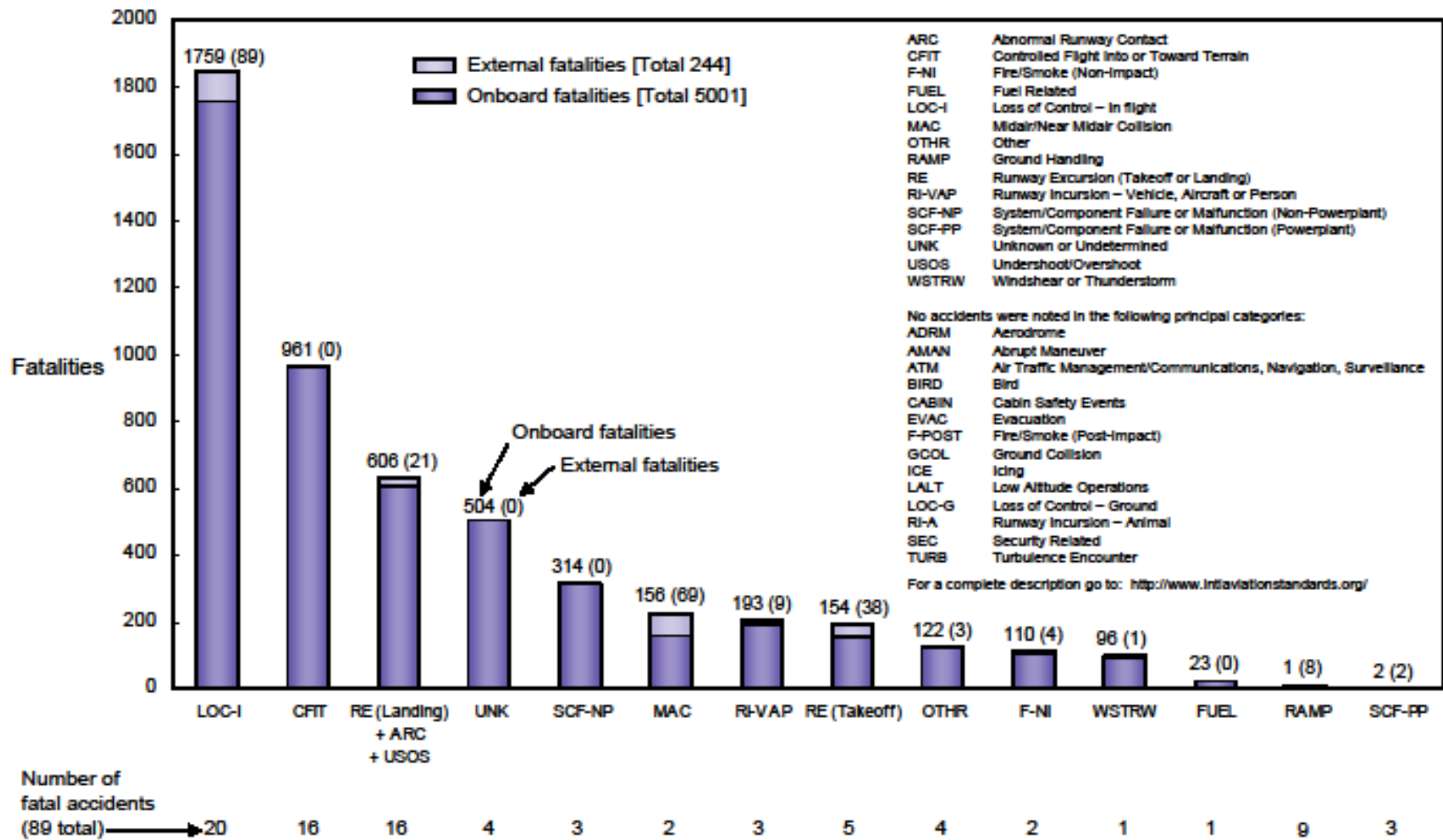


Minimizing CFIT Risk with E-GPWS

- **SOP:** Pilots need to keep a Terrain Display up especially at Take-off and on Initial Approach
- Operators need to use “PEAKS” to detect premature descent clearances---safe drift downs
- Operators need the Latest Software (Free)
- Operators need to use GPS position data
- Operators need to use latest Databases (free) up to date
 - SOP update at Level A Maintenance*
 - Unwanted warnings significantly reduced*
 - Increased warning times when truly needed*

Fatalities by CAST/ICAO Common Taxonomy Team (CICTT) Aviation Occurrence Categories

Fatal Accidents – Worldwide Commercial Jet Fleet – 2000 Through 2009



Note: Principal categories as assigned by CAST.



The Big Risk today is Loss of Control in Flight

- *Colgan Air -CAL flight 3407 Accident*

*Families drove U.S. Public Law 111-216 with Section 208---Stall-
Pusher Training FAA AC 120-109 -other Standards / Sections
concern pilot records--oversight--pairing--fatigue—requires
minimum experience of 1,500 hrs --SMS--*

- *ICATEE Strategic Plan—Pushing Upset Recovery Training*

*For spatial disorientation experience---I believe as an example, there is a need for
simple low cost training aids such as a Barany chair and a blind fold---*

Loss of Attitude Control—

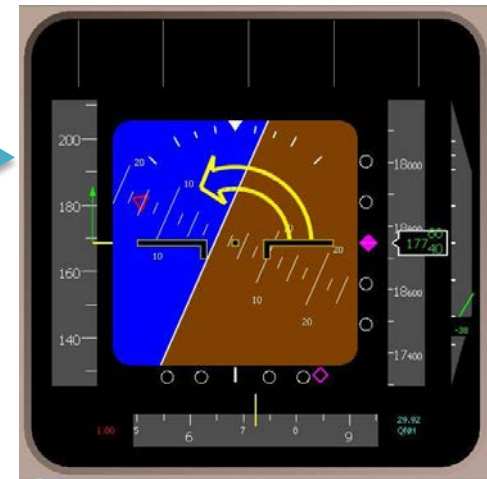
One Simple Practical Solution: *Add a Recovery Aural to the E-GPWS and a Recovery Arrow on EFIS ADI Display*

BANK ANGLE! BANK ANGLE! (existing)

ROLL LEFT! ROLL LEFT! (new)



