



**Seventeenth Pan America — Regional Aviation Safety Team Meeting (PA-RAST/17)**  
Lima, Peru, 11 to 12 June 2014

**Agenda Item 7: Update on Runway Excursion Issues**

**RUNWAY EXCURSION SAFETY TEAM REPORT**

(Presented by the Secretariat)

<b>EXECUTIVE SUMMARY</b>	
This working paper presents the analysis results of the Safety Enhancement Team (SET) on Runway Excursions.	
<b>Action:</b>	The meeting is invited to comment on the information provided in this WP
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"> <li>• Safety</li> <li>• Air Navigation Capacity and Efficiency</li> <li>• Economic Development of Air Transport</li> <li>• Environmental Protection</li> </ul>
<i>References:</i>	<ul style="list-style-type: none"> <li>• Fourteenth Pan America — Regional Aviation Safety Team Meeting (PA-RAST/14)</li> <li>•</li> </ul>

**1. Background**

1.1 During the Fourteenth Pan America — Regional Aviation Safety Team Meeting (PA-RAST/14) that took place in Lima, Peru, from 18 to 19 September 2013, different working groups denominated SET were conformed to analyse in depth flight safety information and studies available on the principal risk areas identified by RASG-PA:

- RE Runway Excursions
- LOC-I Loss of Control Inflight
- CFIT Controlled Flight Impact into Terrain
- MAC Mid-Air Collision

1.2 The ICAO South American Office offered to lead the Runway Excursion Safety Enhancement Team (RE SET). In this regard States and Industry were requested to participate, and three working groups were conformed. (Appendix A refers).

1.3 The work was developed through GoTo Meeting facility, no face-to-face meeting was held. The specialist on flight safety information analysis, Mr. Winston San Martín from DGAC Chile, assessed the last accidents related to runway excursions, causes and conclusions. In the same way, the United States Civil Aviation Safety Team (CAST), presented conclusions on this subject. (Appendix B contains both presentations).

1.4 With this information, each of the working groups developed its work with a rapporteur and the support of one member of the Secretariat to present recommendations on possible mitigation actions and analyse their impact and implementation possibilities.

## **2. Analysis**

2.1 The results of the three groups are presented in Appendix C. A summary of the results classified by the three types of mitigation actions, requirement/procedures, training and technology, is being presented below.

### **Requirements/Procedures:**

2.2 The following aspects were considered:

- Adherence to SOP, including the incorporation of standards requirements in the Operations Manual of each operator on stabilized approaches policies and braking procedures.
- Development of uniform criteria on unstabilized approach
- RSTs implementation
- Runway maintenance

### **Training:**

2.3 Training to pilots and controllers on all RE contributing factors.

### **Technology:**

2.4 The following aspects were considered:

- PBN implementation priority in airports presenting RE high risk
- On-board technology implementation to avoid RE

## **3. Conclusions**

3.1 The worked developed by the RE SET provides important guidelines on risk mitigation actions for runway excursions. The assessment on runway excursion problem should continue, bettering flight safety intelligence information quality in order to determine with certainty the contributing factors, and in this way to have the precision needed for decision making.

**APPENDIX A**  
**CONFORMATION OF GROUPS — SET Runway Excursion (RE)**

**Group 1**

1. Fredy Nuñez (ATM and SSP DGAC-Peru) Leader
2. Lia Ricalde (AGA, ICAO SAM)
3. Miguel Camacho (Pilot, SSP, AIG, UAEAC - Colombia)
4. Francisco Silva (Embraer)
5. Javier Puente (OPS, AIG, SRVSOP)
6. Fernando Correia (ANAC - Brasil)

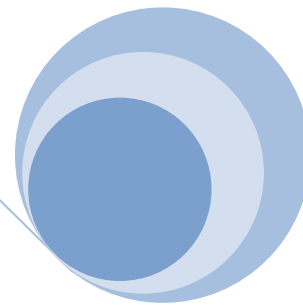
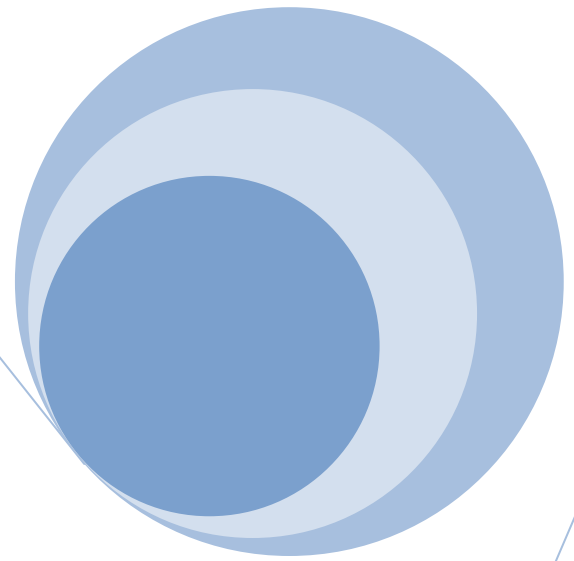
**Group 2**

1. Roque Hauser (AIR, AIG, ANAC - Argentina) Leader
2. Gerardo Hueto (Safety Specialist, AIR, Boeing)
3. Verónica Chávez (AIR, ICAO SAM)
4. Winston San Martin (Pilot, AIG, DGAC - Chile)
5. Fabio Catani (Embraer)

**Group 3**

1. Gabriel Acosta (AIR, Safety Specialist IATA) Leader
2. Marcelo Ureña (OPS ICAO SAM)
3. Antonio (SSP, ANAC Argentina)
4. Robert Noges (Safety Specialist, Boeing, CAST)
5. Marcelo Veras (Embraer)

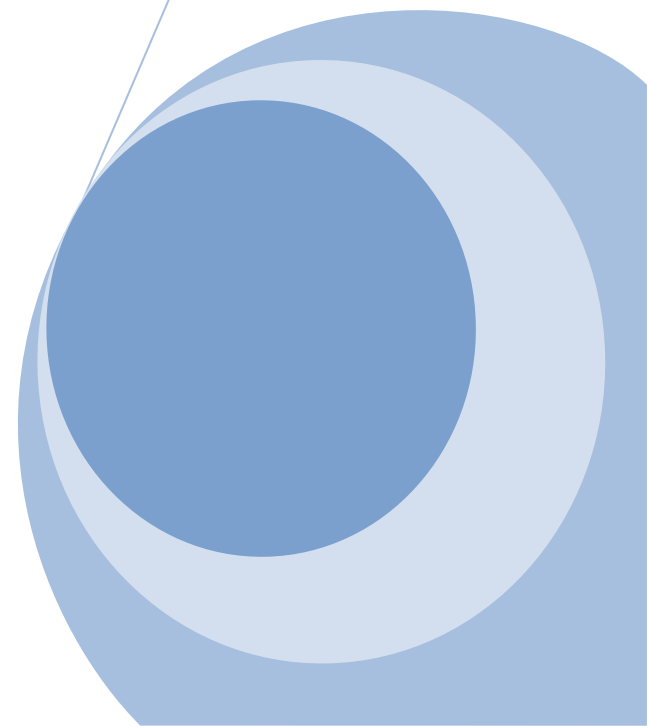
-----



# **Estudio de Seguridad Operacional. Salidas de pista en la Región Panamericana**

Accidentes ocurridos en Estados de la Región Panamericana, entre el 01 de enero de 2002 y el 29 de octubre de 2013.

**Winston E. San Martín**  
**02/12/2013**



## Contenido

Índice de Tablas .....	2
Índice de gráficos .....	2
Fases de vuelo .....	6
Condiciones meteorológicas .....	6
Aeródromos recurrentes.....	7
Categorías asociadas a Salidas de Pista .....	9
Relaciones entre categorías .....	10
Apéndice. Resumen de casos. ....	12

## Índice de Tablas

Tabla 1. Estados de la Región Panamericana agrupados .....	3
Tabla 2. Accidentes categoría Salida de Pista por Región y año.....	4
Tabla 3. Salidas de Pista por Año, Región y Estado.....	5
Tabla 4. Distribución de Salidas de Pista según fase de vuelo .....	6
Tabla 5. Relevancia de aspectos meteorológicos en Salidas de Pista.....	7
Tabla 6. Distribución de Salidas de Pista por Aeródromos .....	7
Tabla 7. Categorías asociadas a Salida de Pista .....	9
Tabla 8. Categorías asociadas y fases de vuelo .....	10

## Índice de gráficos

Gráfico 1. Distribución porcentual de Salidas de Pista por Región.....	4
--	---

# Antecedentes

El presente estudio tiene por objeto representar la distribución de los accidentes de aviación clasificados como Salidas de Pista, ocurridos en la Región Sudamericana, en el período comprendido entre el 01 de enero de 2002 y el 29 de octubre de 2013.

Para efectos de análisis, se consideraron exclusivamente sucesos clasificados como accidentes de aviación (de acuerdo con la definición del Anexo 13 al Convenio sobre Aviación Civil Internacional “Investigación de Accidentes de Aviación”), registrados en el Sistema ADREP/ECCAIRS de OACI, involucrando aeronaves con cualquier peso máximo de despegue, y en todo tipo de operación, en que se identificó la categoría “Salida de Pista”, ocurridos en las Regiones que se detallan en la tabla siguiente:

**Tabla 1. Estados de la Región Panamericana agrupados**

Región CAR		Región NAM	Región SAM
Anguilla	Haití	Bermuda	Argentina
Antigua y Barbuda	Honduras	Canadá	Bolivia
Aruba	Jamaica	San Pierre Miquelon	Brasil
Bahamas	Martinica	Estados Unidos de Norteamérica	Chile
Barbados	México		Colombia
Belice	Montserrat		Ecuador
Islas Vírgenes Británicas	Nicaragua		Guyana
Islas Caimán	Puerto Rico		Guayana Francesa
Costa Rica	República Dominicana		Panamá
Curaçao	San Kitts y Nevis		Paraguay
Dominica	Santa Lucía		Perú
El Salvador	San Vicente y Las Granadinas		Surinam
Granada	Trinidad y Tobago		Uruguay
Guadalupe	Islas Turcas y Caicos		Venezuela
Guatemala	Islas Vírgenes		

Los datos para el análisis fueron provistos por la Sede Central de OACI.

Además de lo anterior, el estudio incluye la cantidad de despegues de aeronaves, en operaciones de Transporte Aéreo Comercial Regular. Para estos efectos, se consultó la data existente en el sistema iSTARS-SPACE de OACI.

# Datos generales

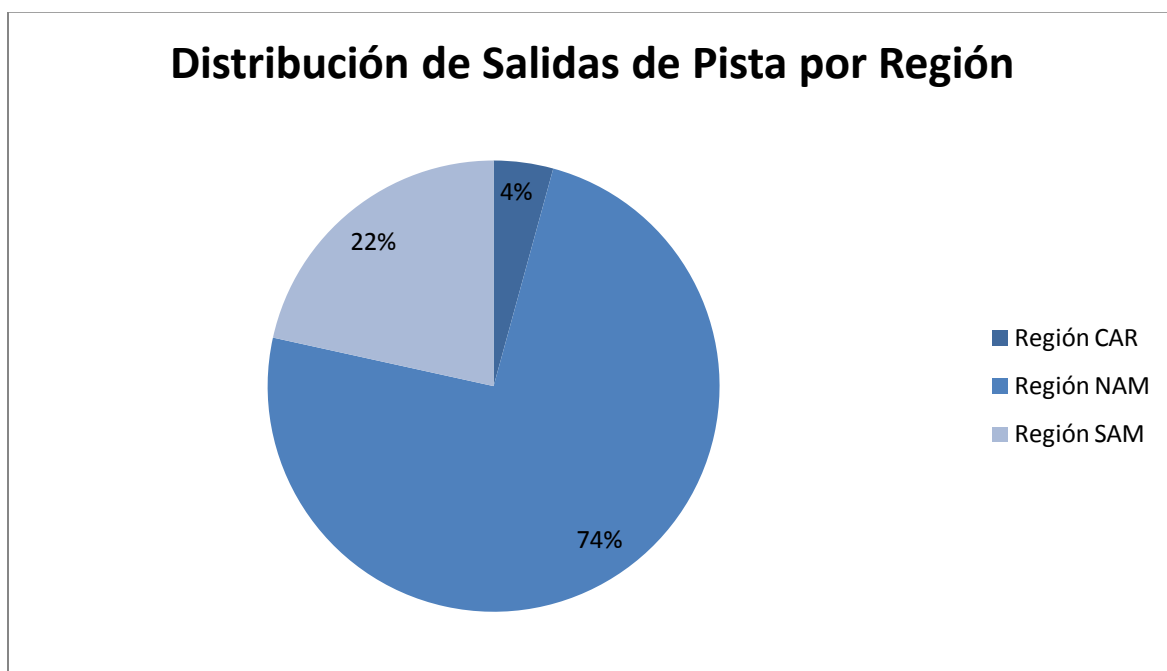
Durante el período de interés, se registró un total de 399 accidentes clasificados como Salidas de Pista, en la Región Panamericana. La tabla siguiente, muestra la distribución de los accidentes por Región y año.

Tabla 2. Accidentes categoría Salida de Pista por Región y año

Región	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total general
Región CAR		1	1		2	4	2	2	1	2	1	1	17
Región NAM	27	23	36	34	22	31	46	28	34	15			296
Región SAM	5	8	1	4	3	11	13	20	7	9	4	1	86
Total general	32	32	38	38	27	46	61	50	42	26	5	2	399

El gráfico siguiente presenta la distribución porcentual de los accidentes en cuestión, por Región.

Gráfico 1. Distribución porcentual de Salidas de Pista por Región



La tabla siguiente muestra la distribución de accidentes por Salidas de Pista por año y según los Estados de las Regiones CAR, NAM y SAM.

Tabla 3. Salidas de Pista por Año, Región y Estado

Estados por Región	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total general
<b>Región CAR</b>													
Bahamas					1	1				1	1	1	5
Belice						1							1
Costa Rica						1	1						2
Cuba		1											1
Dominica						1							1
Haití					1					1			2
Honduras							1						1
Jamaica								1					1
México								1	1				2
Puerto Rico			1										1
<b>Región NAM</b>													
Canadá	2	2	6	2	3	2	2	9	3	5			36
EEUU	25	21	30	32	19	29	44	19	31	10			260
<b>Región SAM</b>													
Argentina				1	2		1	1	1				6
Bolivia		1						2				1	4
Brasil	3	6		1		2	6	7	2	6	1		34
Chile				1		1				1			3
Colombia	2		1		1	2	4	6	2				18
Ecuador		1		1		1	1		2	1			7
Guyana										1			1
Panamá								1					1
Surinam								1					1
Venezuela						5	1	2			3		11
<b>Total general</b>	<b>32</b>	<b>32</b>	<b>38</b>	<b>38</b>	<b>27</b>	<b>46</b>	<b>61</b>	<b>50</b>	<b>42</b>	<b>26</b>	<b>5</b>	<b>2</b>	<b>399</b>



# Áreas de Interés

---

## Fases de vuelo

Al efectuar un análisis de las fases de vuelo en que se originaron los accidentes clasificados como Salidas de Pista, se observó que un 70% de los casos ocurrió durante el aterrizaje, mientras que un 22% fue registrado durante el despegue.

Por otra parte, en un caso (0,25%) la Salida de Pista se registró durante el rodaje, y los casos restantes fueron clasificados como ocurridos en fases de vuelo no especificadas, o se indicó aproximación o en ruta. Estas últimas situaciones podrían tener su origen al considerar que las Salidas de Pista podrían haberse ocasionado como consecuencia de otros eventos, ocurridos mientras las aeronaves se encontraban en vuelo. La tabla siguiente muestra el detalle de la información referida.

Tabla 4. Distribución de Salidas de Pista según fase de vuelo

Fase de vuelo	Salidas de Pista
No indicada	12
Despegue	89
En ruta	6
Aproximación	11
Aterrizaje	280
Rodaje	1
<b>Total general</b>	<b>399</b>

## Condiciones meteorológicas

Si bien, en más de la mitad de los casos no se incorporaron antecedentes acerca de la relevancia de las condiciones meteorológicas al momento de ocurrir los accidentes objeto del estudio, se constató que en un 14% del total de casos, sí se determinó que la meteorología fue un factor de importancia. En estos casos, no existieron diferencias de frecuencia significativas entre condiciones IMC o VMC, como se detalla en la tabla siguiente:

Tabla 5. Relevancia de aspectos meteorológicos en Salidas de Pista

Relevancia de la meteorología	VMC	Condiciones no indicadas	IMC	Condiciones desconocidas	Total general
No indicada	120	76	30	3	229
No relevante	92	6	8	2	108
Relevante	29	2	24		55
Se ignora	3	2	1	1	7
<b>Total general</b>	<b>244</b>	<b>86</b>	<b>63</b>	<b>6</b>	<b>399</b>

## Aeródromos recurrentes

Al analizar la recurrencia de Aeropuertos y Aeródromos de la Región Panamericana, se observó que 332 de los 399 registros, mantenían en blanco el campo relativo al aeródromo, mientras que de los restantes, los más recurrentes fueron Congonhas (Sao Paulo) y Mariscal Sucre (Quito). Las frecuencias específicas se muestran a continuación.

Tabla 6. Distribución de Salidas de Pista por Aeródromos

Aeródromos según código OACI	Cantidad de Accidentes
No especificados	332
SBSP (CGH): Sao Paulo/Congonhas, Sp	4
SEQU (UIO): Quito/Mariscal Sucre	3
SELJ : La julia	2
CYFB (YFB): Iqaluit, N.W.T.	2
SKCA : Capurgana/Choco	2
SKBO (BOG): Bogota/Eldorado	2
SBCF (CNF): Belo Horizonte/Tancredo Neves,Mg	1
MYAM (MHH): Marsh Harbour, Abaco I.	1
CYOW (YOW): Ottawa/Intl, Ont.	1
CYRC : Chicoutimi/St-Honore, Que.	1
PAOT (OTZ): Kotzebue/Ralph Wien Memorial Ak.	1
CYTR (YTR): Trenton Cfb, Ont.	1
SCGO : Angol/Los Confines	1
CYTZ (YTZ): Toronto I., Ont.	1
TDPR : Roseau	1
CYVP (YVP): Kuujuaq, Que.	1
MYEF (GGT): George Town/Exuma Intl, Exuma I.	1
CYVQ (YVQ): Norman Wells, N.W.T.	1
SADF : San Fernando,Ba	1
CYVR (YVR): Vancouver/Intl, B.C.	1

CYMT (YMT): Chibougamou/Chapais, Que.	1
CYYZ (YYZ): Toronto/Lester B. Pearson Intl,Ont.	1
SECO (OCC): Coca	1
CZBB (YDT): Boundary Bay, B.C.	1
SVMI (CCS): Caracas/Simon Bolivar Internacional Maiquetia D.F. Municipio Vargas	1
KDEN (DEN): Denver/Stapleton Intl, Co.	1
CYAQ (XKS): Kasabonika, Ont.	1
KDLF (DLF): Del Rio/Laughlin Afb, Tx.	1
MYBS : Alice Town/South Bimini, Bimini I.	1
KEYW (EYW): Key West/Key West Intl, Fl.	1
Other	1
KLCH (LCH): Lake Charles/Regional,La.	1
SAAA : San Antonio De Areco,Ba	1
KMDW (MDW): Chicago/Chicago Midway,Il.	1
SAEZ (EZE): Buenos Aires,Ministro Pistarini (Ezeiza),Ba	1
KPDK (PDK): Atlanta/De Kalb-Peachtree, Ga.	1
SBHT (ATM): Altamira, Pa	1
KPDX (PDX): Portland/Intl, Or.	1
SCBA (BBA): Balmaceda/Balmaceda	1
CYHH (YNS): Nemiscau, Que.	1
SCRD : Vina Del Mar/Rodelillo	1
CYHM (YHM): Hamilton, Ont.	1
CYOO (YOO): Oshawa, Ont.	1
SKMU (MVP): Mitu/Mitu	1
SLTR (TDD): Trinidad	1
KPVD (PVD): Providence/Theodore Francis Greene State,Ri.	1
SKMD (EOH): Medellin/Olaya Herrera	1
KTVC (TVC): Treverse City/Cherry Capital Mi.	1
SKVV (VVC): Villavicencio/Vanguardia	1
MKJP (KIN): Kingston/Norman Manley Intl	1
SVCN (CAJ): Canaima, Bolivar	1
MMAN (NTR): Monterrey Int/Aeropuerto Del Norte	1
SYTM : Georgetown/Timehri Intl	1
MMCV (CVM): Ciudad victoria	1
CYEG (YEG): Edmonton/Intl, Alta.	1
Unknown	1
MROC (SJO): Alajuela (San Jose)/Juan Santamaria Intl	1
MRPV : San Jose/Tobias Bolanos Intl	1
<b>Total general</b>	<b>399</b>