Roll Recovery Arrow



**Software hosted in MK V E-GPWS
Computer**

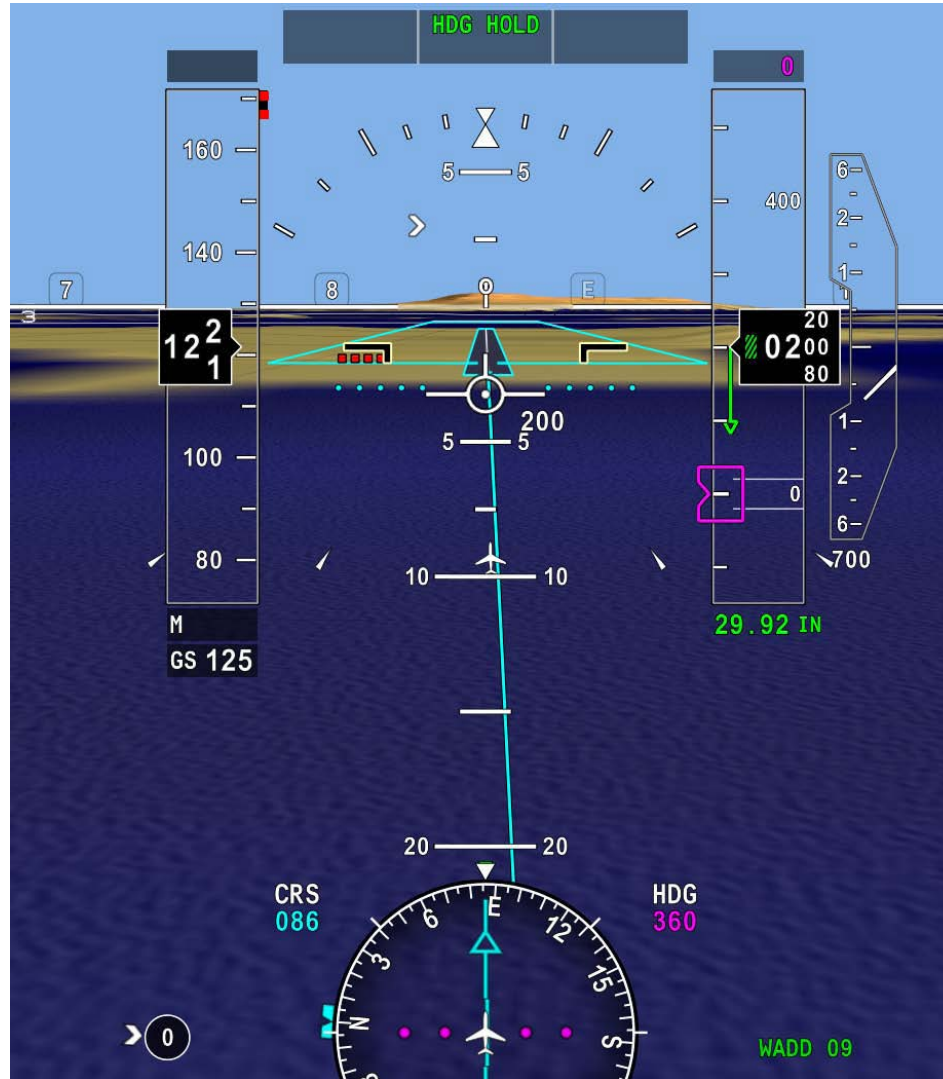
Arrow hosted on the Attitude Display via DEU