## Categorías asociadas a Salidas de Pista

Se observó que en muchos de los accidentes clasificados como Salida de Pista, también se identificaron otras categorías, que pudieron actuar como catalizadores o condicionantes de los sucesos en estudio, especialmente Pérdida de Control en Superficie (LOC-G), Falla de Sistema/Componente – No Motor (SCF-NP) y Contacto Anormal con la Pista (ARC). La tabla siguiente muestra la cantidad de oportunidades en que otras categorías fueron identificadas junto con Salida de Pista.

Tabla 7. Categorías asociadas a Salida de Pista

Categoría	Reportes	% de Salidas de pista
LOC-G: Pérdida de control en superficie	109	27%
SCF-NP: Falla de sistema-no motor	79	20%
ARC: Contacto anormal con la pista	59	15%
SCF-PP: Falla de motor	21	5%
UNK: Desconocido/indeterminado	18	5%
ADRM: Relativo al aeródromo	17	4%
F-POST: Fuego/humo post impacto	17	4%
LOC-I: Pérdida de control en vuelo	12	3%
USOS: Aterrizaje corto/rebasando el final de pista	7	2%
OTHR: Otras	5	1%
WSTRW: Cizalladura/tormenta	5	1%
EVAC: Evacuación	4	1%
FUEL: Relativo a combustible	3	1%
BIRD: Impacto con aves	2	1%
F-NI: Fuego/humo sin impacto	2	1%
ICE: Englamiento	2	1%
RI-A: Incursión de animal en pista	2	1%
AMAN: Maniobra brusca	1	0%
CFIT: Vuelo controlado hacia el terreno	1	0%
RAMP: Servicios de escala	1	0%

Los aspectos de interés relacionados con la tabla anterior se pueden resumir señalando que aproximadamente en una de cada cuatro Salidas de Pista, se detectó la participación de pérdida de control en superficie, en una de cada cinco, se observó falla de algún sistema o componente de la aeronave, y en una de cada siete, contacto anormal con la pista.

Por otra parte, al contrastar estos hallazgos con las fases de vuelo en que ocurrieron los accidentes, se observó la predominancia de los sucesos ocurridos durante el aterrizaje, contando para el 70% de las pérdidas de control en superficie, el 72% de las fallas de sistema o componente, y el 90% de los contactos anormales con la pista.

Tabla 8. Categorías asociadas y fases de vuelo

Categorías	No indicada	Despegue	En ruta	Aproximación	Aterrizaje	Total general
ARC	2	2	1	1	53	59
LOC-G	2	28	1	2	76	109
SCF-NP		18	2	2	57	79
<b>Total general</b>	<b>4</b>	<b>48</b>	<b>4</b>	<b>5</b>	<b>186</b>	<b>247</b>

## Relaciones entre categorías

En general, los sucesos relacionados con pérdida de control en superficie, ocurrieron principalmente durante la fase de carrera de aterrizaje, y tuvieron su origen en aspectos operacionales, relativos a que no mantener el control direccional de las aeronaves.

La influencia de aspectos meteorológicos se observó en un total de 15 de estos sucesos (uno de estos casos ocurrió en Argentina, otro en Canadá y los 13 restantes, en Estados Unidos). Los 15 casos ocurrieron durante la carrera de aterrizaje, y en ellos, se observó que principalmente la lluvia y el viento cruzado, sumados a una falta de corrección oportuna por parte del piloto al mando, fueron los factores determinantes. En pocos casos se observó la participación de contaminación por agua, hielo y nieve en la pista.

Los sucesos relativos a Contacto Anormal con la Pista, se originaron principalmente producto de aterrizajes duros, descentrados o con actitudes anormales, que en algunos casos originaron daños al tren de aterrizaje y los neumáticos, provocando las salidas de pista.

En 9 casos, se registró una relación entre fallas de componente/sistema y pérdidas de control en superficie (uno en Bahamas, uno en Brasil y los siete restantes en Estados Unidos). Se observó que los sistemas que presentaron fallas fueron principalmente de control direccional en tierra (guía de la rueda de nariz), de frenado (frenos y sistema hidráulico) y reversos.

En cinco casos, se pudo apreciar la relación entre Contacto Anormal con la Pista y Falla de Sistema/Componente – No Motor. Estos casos se refirieron a problemas relativos al tren de aterrizaje, que ocasionaron su repliegue total o parcial durante las fases finales de la aproximación y el aterrizaje.

En tres casos se observó una relación entre Contacto Anormal con la Pista y Pérdida de Control en Superficie. Estos casos se produjeron como consecuencia de aterrizajes duros o con rebotes.

# Consideraciones finales

---

Sin perjuicio de las acotaciones efectuadas en los puntos anteriores, es necesario señalar que en general, la profundidad con que se encuentran abordados los reportes puede ser mejorada, especialmente en lo que se refiere a la relevancia de los aspectos meteorológicos y la identificación de los aeródromos involucrados. De esta forma, se podría eventualmente, llegar a contar con datos más representativos de la realidad de la Región Panamericana.

## Apéndice. Resumen de casos.

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
5001340	Argentina	09/04/2005	2 251 to 5 700 Kg	CESSNA - 414	Private owner	Business	None	Landing	VMC	
8003990	Argentina	26/01/2008	2 251 to 5 700 Kg	BEECH - 90 (90 KING AIR)	Sales/rental/service	Business	None	Landing	VMC	No
6000510	Argentina	25/02/2006	2 251 to 5 700 Kg	OTHER (BEECH KING AIR A100)	Other	Other	None	Landing	IMC	No
6000810	Argentina	16/03/2006	5 701 to 27 000 Kg	LEARJET - 35	Corporate/executive	Business	None	Landing	IMC	Yes
9002580	Argentina	11/11/2009	2 251 to 5 700 Kg	BEECH - 55	Private owner	Unknown	None	Landing		
10000020	Argentina	03/01/2010	2 251 to 5 700 Kg	BEECH - 55	Private owner	Unknown	Serious	Take-off	VMC	No
A06-20215	Bahamas	24/05/2006	5 701 to 27 000 Kg	OTHER (IAI-1124(ISRAEL))	Corporate/executive	Emergency Medical Service	None	En route	IMC	
A08-25741	Bahamas	03/11/2007	2 251 to 5 700 Kg	PIPER - PA23 - 250	Private owner	Passenger	None	Landing		
A11-01314	Bahamas	04/07/2011	2 251 to 5 700 Kg	CESSNA - 421	Private owner	Pleasure	None	Take-off	VMC	
A12-01272	Bahamas	14/07/2012	2 251 to 5 700 Kg	PIPER - PA31P - 350	Unknown	General Aviation	Unknown	En route	VMC	No
A13-02444	Bahamas	13/06/2013	5 701 to 27 000 Kg	SAAB - 340	Corporate/executive	Passenger	None	Landing	IMC	Yes
7100415	Belize	04/12/2007	2 251 to 5 700 Kg	CESSNA - 208		Passenger	None	Take-off		
3000110	Bolivia	17/01/2003	5 701 to 27 000 Kg	BAE - JETSTREAM3100		Passenger	None	Take-off	VMC	
9101016	Bolivia	01/12/2009	5 701 to 27 000 Kg	FAIRCHILD (SA227 III)		Passenger	None	Landing		
9101057	Bolivia	27/12/2009	5 701 to 27 000 Kg	SWEARINGEN - SA227 - AC		Passenger	None	Landing	VMC	Yes
SCZ-AIG-122-13	Bolivia	20/08/2013		FAIRCHILD (SA227 III)		Passenger	None	Landing		
3000890	Brazil	23/03/2003	5 701 to 27 000 Kg	MITSUBISHI - MU300	Corporate/executive	Business	None	Landing	IMC	
3000220	Brazil	04/01/2003	2 251 to 5 700 Kg	CESSNA - 525 - CITATIONJET	Sales/rental/service	Air taxi	None	Landing	VMC	
2007160	Brazil	07/12/2002	2 251 to 5 700 Kg	OTHER (NE-821 CARAJA(NEIVA))	Private owner	Business	Fatal	Landing	VMC	No
2000560	Brazil	18/03/2002	27 001 to 272 000 Kg	BOEING - 727 - 100 (GUPPY-101)	Sales/rental/service	Cargo	None	Landing	VMC	No
3002800	Brazil	20/10/2003	5 701 to 27 000 Kg	FOKKER - F27 - 500	Sales/rental/service	Passenger	None	Landing		
3002730	Brazil	23/07/2003	5 701 to 27 000 Kg	CESSNA - 551 - CITATION II	Private owner	Business	Serious	Approach	VMC	No
2003880	Brazil	07/10/2002	5 701 to 27 000 Kg	LEARJET - 60	Private owner	Other	Fatal	Landing	VMC	Yes
3005630	Brazil	25/09/2003	2 251 to 5 700 Kg	OTHER (NE-821 CARAJA(NEIVA))	Private owner	General Aviation	None	Landing	VMC	No
3003760	Brazil	06/11/2003	27 001 to 272 000 Kg	AIRBUS - A320		Revenue operations	None	Landing		