Status: Evaluation on Eco Demonstrator and B-737 Cab using Red Label Software

New Advanced Display: Synthetic Vision Attitude



Display of Going in Short of Runway

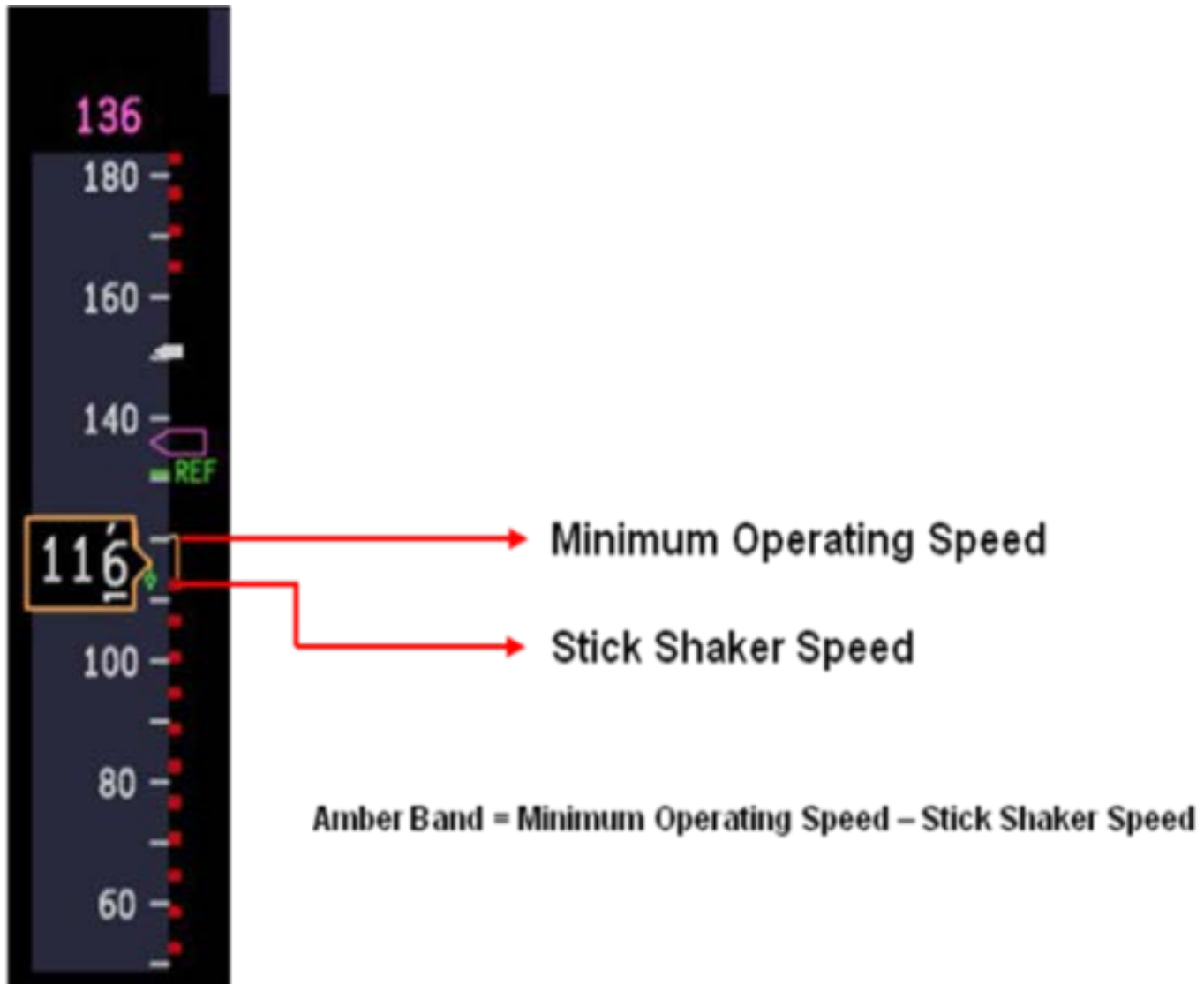


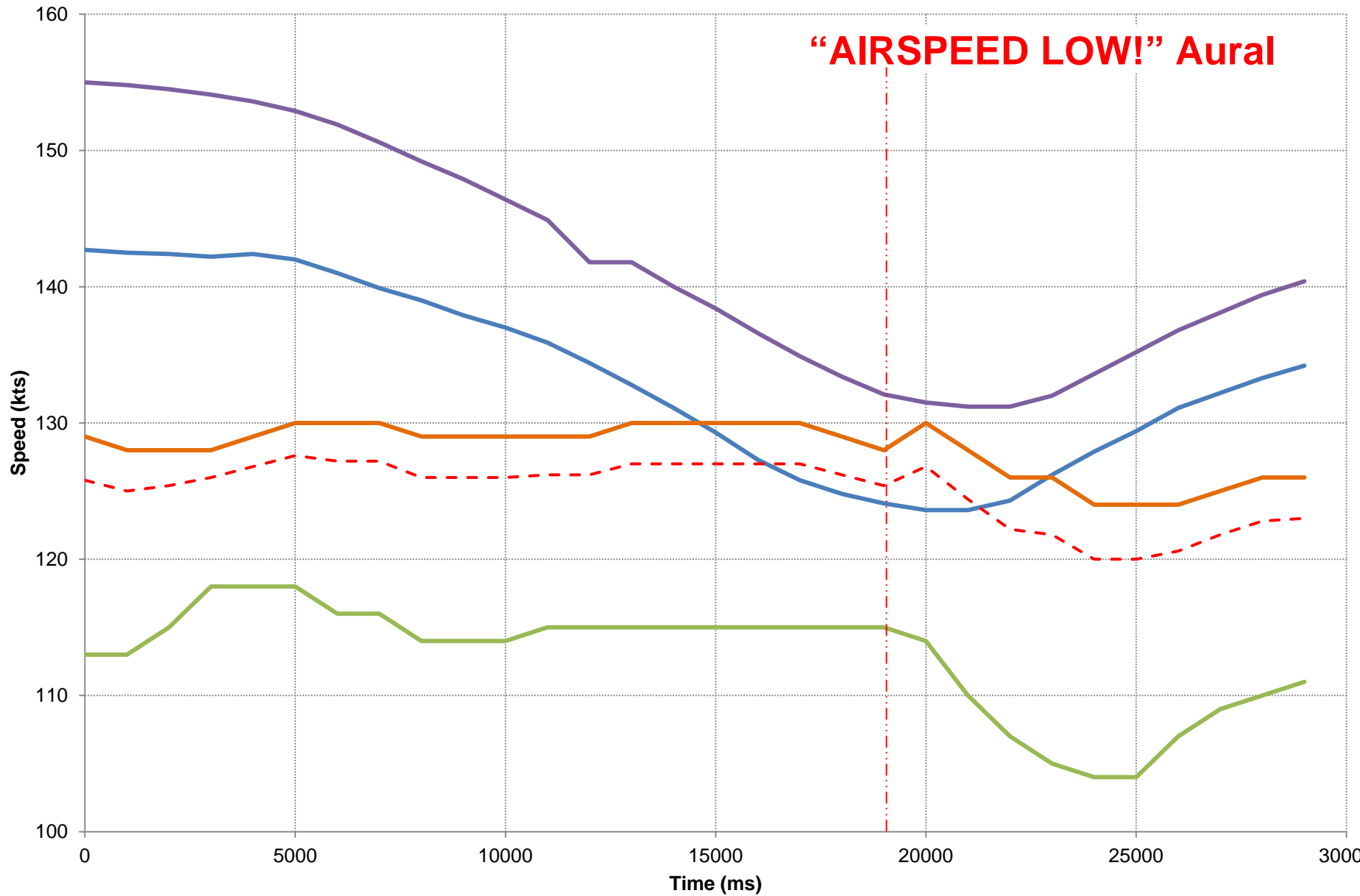
Loss of Control Stall Accident

B-737NG Amsterdam 2009



Added an E-GPWS aural—"Air Speed Low!"
set for an airspeed into 2/3 of Flashing Amber Band



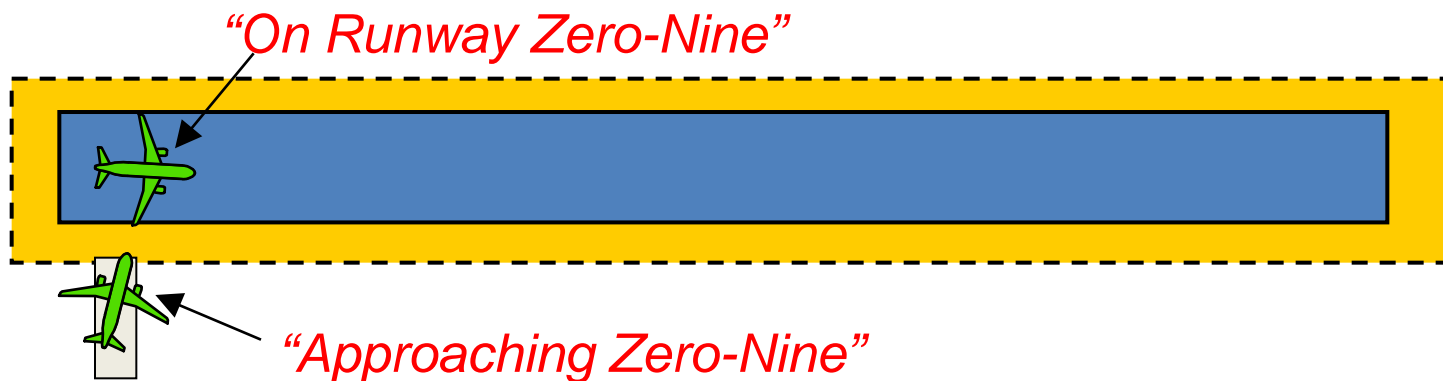


— CAS — Minimum Operating Speed — Stick Shaker Speed — Ground Speed - - - AS_LOW

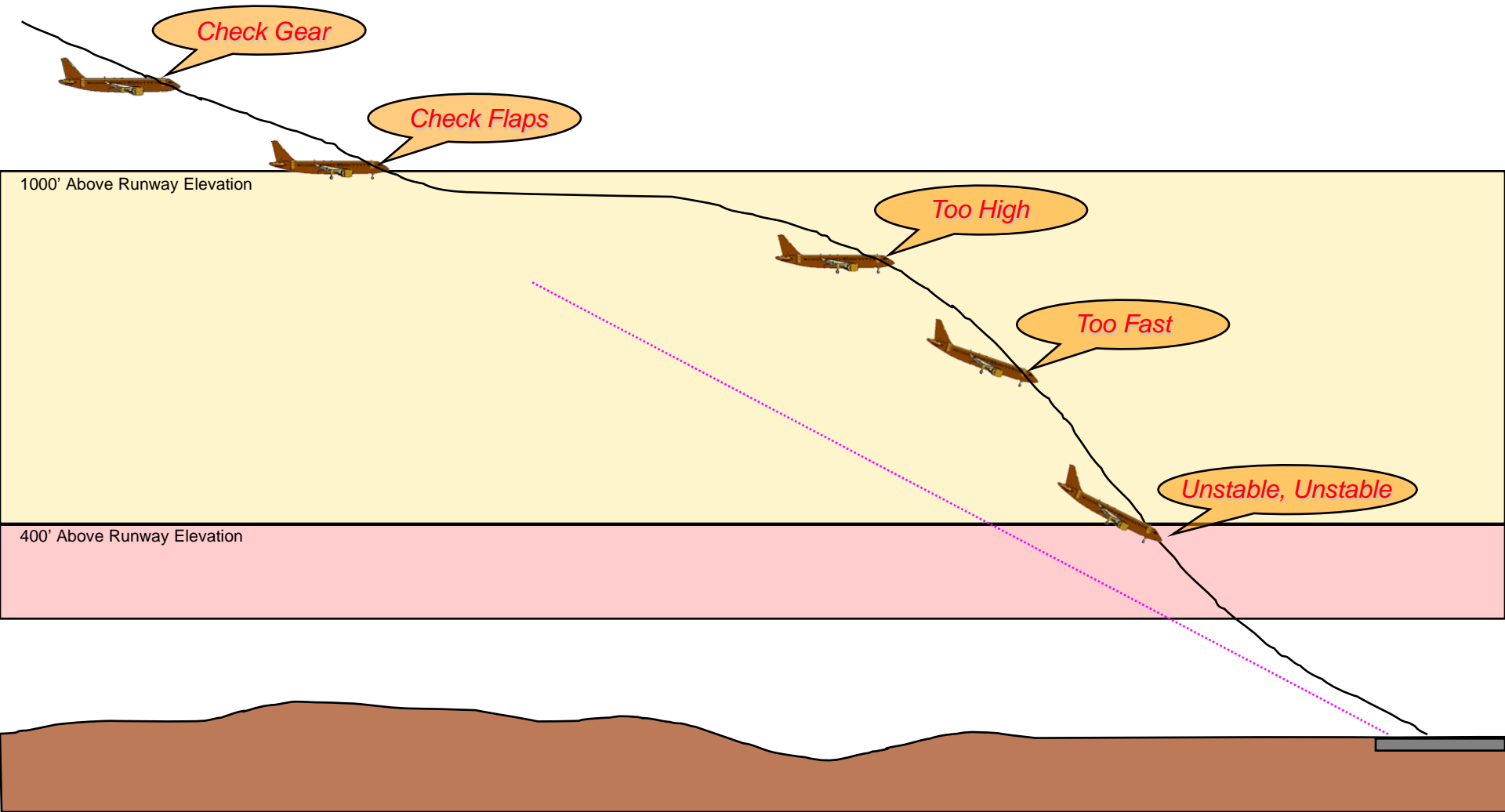
Honeywell

A Simple and Practical Solution for runways—RAAS

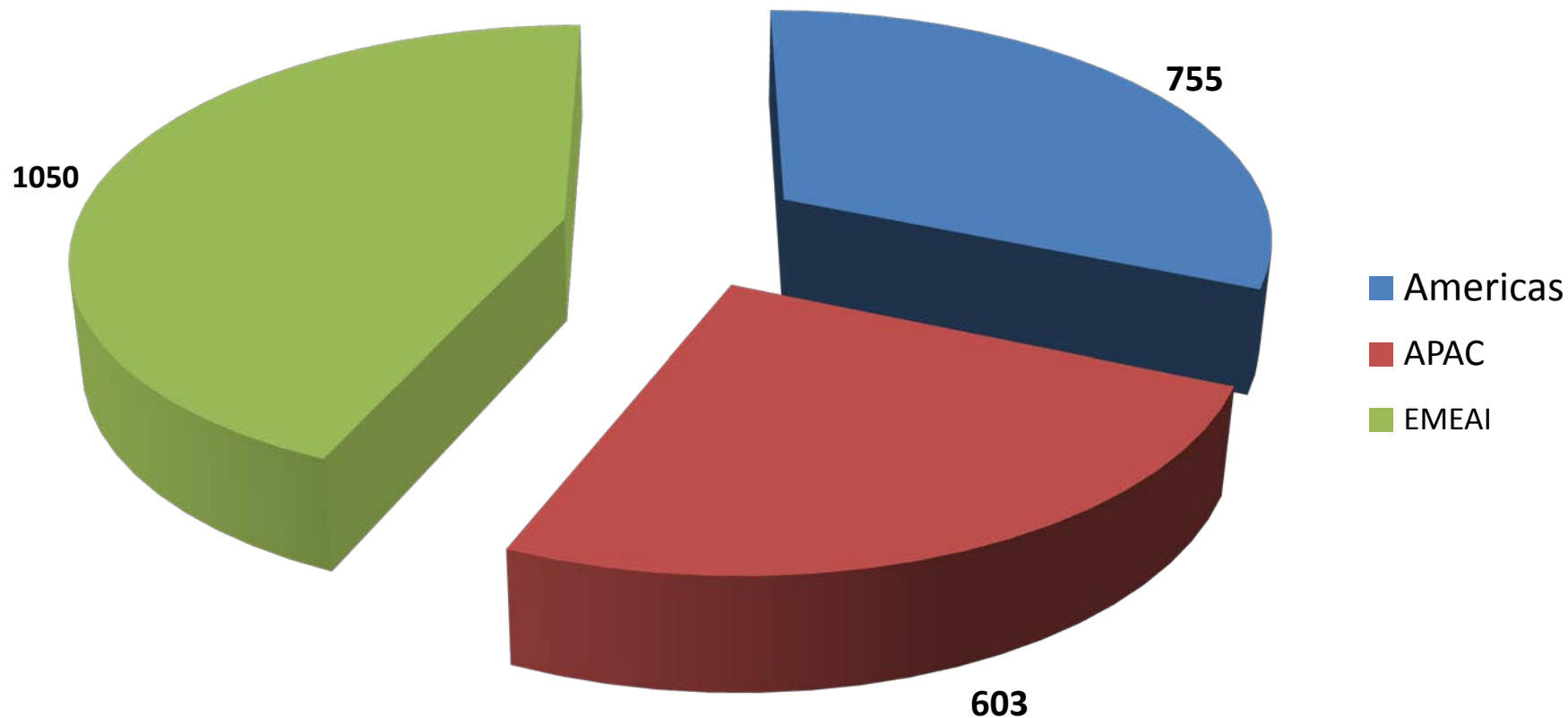
- Utilizes the existing E-GPWS platform installed on more than 30,000 aircraft worldwide with the E-GPWS worldwide runway database.
- Optional RAAS software provides:
 - Aural voice advisories when entering a runway or on a runway.
 - Optional advisory for identifying the runway on final approach.
 - Optional short runway callout on take-off or landing approach.
 - Distance remaining callouts on landing, RTO, or at end of runway.
 - Taxiway take-off advisory.
 - Extended “holding” reminder callout.
- Utilizes a “virtual” box around the runway and uses Voice Advisories---