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
NT 057 N313PC 10	Brazil	20/05/2010	2 251 to 5 700 Kg	PIPER - PA42			None			
NT 057 PT-LHO 11	Brazil	19/04/2011	2 251 to 5 700 Kg	EMBRAER - EMB820 - C	Private owner	Other	None	Landing	VMC	
NT 075 PT-SHU 11	Brazil	24/05/2011	2 251 to 5 700 Kg	EMBRAER - EMB110	Sales/rental/service	Passenger	None	Take-off		
NT 136 PT-LJ 11	Brazil	07/10/2011	5 701 to 27 000 Kg	CESSNA - 551 - CITATION II	Sales/rental/service	General Aviation	Minor	Landing		
NT 024 PR-TTI 11	Brazil	21/02/2011	5 701 to 27 000 Kg	ATR - ATR72 - 200	Sales/rental/service	Passenger	Minor	Landing		
NT 052 PR-FMM 11	Brazil	08/04/2011	2 251 to 5 700 Kg	AIR TRACTOR - AT502	Sales/rental/service	Agricultural	None	Take-off		
NT169 PR-SER 11	Brazil	26/11/2011	2 251 to 5 700 Kg	AIR TRACTOR - AT502	Sales/rental/service	Agricultural	None	Landing		
5001750	Brazil	29/03/2005	2 251 to 5 700 Kg	CESSNA - 208		Cargo	None	Landing	Unknown	Unknown
7100172	Brazil	17/07/2007	27 001 to 272 000 Kg	AIRBUS - A320	Sales/rental/service	Passenger	Fatal	Landing	IMC	No
7100205	Brazil	16/07/2007	5 701 to 27 000 Kg	ATR - ATR42 - 300	Sales/rental/service	Passenger	None	Landing	IMC	Yes
8003980	Brazil	21/04/2008	2 251 to 5 700 Kg	EMBRAER - EMB110	Sales/rental/service	Passenger	Minor	En route		
8001490	Brazil	11/06/2008	2 251 to 5 700 Kg	BEECH - 55	Sales/rental/service	Cargo	None	En route		
8001770	Brazil	07/08/2008	2 251 to 5 700 Kg	EMBRAER - EMB820 - C	Sales/rental/service	Passenger	None	Landing		
8003820	Brazil	18/12/2008	2 251 to 5 700 Kg	BEECH - 90 (90 KING AIR)	Sales/rental/service	Passenger	None	Landing		
9000580	Brazil	01/01/2009	2 251 to 5 700 Kg	OTHER (North American AT6D)	Private owner	Ferry/positioning	Minor	En route		
9002340	Brazil	12/10/2009	2 251 to 5 700 Kg	OTHER (EMBRAER EMB-500)	Corporate/executive	Business	None	Landing		
9002830	Brazil	13/11/2009		AIR TRACTOR - AT401	Other	General Aviation	None	Take-off		
9003300	Brazil	15/02/2009	0-2 250 Kg	RAYTHEON (36 BONANZA (PISTON))	Private owner	General Aviation	None	Take-off		
8100407	Brazil	03/09/2008	2 251 to 5 700 Kg	RAYTHEON (90 KING AIR)	Corporate/executive	Business	Minor	Take-off		
8100619	Brazil	10/10/2008	2 251 to 5 700 Kg			Air taxi	None	Landing		Unknown
NT 208 PR-CRM 12	Brazil	07/12/2012	2 251 to 5 700 Kg	BEECH - G58	Private owner	Local	None	Landing		
10000610	Brazil	19/03/2010	2 251 to 5 700 Kg	BEECH - 55	Other	Other	None	Landing		
9001040	Brazil	08/05/2009	5 701 to 27 000 Kg	AIR TRACTOR - AT802	Private owner	Aerial Work	None	Approach		
9001270	Brazil	18/06/2009	2 251 to 5 700 Kg	EMBRAER - EMB820 - C	Government agency	Dual	None	Landing		
9001280	Brazil	13/06/2009	2 251 to 5 700 Kg	BEECH - 90 (90 KING AIR)	Corporate/executive	General Aviation	None	Approach		
3002000	Canada	07/03/2003	5 701 to 27 000 Kg	BEECH - 300	Corporate/executive	Business	None	Landing		
3000310	Canada	27/01/2003	5 701 to 27 000 Kg	BEECH - 1900		Passenger	None	Landing		
2020180	Canada	04/03/2002	5 701 to 27 000 Kg	FAIRCHILD (SA227 III)		Passenger	None	Landing		



File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
4003790	Canada	24/12/2004	2 251 to 5 700 Kg	BEECH - 100		Air taxi	None	Landing		
4003670	Canada	16/12/2004	5 701 to 27 000 Kg	SHORT - SD360		Cargo	Serious	Landing	IMC	
4003460	Canada	01/12/2004	5 701 to 27 000 Kg	BEECH - 300	Corporate/executive	Business	None	Landing		
4002800	Canada	14/10/2004	> 272 000 Kg	BOEING - 747 (747-100/200)		Cargo	Fatal	Take-off		
4000960	Canada	19/04/2004	2 251 to 5 700 Kg	BEECH - 100		Unknown	None	Landing		
4000030	Canada	01/01/2004	2 251 to 5 700 Kg	BEECH - 100		Revenue operations	None	Take-off	IMC	Yes
2024880	Canada	16/04/2002	2 251 to 5 700 Kg	SWEARINGEN - SA226 - TC		Passenger	None	Landing		
5002830	Canada	02/08/2005	27 001 to 272 000 Kg	AIRBUS - A340 - 300	Not applicable	Passenger	Serious	Landing	IMC	Yes
10100228	Canada	12/04/2010	2 251 to 5 700 Kg	DE HAVILLAND - DHC6 - 300		Air taxi	None	Take-off		
10100371	Canada	22/05/2010	2 251 to 5 700 Kg	BEECH - 60		Cross-country	None	Landing	Unknown	No
10100411	Canada	16/06/2010	5 701 to 27 000 Kg	EMBRAER - EMB145 - ER		Passenger	Minor	Landing		Unknown
J2011053	Canada	04/09/2011	5 701 to 27 000 Kg	OTHER (ERJ-145(HARBIN EMBRAER))		Passenger	None	Landing		Yes
6008090	Canada	29/12/2006	27 001 to 272 000 Kg	MCDONNELL DOUGLAS (DC-4 SKYMASTER/C-54)		Cargo	Minor			
6008360	Canada	08/03/2006	2 251 to 5 700 Kg	PIPER - PA31		Ferry/positioning	Fatal	Landing		
A11C0018	Canada	09/02/2011	5 701 to 27 000 Kg	RAYTHEON (1900)		Passenger	Minor	Landing	VMC	Yes
T2011035	Canada	05/07/2011	5 701 to 27 000 Kg	SHORT - SC7		Cargo	None	Landing	VMC	No
B2011013	Canada	12/03/2011	5 701 to 27 000 Kg	BOMBARDIER - BD700 1A11 (BD-100 Challenger 300)		Other	None	Landing	Unknown	
B2011029	Canada	17/06/2011	5 701 to 27 000 Kg	DASSAULT - FALCON10		Unknown	None	Landing		No
6000080	Canada	05/01/2006	27 001 to 272 000 Kg	MCDONNELL DOUGLAS (DC-4 SKYMASTER/C-54)		Unknown	None	Take-off		
9100996	Canada	06/12/2009	5 701 to 27 000 Kg	OTHER (ASTRA IV (GALAXY)(ISRAEL))		Business	None	Landing	VMC	Yes
7100309	Canada	11/11/2007	27 001 to 272 000 Kg	BOMBARDIER - BD700 1A10 - NO SERIES EXISTS	Corporate/executive	General Aviation	Minor	Landing		
5004380	Canada	15/11/2005	5 701 to 27 000 Kg	OTHER (ASTRA SPX (1125SPX)(ISRAEL))		Passenger	None	Landing		
8100408	Canada	31/08/2008	2 251 to 5 700 Kg	EMBRAER - EMB110		Training/check	None	Landing		
9100352	Canada	02/06/2009	2 251 to 5 700 Kg	DE HAVILLAND - DHC6 - 300		Passenger	Minor	Landing		
9100716	Canada	02/09/2009	2 251 to 5 700 Kg	ROCKWELL - 680		Local	None	Landing	Unknown	No
7002490	Canada	25/10/2007	2 251 to 5 700 Kg	BEECH - 100		Air taxi	Fatal	Landing		
8100181	Canada	27/05/2008	2 251 to 5 700 Kg	BEECH - 200		Passenger	None	Taxi	VMC	No