SAM – Stabilized Approach Monitor



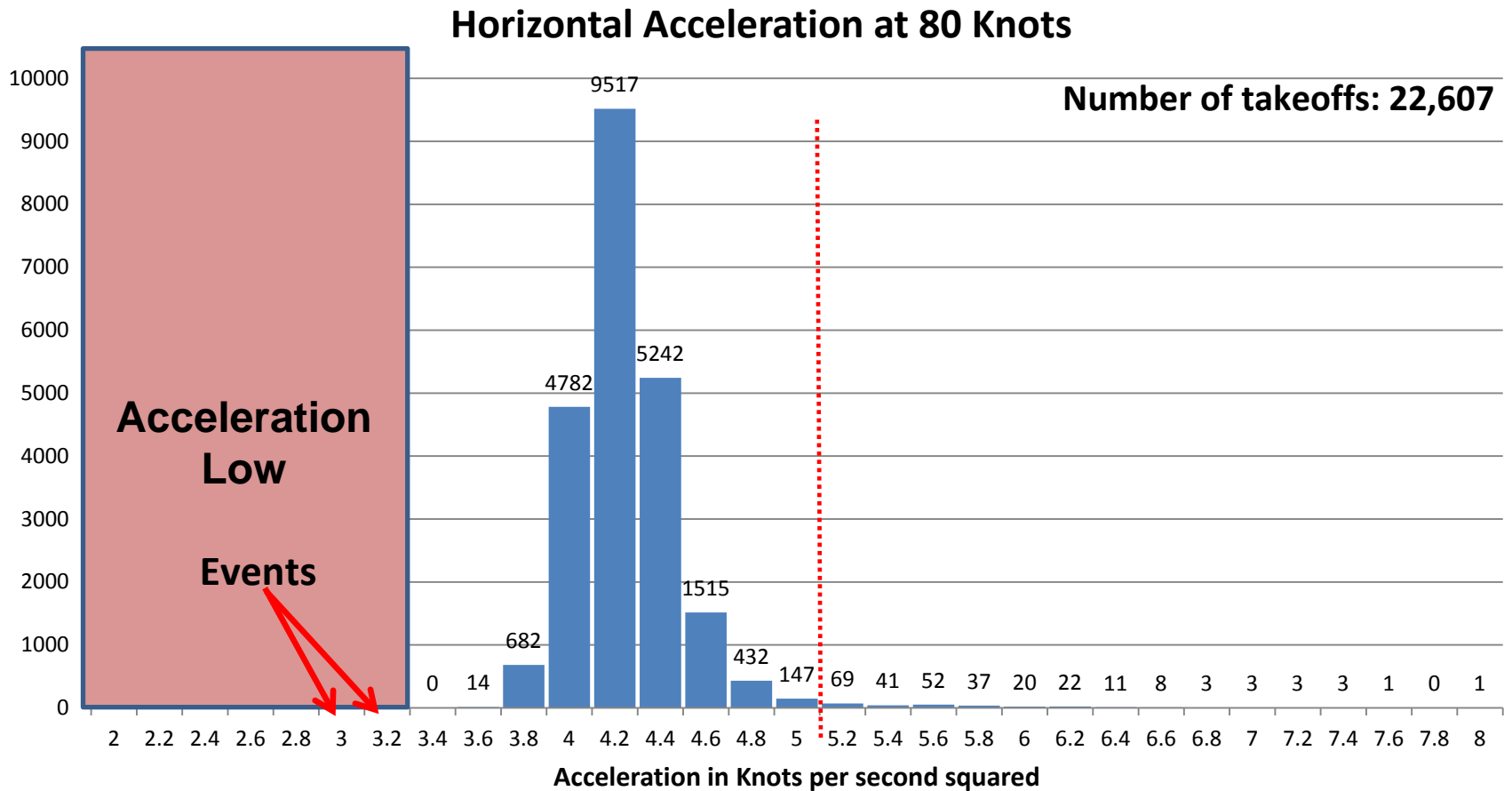
Aircraft fitted with Honeywell Runway Safety Functions RAAS / 'Smart Runway' / 'Smart Landing'



Reducing Take-Off Risks

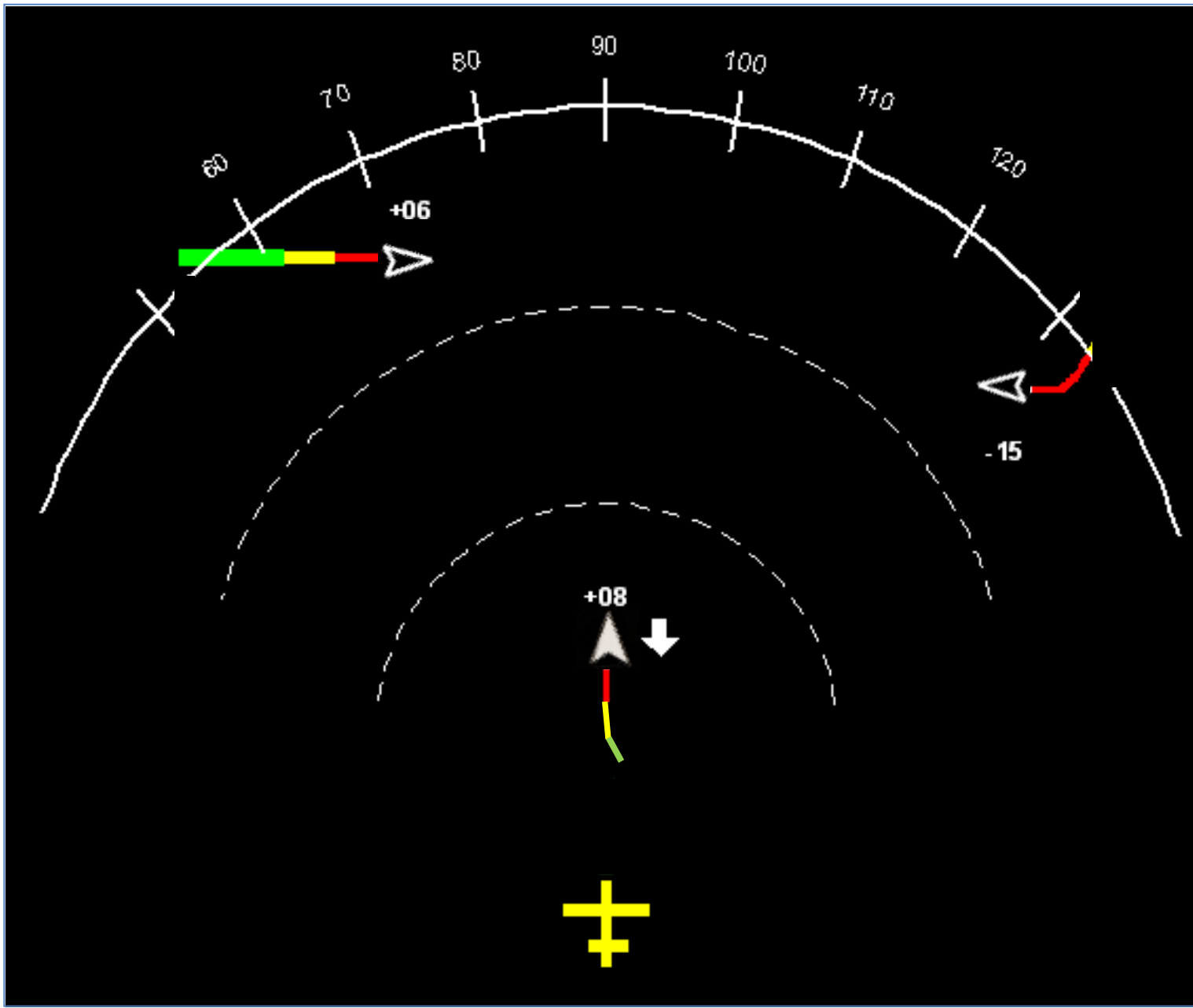
- Working with Airlines on a Take-Off sub-standard Acceleration
 - Alert set at 80 KTS
 - Aural and Simple display
 - Display of Runway and V rotate