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
9100006	Canada	04/01/2009	5 701 to 27 000 Kg	CESSNA - 650 - CITATION VII		Business	None	Landing		
9100045	Canada	14/01/2009	2 251 to 5 700 Kg	BEECH - 100		Air taxi	None	Take-off		
9100070	Canada	04/02/2009	2 251 to 5 700 Kg	DE HAVILLAND - DHC6 (DHC6 TWIN OTTER)		Passenger	Minor	Take-off		
9100530	Canada	15/07/2009	2 251 to 5 700 Kg	CANADAIR - T33	Private owner	Ferry/positioning	None	Take-off		No
9100551	Canada	21/07/2009	2 251 to 5 700 Kg	BEECH - 100		Air taxi	None	Landing		
9100874	Canada	09/10/2009	2 251 to 5 700 Kg	CESSNA - 421		Air taxi	None	Landing		Yes
1387WM	Chile	18/06/2005	2 251 to 5 700 Kg	CESSNA - 402	Sales/rental/service	Passenger	Minor	Take-off	VMC	Yes
1447AE	Chile	23/01/2007	2 251 to 5 700 Kg	BEECH - 55	Private owner	Pleasure	None	Landing	VMC	No
1585CG	Chile	15/04/2011	2 251 to 5 700 Kg	PIPER - PA31T - 2	Sales/rental/service	Cargo	Minor	Landing		No
2000720	Colombia	19/04/2002	5 701 to 27 000 Kg	ANTONOV - AN32		Cargo	Fatal	Take-off	Unknown	
4000930	Colombia	28/04/2004	27 001 to 272 000 Kg	MCDONNELL DOUGLAS - DC10 - 30		Cargo	Minor	Landing	VMC	
2001400	Colombia	14/06/2002	27 001 to 272 000 Kg	MCDONNELL DOUGLAS (DC-9-10)		Passenger	None	Landing	VMC	
COL-08-03-GIA	Colombia	28/01/2008	2 251 to 5 700 Kg	DE HAVILLAND - DHC8 - 300	Sales/rental/service	Passenger	Minor	Landing	VMC	No
COL-08-15-GIA	Colombia	30/07/2008		CESSNA - 152	Flying club/school	Flight Training/Instructional	None	Landing	VMC	
COL-08-31-GIA	Colombia	12/12/2008	5 701 to 27 000 Kg	LET - L410 - UVPE	Sales/rental/service	Revenue operations	Minor	Landing	VMC	Yes
COL-09-01-GIA	Colombia	16/01/2009	0-2 250 Kg	CESSNA - 172	Private owner	Pleasure	None	Landing	VMC	
COL-09-12-GIA	Colombia	01/05/2009	0-2 250 Kg	CESSNA - 172	Flying club/school	Dual	None	Landing	VMC	No
COL-09-23-GIA	Colombia	26/06/2009		LET - L410 - UVPE	Sales/rental/service	Other	None	Landing	VMC	
COL-09-33-GIA	Colombia	15/10/2009		CESSNA - 402	Sales/rental/service	Air taxi	None	Landing	VMC	
COL-10-11-GIA	Colombia	05/05/2010		EMBRAER - EMB145 - ER	Sales/rental/service	Passenger	Minor	Landing	IMC	
10100276	Colombia	05/05/2010	5 701 to 27 000 Kg	EMBRAER - EMB145 - ER	Sales/rental/service	Passenger	Minor	Landing	IMC	Yes
6002490	Colombia	07/06/2006	> 272 000 Kg	BOEING - 747 (747-100/200)		Cargo	None	Take-off	IMC	Unknown
7100174	Colombia	17/07/2007	27 001 to 272 000 Kg	EMBRAER - ERJ190 (190 / 195)		Passenger	Minor	Landing		
7100209	Colombia	21/08/2007	27 001 to 272 000 Kg	ANTONOV - AN26		Passenger	Unknown	Approach		
8100032	Colombia	28/01/2008	5 701 to 27 000 Kg	DE HAVILLAND - DHC8		Passenger	Minor	Landing		
9002420	Colombia	19/10/2009	2 251 to 5 700 Kg	AIR TRACTOR - AT301		Agricultural	None	Take-off	VMC	
9001460	Colombia	26/06/2009	5 701 to 27 000 Kg	LET - L410 - UVPE		Passenger	None	Approach		
8100671	Costa Rica	30/11/2008	2 251 to 5 700 Kg	DE HAVILLAND - DHC6 - 300		Passenger	None	Landing		

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
7001910	Costa Rica	03/09/2007	2 251 to 5 700 Kg	ROCKWELL (SABRELINER 85)	Private owner	Unknown	None	Take-off		
3003080	Cuba	14/06/2003	5 701 to 27 000 Kg	ANTONOV - AN24		Passenger	None	Landing	VMC	
7100252	Dominica	11/08/2007	5 701 to 27 000 Kg	LEARJET - 35		Passenger	None		VMC	No
3001850	Ecuador	17/01/2003	27 001 to 272 000 Kg	FOKKER - F28 - 4000		Passenger	None	Take-off	VMC	
J2011058	Ecuador	16/09/2011	27 001 to 272 000 Kg	EMBRAER - ERJ190 (190 / 195)		Passenger	None	Landing		
5001460	Ecuador	07/04/2005	27 001 to 272 000 Kg	FOKKER - F28 - 4000		Passenger	Serious	Landing	VMC	
8100436	Ecuador	22/09/2008	27 001 to 272 000 Kg	FOKKER - F28 - 4000		Passenger	Minor	Take-off	VMC	Yes
7100305	Ecuador	09/11/2007	> 272 000 Kg	AIRBUS - A340 - 600		Passenger	None	Landing		
10000050	Ecuador	08/01/2010	2 251 to 5 700 Kg	AIR TRACTOR - AT502		Unknown	Serious	Take-off		
10000120	Ecuador	13/01/2010	0-2 250 Kg	GRUMMAN - G164		Agricultural	None	Landing		
J2011040	Guyana	30/07/2011	27 001 to 272 000 Kg	BOEING - 737		Passenger	Serious	Landing	IMC	Yes
T2011013	Haiti	13/02/2011	5 701 to 27 000 Kg	OTHER (BAE-3200 JETSTREAM SUPER 31(JETSTREAM))		Passenger	None	Landing		
6001370	Haiti	28/04/2006	5 701 to 27 000 Kg	BAE - JETSTREAM3100		Passenger	Serious	Landing		
8100183	Honduras	30/05/2008	27 001 to 272 000 Kg	AIRBUS - A320		Passenger	Fatal	Landing		
9101041	Jamaica	22/12/2009	27 001 to 272 000 Kg	BOEING - 737 - 800		Passenger	Unknown	Landing	IMC	Yes
10100119	Mexico	11/02/2010	27 001 to 272 000 Kg	FOKKER - F27 - 100		Passenger	None	Approach		
9200510	Mexico	05/02/2009	5 701 to 27 000 Kg	LEARJET - 35		Unknown	None	Landing	VMC	
9100378	Panama	17/05/2009	2 251 to 5 700 Kg	DE HAVILLAND - DHC6 - 300		Passenger	None	Landing		No
4001090	Puerto Rico	09/05/2004	5 701 to 27 000 Kg	ATR - ATR72 - 200		Passenger	Serious	Landing	VMC	No
9100842	Suriname	15/10/2009	5 701 to 27 000 Kg	PZL OKECIE (AN-28)		Revenue operations	Serious	Landing		
2004770	United States	15/09/2002	2 251 to 5 700 Kg	CESSNA - 421		Pleasure	None	Landing	IMC	Yes
3000640	United States	08/03/2003	5 701 to 27 000 Kg	FOKKER - F27 - 500		Cargo	None	Landing	VMC	No
3000290	United States	21/01/2003	2 251 to 5 700 Kg	DE HAVILLAND - DHC6 (DHC6 TWIN OTTER)		Passenger	None	Landing	VMC	No
3000240	United States	06/01/2003	5 701 to 27 000 Kg	EMBRAER - EMB145 - ER		Passenger	None	Landing	IMC	Yes
2005820	United States	22/11/2002	5 701 to 27 000 Kg	SWEARINGEN - SA227 - AC		Passenger	None	Landing	VMC	
2003230	United States	09/07/2002	2 251 to 5 700 Kg	BEECH - 55		Ferry/positioning	None	Landing	VMC	No
2003050	United States	24/06/2002	2 251 to 5 700 Kg	BEECH - G58		Pleasure	None	Approach	VMC	No
2002860	United States	25/05/2002	2 251 to 5 700 Kg	NORTH AMERICAN (COMMANDER 500)		Business	None	Landing	VMC	No

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
2002710	United States	02/05/2002	5 701 to 27 000 Kg	CESSNA - 560 - CITATION V		Business	None	Landing	VMC	
2002550	United States	03/04/2002	2 251 to 5 700 Kg	CESSNA - 310		Pleasure	Serious	Landing	VMC	
2002150	United States	24/01/2002	2 251 to 5 700 Kg	CESSNA - 208		Cargo	Minor	Take-off	IMC	
4021360	United States	10/07/2004	2 251 to 5 700 Kg	CESSNA - 401		Pleasure	None	Landing	VMC	No
4015360	United States	16/06/2004	2 251 to 5 700 Kg	CESSNA - 421		Pleasure	None	Take-off	VMC	No
4015250	United States	12/06/2004	2 251 to 5 700 Kg	DE HAVILLAND - DHC2 - I		Business	None	Landing	VMC	No
4013810	United States	26/03/2004	2 251 to 5 700 Kg	ROCKWELL (THRUSH COMMANDER)		Agricultural	None		VMC	
4013310	United States	15/03/2004	5 701 to 27 000 Kg	BEECH - 1900		Passenger	None	Landing	VMC	No
4013140	United States	15/04/2004	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ		Pleasure	None	Landing	VMC	No
4012690	United States	08/04/2004	2 251 to 5 700 Kg	AYRES - S2R600 - T660		Agricultural	None	Landing	VMC	Yes
4012560	United States	31/03/2004	2 251 to 5 700 Kg	SWEARINGEN - SA226 - TC		Business	None	Take-off	VMC	No
4012380	United States	11/03/2004	2 251 to 5 700 Kg	AYRES (THRUSH COMMANDER)		Agricultural	Minor	Take-off	VMC	
4012050	United States	17/01/2004	2 251 to 5 700 Kg	CESSNA - 310		Pleasure	None	Landing	IMC	Yes
4011630	United States	21/01/2004	5 701 to 27 000 Kg	DASSAULT - MYSTERE FALCON20		Pleasure	None	Landing	VMC	No
4011290	United States	11/01/2004	2 251 to 5 700 Kg	NORTH AMERICAN (COMMANDER 500)		Pleasure	None	Take-off	VMC	No
4003990	United States	25/09/2004	2 251 to 5 700 Kg	OTHER (AHC Bushmaster 2000)	Private owner	Airshow/race	Serious	Take-off	VMC	No
4003760	United States	19/07/2004	5 701 to 27 000 Kg	LEARJET - 55 (54/55)		Ferry/positioning	None	Landing	IMC	Yes
4000730	United States	19/03/2004	5 701 to 27 000 Kg	LEARJET - 35		Cargo	None	Landing	IMC	No
4000650	United States	20/02/2004	5 701 to 27 000 Kg	LEARJET - 25		Passenger	Serious	Landing	VMC	No
3042000	United States	16/07/2003	5 701 to 27 000 Kg	OTHER (MILITARY(MIKOYAN))		General Aviation	None	Take-off	VMC	No
3041880	United States	10/07/2003	2 251 to 5 700 Kg	SNOW (S2R)		Agricultural	Minor	Take-off	VMC	No
3038020	United States	18/05/2003	5 701 to 27 000 Kg	BEECH - 300		Pleasure	Minor	Landing	VMC	No
3038000	United States	19/05/2003	2 251 to 5 700 Kg	PIPER - PA31P - 350		Cargo	None	Landing	VMC	No
3036680	United States	17/03/2003	2 251 to 5 700 Kg	BEECH - 100		Pleasure	None	Landing	IMC	Yes
3033040	United States	17/01/2003	2 251 to 5 700 Kg	OTHER (EXPERIMENTAL(MISCELLANEOUS))		Test/experimental	None	Landing	VMC	No
3004210	United States	18/12/2003	27 001 to 272 000 Kg	MCDONNELL DOUGLAS - DC10 - 30		Cargo	Minor	Landing	VMC	
3004050	United States	11/11/2003	5 701 to 27 000 Kg	CESSNA - 560 - CITATION V		Passenger	None	Take-off	VMC	No
3002810	United States	24/05/2003	27 001 to 272 000 Kg	BOEING - 737 - 300		Revenue operations	None	Landing	IMC	Yes

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
2105920	United States	04/06/2002	2 251 to 5 700 Kg	BEECH - 100		Pleasure	None	Landing	VMC	No
2101570	United States	01/02/2002	2 251 to 5 700 Kg	BRITTEN NORMAN - BN2A		Passenger	None	Take-off	VMC	Yes
2005080	United States	17/11/2002	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ		Pleasure	None	Landing	VMC	No
2004950	United States	16/10/2002	2 251 to 5 700 Kg	PILATUS - PC12		Business	Minor	Take-off	IMC	
2003990	United States	29/09/2002	5 701 to 27 000 Kg	FAIRCHILD (SA227 III)		Passenger	Serious	Take-off	VMC	
2003820	United States	30/08/2002	5 701 to 27 000 Kg	LEARJET - 25		Passenger	Fatal	Landing	VMC	No
2003810	United States	28/08/2002	27 001 to 272 000 Kg	AIRBUS - A320		Passenger	Serious	Landing	VMC	
2003550	United States	13/08/2002	5 701 to 27 000 Kg	CESSNA - 551 - CITATION II		Passenger	None	Landing	VMC	No
2003350	United States	19/07/2002	2 251 to 5 700 Kg	BEECH - G58		Pleasure	None	Landing	IMC	No
2003330	United States	12/07/2002	2 251 to 5 700 Kg	AYRES - S2R600 - T660		Agricultural	None	Take-off	VMC	No
2003240	United States	06/07/2002	2 251 to 5 700 Kg	BEECH - 50		Pleasure	None	Landing	VMC	No
2001300	United States	20/05/2002	5 701 to 27 000 Kg	CESSNA - 551 - CITATION II		Business	Minor	Take-off	VMC	No
2001290	United States	01/05/2002	5 701 to 27 000 Kg	BEECH - 400		Business	None	Landing	VMC	No
2001030	United States	25/03/2002	5 701 to 27 000 Kg	MITSUBISHI - MU300		Passenger	None	Landing	IMC	
2001000	United States	10/02/2002	5 701 to 27 000 Kg	MITSUBISHI - MU300		Pleasure	None	Landing	IMC	
5000280	United States	02/02/2005	5 701 to 27 000 Kg	CANADAIR - CL600 1A11 - 600 - 600		Passenger	Serious	Take-off	VMC	Unknown
4030690	United States	15/12/2004	2 251 to 5 700 Kg	PIPER - PA31P - 350		Passenger	None	Landing	VMC	
4030010	United States	22/12/2004	2 251 to 5 700 Kg	BEECH - G58		Pleasure	None	Landing	VMC	No
4024050	United States	21/09/2004	2 251 to 5 700 Kg	OTHER (AEROSTAR 601P(SMITH))		Business	None	Take-off	VMC	No
4023870	United States	08/09/2004	2 251 to 5 700 Kg	CESSNA - 402		Cargo	None	Take-off	VMC	Yes
4022740	United States	06/08/2004	2 251 to 5 700 Kg	GRUMMAN - G164		Agricultural	None	Landing	VMC	No
4021940	United States	05/09/2004	2 251 to 5 700 Kg	SCHWEIZER (G164 B/600)		Ferry/positioning	None	Landing	VMC	No
4021730	United States	16/07/2004	0-2 250 Kg	GRUMMAN - G164		Agricultural	None	Landing	VMC	No
3049870	United States	24/11/2003	2 251 to 5 700 Kg	CESSNA - 340		Pleasure	None	Landing	VMC	No
3048700	United States	28/10/2003	2 251 to 5 700 Kg	CESSNA - 310		Pleasure	None	Landing	IMC	
3048540	United States	01/11/2003	5 701 to 27 000 Kg	SWEARINGEN - SA227 - AC		Cargo	None	Landing	IMC	Yes
3003510	United States	19/09/2003	5 701 to 27 000 Kg	LEARJET - 25		Ferry/positioning	Fatal	Landing	VMC	No
2004660	United States	15/09/2002	2 251 to 5 700 Kg	CESSNA - 310		Pleasure	None	Landing	IMC	Yes

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
2004000	United States	07/10/2002	2 251 to 5 700 Kg	CESSNA - 525 - CITATIONJET		Business	Serious	Landing	VMC	No
20110404X65832	United States	23/03/2011	5 701 to 27 000 Kg	DASSAULT - FALCON10	Private owner	Business	None	Landing	VMC	Yes
4029280	United States	20/12/2004	5 701 to 27 000 Kg	LEARJET - 25		Ferry/positioning	None	Landing	VMC	No
4028560	United States	01/12/2004	5 701 to 27 000 Kg	GULFSTREAM - GIV		Revenue operations	None	Landing	VMC	
4028470	United States	05/12/2004	5 701 to 27 000 Kg	DASSAULT - MYSTERE FALCON20		Business	None	Landing	IMC	
4028430	United States	04/12/2004	5 701 to 27 000 Kg	CONVAIR - 580		Test/experimental	None	Landing	IMC	Yes
4028370	United States	29/11/2004	27 001 to 272 000 Kg	GULFSTREAM - GIV		Business	None	Landing	VMC	No
4026740	United States	10/08/2004	2 251 to 5 700 Kg	CESSNA - 310		Pleasure	None	Take-off	VMC	
4025580	United States	03/10/2004	5 701 to 27 000 Kg	LOCKHEED - 18		Pleasure	Minor	Take-off	VMC	No
3051440	United States	04/12/2003	2 251 to 5 700 Kg	CESSNA - 525 - CITATIONJET		Pleasure	None	Landing	IMC	No
3051300	United States	17/09/2003	2 251 to 5 700 Kg	BELLANCA - CH300		Pleasure	None	Landing	VMC	No
3045630	United States	09/09/2003	2 251 to 5 700 Kg	AYRES (THRUSH COMMANDER)		Agricultural	None	Take-off	VMC	No
3044130	United States	18/08/2003	5 701 to 27 000 Kg	BEECH - 400		Ferry/positioning	None	Take-off	VMC	
3044040	United States	15/08/2003	2 251 to 5 700 Kg	AIR TRACTOR - AT502		Agricultural	None	Take-off	VMC	No
10200531	United States	03/05/2010	2 251 to 5 700 Kg	AYRES - S2R600 - T660	Unknown	Agricultural	None	Landing	VMC	
2007100014	United States	02/01/2007	2 251 to 5 700 Kg	SWEARINGEN - SA226 - TC		Business	None	Landing	VMC	
2007100027	United States	15/01/2007	2 251 to 5 700 Kg	PIAGGIO - P180 - AVANTI		Pleasure	None	Landing	VMC	
20110311X33741	United States	10/03/2011	5 701 to 27 000 Kg	FAIRCHILD (SA227 III)		Cargo	None	Landing	VMC	
20110312X24318	United States	04/03/2011	5 701 to 27 000 Kg	LEARJET - 25		Business	None	Landing	IMC	
ERA11LA117	United States	17/01/2011	5 701 to 27 000 Kg	CONVAIR - 340	Unknown	Ferry/positioning	None	Take-off	VMC	No
10100016	United States	08/01/2010	5 701 to 27 000 Kg	DASSAULT - MYSTERE FALCON20	Private owner	Business	None	Take-off	VMC	
10100035	United States	02/01/2010	2 251 to 5 700 Kg	SWEARINGEN - SA226 - TC		Air taxi	None	Landing	VMC	No
10100255	United States	27/02/2010	2 251 to 5 700 Kg	CESSNA - 340	Private owner	Business	Minor	Landing	VMC	
10200087	United States	01/02/2010	2 251 to 5 700 Kg	CESSNA - 402		Passenger	None	Landing	VMC	
10200090	United States	09/02/2010	2 251 to 5 700 Kg	BEECH - G58		Pleasure	None	Take-off	VMC	
10200124	United States	04/02/2010	2 251 to 5 700 Kg	MITSUBISHI - MU2B - 60		Passenger	None	Landing	IMC	
10200131	United States	20/02/2010	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ	Private owner	Pleasure	None	Landing	VMC	
10200180	United States	11/03/2010	2 251 to 5 700 Kg	NORTH AMERICAN (NA73 MUSTANG)		Pleasure	Fatal	Landing	VMC	Unknown