Takeoff Acceleration



Enhancing Pilot Awareness to Wake Turbulence

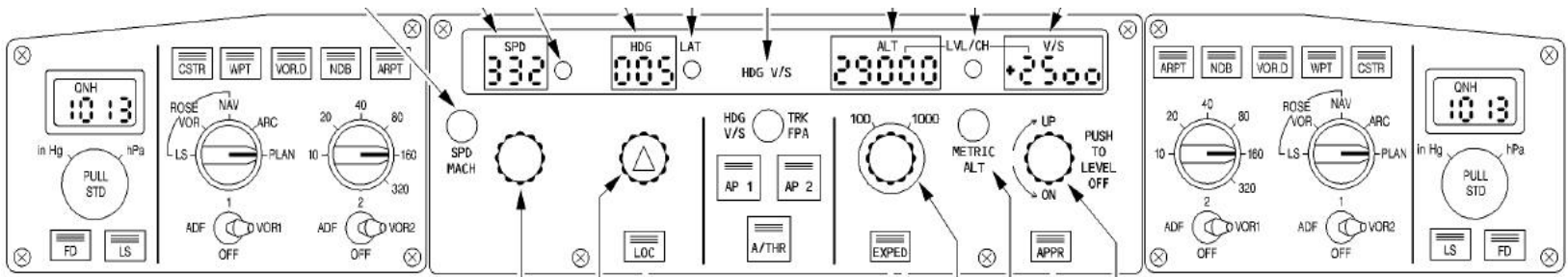




Poor Human Factor Design Example: B-737 versus A-320 Autopilot Control



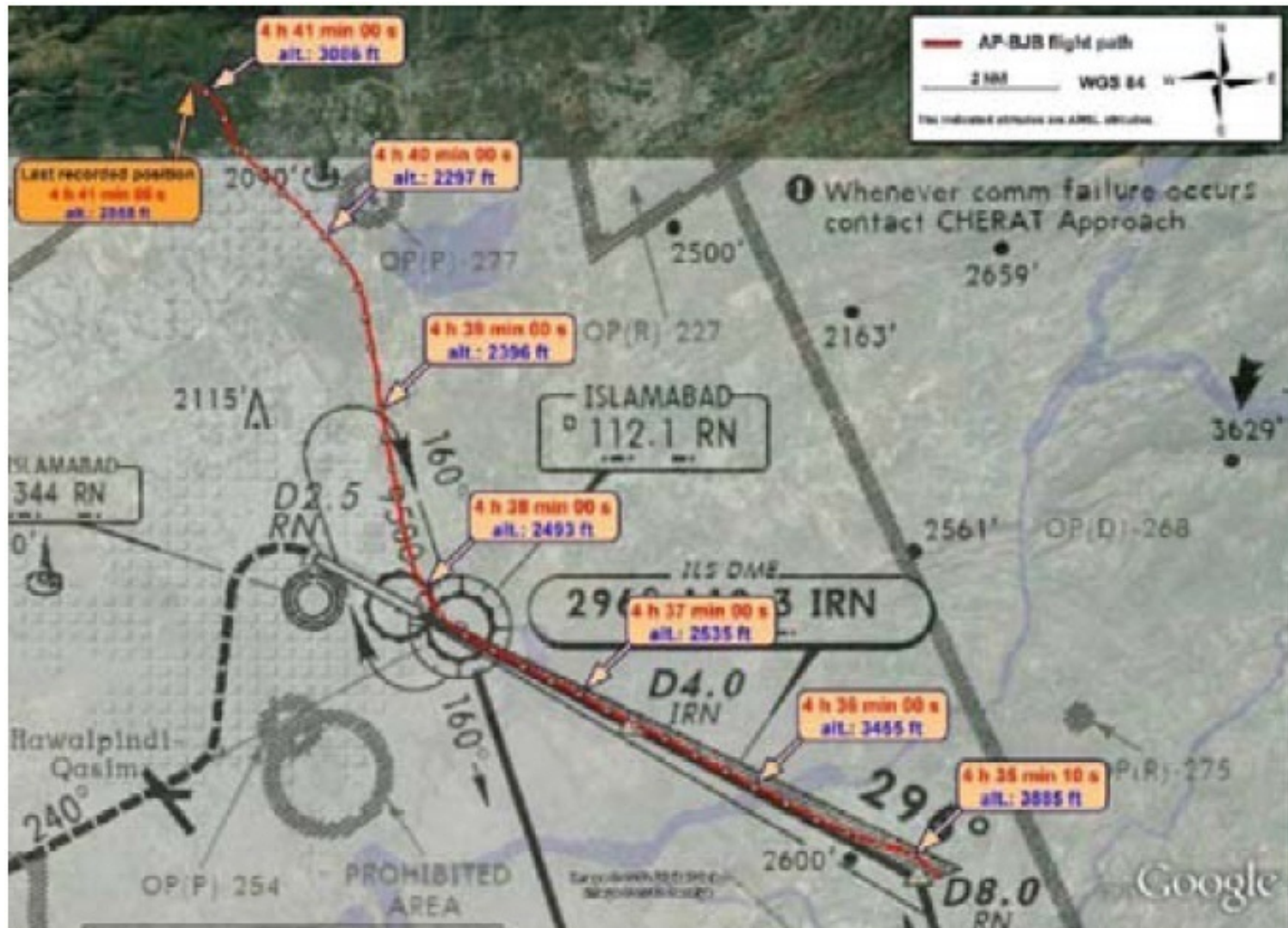
Boeing—Press Knobs



Airbus---Pull Knobs to engage

Islamabad July 28, 2010-- 152 fatalities