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
10200229	United States	04/02/2010	2 251 to 5 700 Kg	PIPER - PA31T	Private owner	Pleasure	None	Landing	VMC	
10200281	United States	22/04/2010	2 251 to 5 700 Kg	GRUMMAN - G164		Agricultural	None		VMC	
10200296	United States	03/04/2010	2 251 to 5 700 Kg	MITSUBISHI - MU2		Pleasure	Minor	Landing	VMC	
10200555	United States	31/03/2010	2 251 to 5 700 Kg	BEECH - 55	Private owner	Pleasure	None	Landing	VMC	
10200603	United States	21/06/2010	2 251 to 5 700 Kg	CESSNA - 525 - CITATIONJET	Corporate/executive	Business	None	Landing	VMC	
10200656	United States	21/05/2010	2 251 to 5 700 Kg	AYRES (THRUSH COMMANDER)	Unknown	Agricultural	None	Take-off	VMC	
10200670	United States	14/07/2010	2 251 to 5 700 Kg	CESSNA - 310	Sales/rental/service	Pleasure	None	Take-off	VMC	
10200692	United States	21/07/2010	2 251 to 5 700 Kg	SCHWEIZER (G164 B/600)		Agricultural	None	Take-off	VMC	
10200723	United States	26/06/2010	5 701 to 27 000 Kg	LOCKHEED - P2V		Fire fighting	None	Landing	VMC	No
10200823	United States	22/05/2010	2 251 to 5 700 Kg	PZL SWIDNIK (M18 / M18A / M18AS (DROMADER))		Agricultural	None	Take-off	VMC	
S2011038	United States	16/03/2011	2 251 to 5 700 Kg	DE HAVILLAND (DHC3 TURBO-OTTER)		Cargo	None	Landing		
10200943	United States	04/06/2010	2 251 to 5 700 Kg	CESSNA - 421	Unknown	Ferry/positioning	None	Take-off	VMC	
WPR11LA093	United States	09/01/2011	2 251 to 5 700 Kg	PIPER - PA46 - 500TP	Unknown		None	Landing	VMC	
10201051	United States	17/06/2010	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ	Flying club/school	Flight Training/Instructional	None	Landing	VMC	
11100117	United States	10/03/2011	5 701 to 27 000 Kg	SWEARINGEN - SA227 - AC		Cargo	None	Landing	VMC	Yes
2006-0356	United States	22/12/2006	2 251 to 5 700 Kg	BEECH - 99		Ferry/positioning	None	Landing	IMC	Yes
2006100297	United States	22/03/2006	5 701 to 27 000 Kg	LEARJET - 35		Cargo	None	Take-off	VMC	No
20100111X20317	United States	08/01/2010	0-2 250 Kg	PIPER - PA28	Flying club/school	Flight Training/Instructional	None	Landing	VMC	
20100310X51327	United States	05/03/2010	0-2 250 Kg	CESSNA - 206			None	Landing	VMC	
20100415X83057	United States	05/04/2010	0-2 250 Kg	PIPER - PA32	Private owner	Pleasure	None	Landing	VMC	
20100510X81424	United States	01/05/2010	0-2 250 Kg	BEECH - 76 - NO SERIES EXISTS	Flying club/school	Flight Training/Instructional	None	Approach	VMC	
20100521X04119	United States	21/05/2010	0-2 250 Kg	CESSNA - 210	Private owner	Pleasure	None	Take-off	VMC	
20100531X11238	United States	31/05/2010	0-2 250 Kg	CESSNA - 182	Private owner	Pleasure	Minor	Landing	VMC	
B2011019	United States	13/04/2011	5 701 to 27 000 Kg	CESSNA - 500 - CITATION (525B CITATION CJ3)		Unknown	None	Landing		
B2011038	United States	31/10/2011	5 701 to 27 000 Kg	GULFSTREAM - GV		General Aviation	Serious	Landing	VMC	Yes
B2011043	United States	08/11/2011	5 701 to 27 000 Kg	LEARJET - 55 (54/55)		General Aviation	None	Take-off		
20100608X63203	United States	02/06/2010	0-2 250 Kg	PIPER - PA28	Private owner	Pleasure	None	Landing	VMC	

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
20100623X43404	United States	23/06/2010	0-2 250 Kg	CESSNA - 185	Private owner	Pleasure	None	Take-off	VMC	
20100625X11319	United States	19/06/2010	2 251 to 5 700 Kg	AIR TRACTOR - AT402	Unknown	Agricultural	None	Take-off	VMC	
20100914X84745	United States	15/07/2010		OTHER (MH-1521 BROUSSARD(SOCIÉTÉ DES AVIONS MAX HOLSTE))	Private owner	Pleasure	None	Landing	VMC	Yes
5103890	United States	18/03/2005	2 251 to 5 700 Kg	AIR TRACTOR - AT602 - NO SERIES EXISTS		Agricultural	None	Take-off	VMC	No
5103930	United States	18/04/2005	2 251 to 5 700 Kg	OTHER (Bell-P39)		Pleasure	None	Landing	VMC	No
5104080	United States	09/05/2005	5 701 to 27 000 Kg	ROCKWELL (SABRELINER 80A)		Business	None	Approach	VMC	
5105340	United States	15/05/2005	2 251 to 5 700 Kg	CESSNA - 525 - CITATIONJET		Business	Minor	Landing	VMC	No
5108920	United States	15/07/2005	5 701 to 27 000 Kg	LEARJET - 35		Passenger	Minor	Landing	VMC	
5109410	United States	17/07/2005	2 251 to 5 700 Kg	CESSNA - 525 - CITATIONJET		Business	Minor	Landing	VMC	
5111040	United States	23/06/2005	2 251 to 5 700 Kg	AYRES (THRUSH COMMANDER)		Agricultural	None	Landing	VMC	
5111050	United States	01/07/2005	5 701 to 27 000 Kg	LEARJET - 25		Pleasure	None	Landing	VMC	
5113660	United States	21/08/2005	2 251 to 5 700 Kg	CESSNA - 421		Pleasure	None	Landing	VMC	
5113730	United States	01/09/2005	5 701 to 27 000 Kg	DASSAULT - MYSTERE FALCON20		Cargo	Minor	Take-off	VMC	
5113820	United States	30/07/2005	2 251 to 5 700 Kg	AYRES - S2R600 - T660		Agricultural	None	Take-off	VMC	
5117550	United States	17/10/2005	5 701 to 27 000 Kg	NORTH AMERICAN - NA265		Test/experimental	None	Landing	VMC	
6002480	United States	03/06/2006	5 701 to 27 000 Kg	DORNIER - 328		Ferry/positioning	Minor	Take-off	VMC	No
6002580	United States	24/06/2006	5 701 to 27 000 Kg	CESSNA - 560 - CITATION V		Pleasure	Fatal	Landing	VMC	No
6005030	United States	12/04/2006	2 251 to 5 700 Kg	CESSNA - 310		Pleasure	None	Landing	VMC	No
6005500	United States	02/06/2006	2 251 to 5 700 Kg	PIPER - PA23 - 250		Pleasure	None	Landing	VMC	
6006230	United States	23/07/2006	2 251 to 5 700 Kg	CESSNA - 402		Ferry/positioning	None	Landing	IMC	Yes
6006250	United States	24/07/2006	5 701 to 27 000 Kg	CANADAIR - F86E		Pleasure	Fatal	Take-off	VMC	No
6006380	United States	13/08/2006	2 251 to 5 700 Kg	BEECH - 100		Pleasure	None		VMC	
6006520	United States	02/09/2006	2 251 to 5 700 Kg	DE HAVILLAND (DHC3 OTTER)		Cargo	None	Landing	VMC	Yes
6006920	United States	27/10/2006	2 251 to 5 700 Kg	CESSNA - 310		Pleasure	None	Landing	VMC	No
6007030	United States	12/10/2006	2 251 to 5 700 Kg	BEECH - 55		Pleasure	Minor	En route	VMC	No
6007070	United States	06/10/2006	2 251 to 5 700 Kg	BEECH - G58		Pleasure	None	Landing	VMC	Yes
6007290	United States	07/08/2006	2 251 to 5 700 Kg	PIPER - PA23 - 250		Pleasure	None	Landing	VMC	



File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
6007930	United States	05/01/2006	5 701 to 27 000 Kg	CESSNA - 560 - CITATION V		Passenger	None	Landing	VMC	Yes
7100103	United States	12/04/2007	5 701 to 27 000 Kg	CANADAIR (REGIONAL JET SERIES 100/200)		Passenger	None	Landing	IMC	
8201262	United States	28/09/2008	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ	Corporate/executive	Business	Minor	Landing	VMC	
8201328	United States	30/07/2008	2 251 to 5 700 Kg	SWEARINGEN - SX300		Pleasure	None		VMC	
8201331	United States	18/07/2008	2 251 to 5 700 Kg	ROCKWELL (THRUSH COMMANDER)		Agricultural	None	Take-off	VMC	No
8201340	United States	12/06/2008	2 251 to 5 700 Kg	OTHER (P84 JET PROVOST(HUNTING))	Corporate/executive	Pleasure	None	Approach	VMC	Yes
8201395	United States	29/07/2008	2 251 to 5 700 Kg	NORTH AMERICAN (NA73 MUSTANG)	Unknown	Pleasure	None	Take-off	VMC	No
8201411	United States	23/08/2008	2 251 to 5 700 Kg	SCHWEIZER (G164 B/600)		Agricultural	None	Landing	VMC	Yes
8201448	United States	05/08/2008	2 251 to 5 700 Kg	AIR TRACTOR - AT301		Agricultural	None	Landing	VMC	No
8201449	United States	09/08/2008	2 251 to 5 700 Kg	MORANE SAULNIER - MS760 - A	Private owner	Business	None	Take-off	VMC	No
8201464	United States	29/08/2008	2 251 to 5 700 Kg	GRUMMAN - G164		Agricultural	None	Landing	VMC	No
8201547	United States	06/11/2008	5 701 to 27 000 Kg	OTHER (GENERALATOMICS-MQ-9)		Flight Training/Instructional	None		VMC	
8201586	United States	24/12/2008	2 251 to 5 700 Kg	BEECH - 55	Private owner	Pleasure	Serious	Landing	VMC	Yes
8201599	United States	21/11/2008	2 251 to 5 700 Kg	PIPER - PA60 (PA-60 601/601P)	Private owner	Pleasure	None	Landing	VMC	No
8201757	United States	20/08/2008	2 251 to 5 700 Kg	PIPER - PA46 - 500TP	Corporate/executive	Pleasure	None	Landing	VMC	
8201863	United States	29/08/2008	2 251 to 5 700 Kg	DE HAVILLAND - DHC2 - I	Private owner	Pleasure	None	Take-off	VMC	
8201865	United States	09/08/2008	2 251 to 5 700 Kg	AIR TRACTOR - AT402		Agricultural	None	Landing	VMC	
8201889	United States	05/09/2008	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ	Unknown	Flight Training/Instructional	None	Take-off	VMC	No
8201970	United States	30/09/2008	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ	Private owner	Pleasure	None	Landing	VMC	Yes
7200758	United States	31/03/2007	2 251 to 5 700 Kg	SWEARINGEN - SA226 - TC		Business	None	Landing	VMC	
7200767	United States	30/05/2007	2 251 to 5 700 Kg	CESSNA - 340		Flight Training/Instructional	None	Landing	VMC	
7200795	United States	28/06/2007	2 251 to 5 700 Kg	PIPER - PA31		Ferry/positioning	None	Landing	VMC	
7200830	United States	24/06/2007	2 251 to 5 700 Kg	GRUMMAN - G21		Ferry/positioning	None	Take-off	VMC	
7200888	United States	05/06/2007	2 251 to 5 700 Kg	SCHWEIZER (G164 B/600)		Agricultural	Minor	Landing	VMC	
7200920	United States	23/08/2007	5 701 to 27 000 Kg	LEARJET - 60		Passenger	None	Landing	IMC	
5100080	United States	27/01/2005	2 251 to 5 700 Kg	DE HAVILLAND - DHC6 (DHC6 TWIN OTTER)		Passenger	None	Landing	VMC	
5100360	United States	09/03/2005	5 701 to 27 000 Kg	CANADAIR - CL600 1A11 - 600 - 600		Business	None	Take-off	VMC	Yes