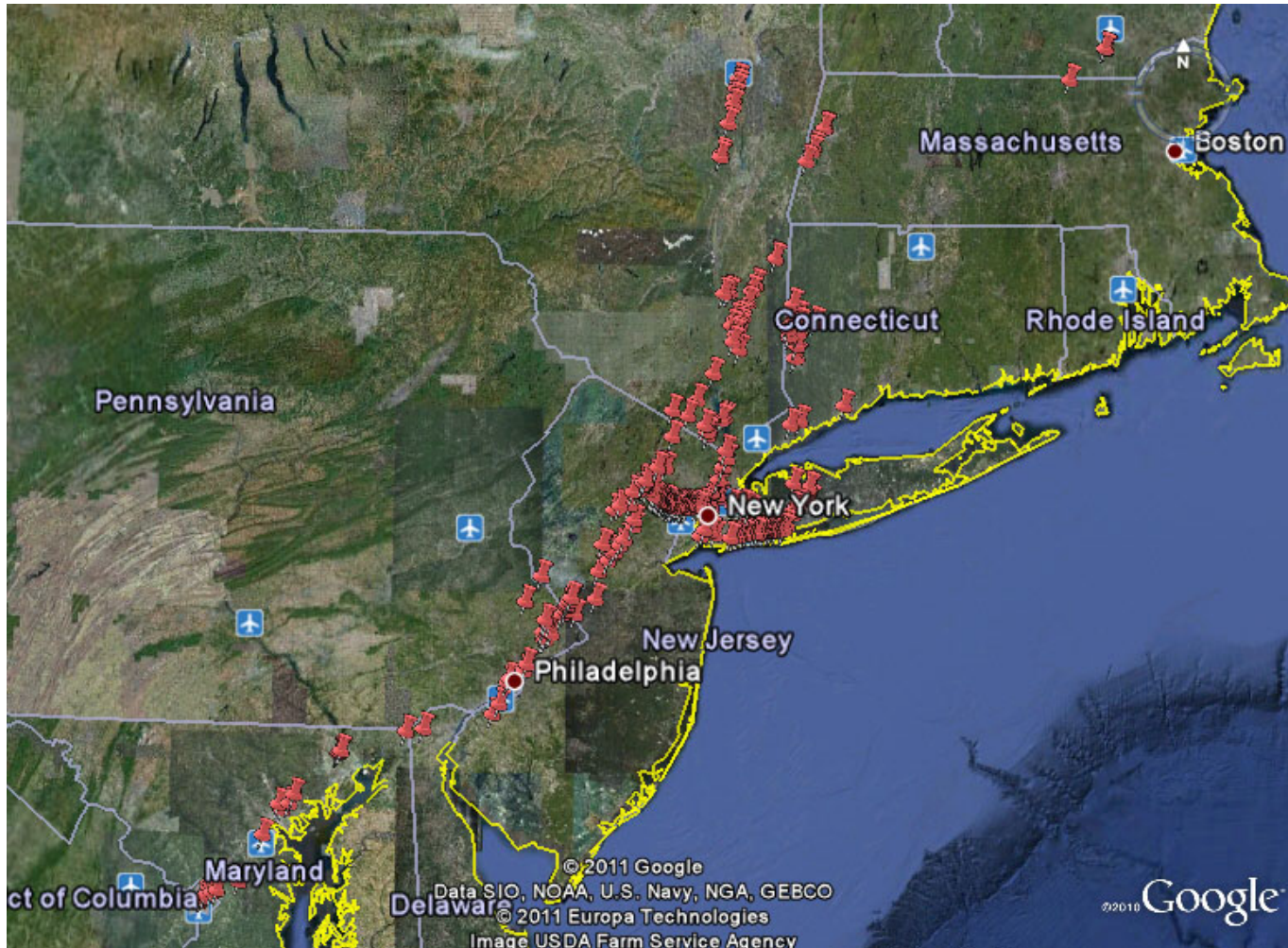
In spite of 70+ seconds E-GPWS Warning



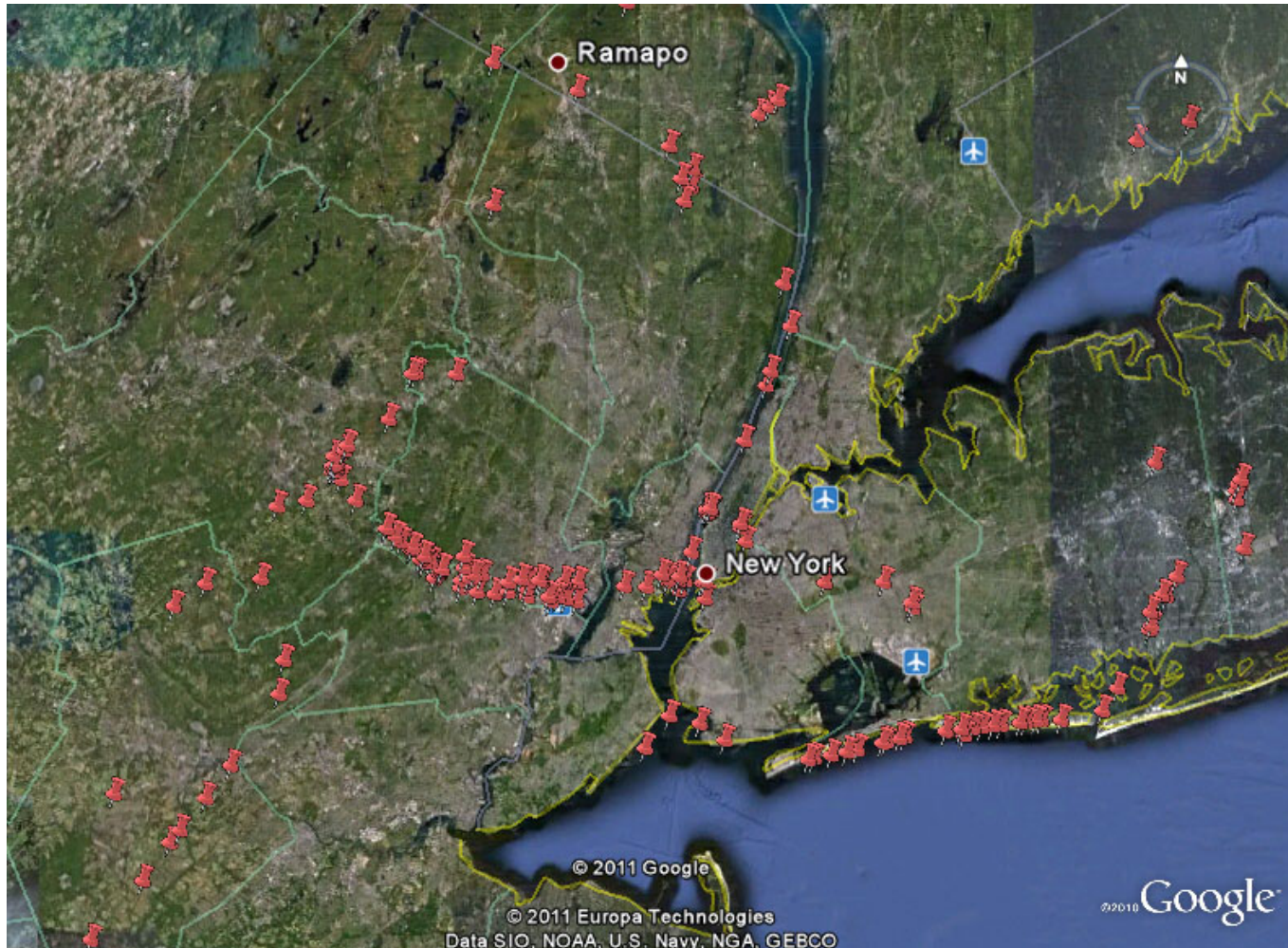
Examples of GPS Interference

- ‘Trucker-Berry Jam’—crack down by FBI in US
- ‘Light squared’---Aviation Industry pushback
- High Power VHF Transmitter Harmonics

GPS Dropouts AW-139 Helicopter with EMK 22 HTAWS



GPS Dropouts near Newark AW-139





New Technology can also inadvertently add risk----such as Increased Mid-Air collision using GPS on existing Airways-



Flying on an old airway and using GPS Navigation

SLOP

- On June 10th 2004 Strategic Lateral Offset Procedure (SLOP) was implemented in the North Atlantic Region. On the 20th of January 2005 SLOP was implemented in the Gulf of Mexico Oceanic airspace and in the Oakland and Anchorage oceanic airspace of the Pacific.

The intent of the procedure is to distribute the traffic following a routing across a 2 mile wide area to the right of the course centerline. Specific procedures include:

- To participate in SLOP the aircraft avionics must be capable of performing automatic offset functions
- It is not necessary to request offset from Air Traffic Control • It is not necessary to inform Air Traffic Control that an offset is being flown
- The aircraft must cross into the oceanic Flight Information Region (FIR) on course (over the oceanic entry point)
- Once established in the oceanic FIR the pilot has the option of flying the course centerline, one mile right or two miles right of centerline. • All offsets must be to the right of centerline
- All position reports are given as if crossing directly over the waypoints included in the crossing clearance
- The aircraft must cross out of the oceanic FIR on course (over the oceanic exit point)
- Aircraft that may transit areas of radar coverage within the oceanic FIR are to maintain their offset

A New Meaning to the word
“CONTACT!”



CHICKEN WINGS®

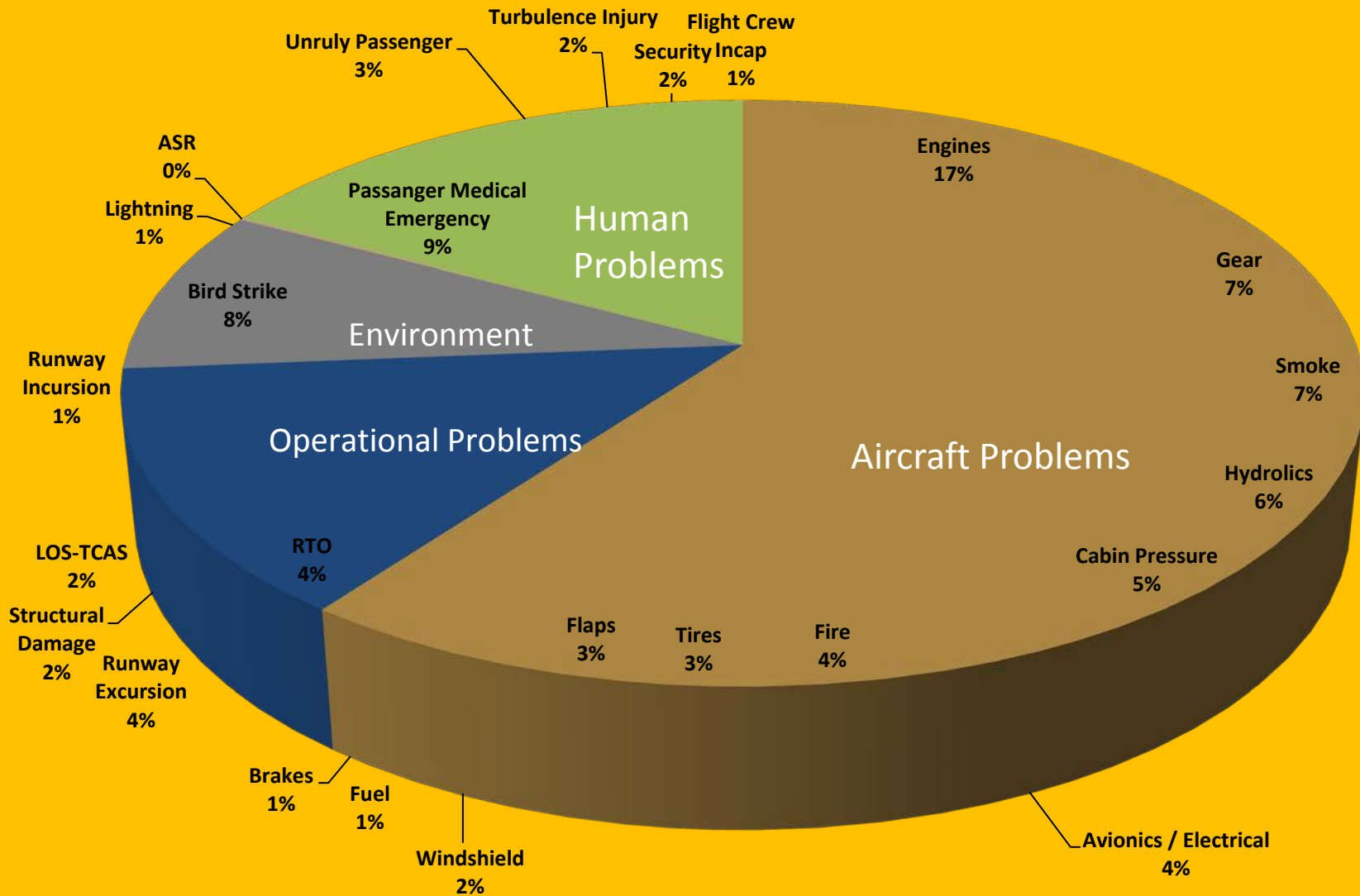
BY MICHAEL AND STEFAN STRASSER

www.chickenwingscomics.com

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1140 Flight Incidents from June to November 2010



Every day, Pilots deal with real problems, requiring Decisions----



Improving Flight Safety

- We humans tend to re-act only after disasters.
- It takes fatal accidents that are well publicized by the media to bring public pressure for improvements. We need to encourage the industry to invest in necessary, practical, low cost safety and training technology.
- We need to continue to address human factors issues between pilots and machines.
- We need to prepare for new future pilots---where will they come?

A future Aviator?



Or perhaps a future engineering Nerd?



Future Captain CRM Mentoring?



- Thank you for listening to my thoughts on current and future aviation safety issues.

My thoughts are solely mine and do not necessarily reflect official Honeywell thinking.