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
5100510	United States	19/01/2005	2 251 to 5 700 Kg	CESSNA - 421		Pleasure	None		IMC	
5100560	United States	10/02/2005	2 251 to 5 700 Kg	ROCKWELL - 690		Pleasure	None	Landing	VMC	No
5100630	United States	28/01/2005	5 701 to 27 000 Kg	LEARJET - 35		Ferry/positioning	None	Landing	IMC	
5100650	United States	11/03/2005	5 701 to 27 000 Kg	CANADAIR - CL600 1A11 - 600 - 600		Passenger	Minor	Landing	IMC	
5100880	United States	19/01/2005	27 001 to 272 000 Kg	GRUMMAN - G1159		Business	None	Landing	IMC	No
5101350	United States	07/03/2005	2 251 to 5 700 Kg	AERO VODOCHODY - L39		Pleasure	Minor	Landing	IMC	Yes
5101360	United States	05/03/2005	2 251 to 5 700 Kg	PIPER - PA23 - 250		Pleasure	None	Landing	VMC	No
5101610	United States	03/01/2005	2 251 to 5 700 Kg	CESSNA - 441 - NO SERIES EXISTS		Pleasure	None		IMC	Yes
5102240	United States	12/01/2005	5 701 to 27 000 Kg	BEECH - 300		Business	None	Landing	IMC	No
5102370	United States	12/03/2005	2 251 to 5 700 Kg	NORTH AMERICAN (COMMANDER 500)		Pleasure	None	Landing	VMC	No
5102530	United States	04/01/2005	2 251 to 5 700 Kg	NORTH AMERICAN (COMMANDER 690/1685)		Business	None	Landing	VMC	
5103040	United States	06/04/2005	2 251 to 5 700 Kg	BRITTEN NORMAN - BN2A		Passenger	None	Landing	VMC	No
5103200	United States	03/04/2005	2 251 to 5 700 Kg	CESSNA - 310		Pleasure	None	Take-off	VMC	No
5103290	United States	26/04/2005	2 251 to 5 700 Kg	SWEARINGEN - SA226 - T		Business	Minor	Landing	IMC	Yes
5103590	United States	03/05/2005	2 251 to 5 700 Kg	PIPER - PA31T			None	Landing	VMC	No
5103860	United States	11/03/2005	2 251 to 5 700 Kg	AYRES (THRUSH COMMANDER)		Agricultural	None	Landing	VMC	Yes
8100520	United States	02/07/2008	2 251 to 5 700 Kg	CESSNA - 500 - CITATION (525B CITATION CJ3)		General Aviation	None	Landing	VMC	No
6003310	United States	19/07/2006	5 701 to 27 000 Kg	CESSNA - 560 - CITATION V		Business	Fatal	Landing		
6003380	United States	17/08/2006	5 701 to 27 000 Kg	FAIRCHILD (SA227 III)		Ferry/positioning	Minor	Landing	VMC	
9200177	United States	16/01/2009	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ		Pleasure	None	Landing	VMC	
9200279	United States	14/03/2009	2 251 to 5 700 Kg	PIPER - PA31P - 350		Cargo	None	Landing	VMC	
8200615	United States	16/05/2008	2 251 to 5 700 Kg	CESSNA - 421	Private owner	Pleasure	None	Landing	VMC	
8200662	United States	12/04/2008	5 701 to 27 000 Kg	EMBRAER - EMB110		Cargo	None	Landing	IMC	No
8200695	United States	19/04/2008	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ		Pleasure	None	Landing	VMC	
8200723	United States	22/05/2008	2 251 to 5 700 Kg	PILATUS - PC12		Pleasure	None	Landing	VMC	Yes
8200760	United States	01/06/2008	2 251 to 5 700 Kg	BEECH - 18 (18 (C-45))	Private owner	Pleasure	None	Landing	VMC	
8200931	United States	30/07/2008	2 251 to 5 700 Kg	OTHER (ECLIPSE 500(ECLIPSE AVIATION CORPORATION))		General Aviation	None	Landing	VMC	

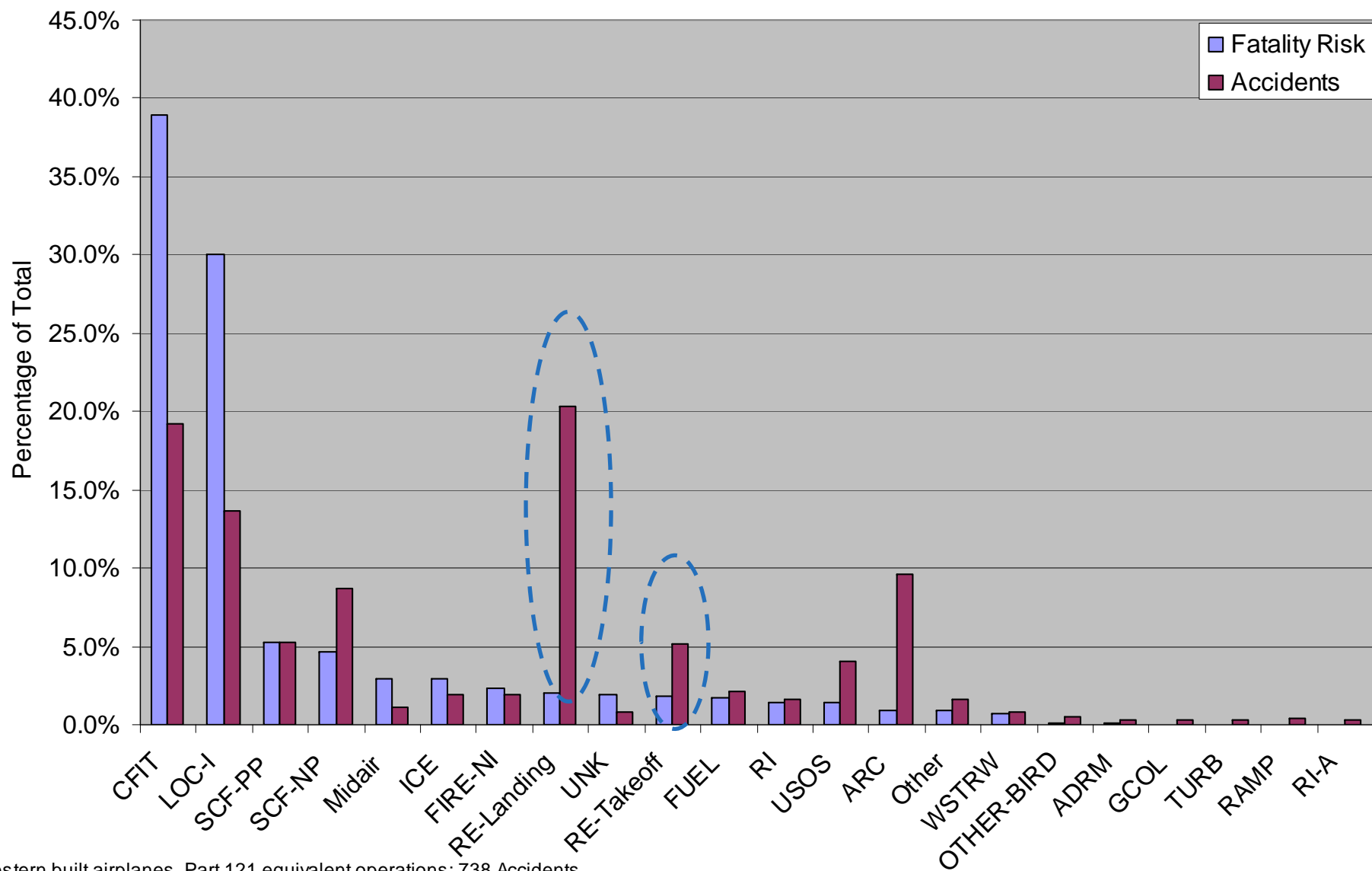
File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
8200978	United States	25/05/2008	2 251 to 5 700 Kg	AYRES (THRUSH COMMANDER)		Agricultural	None	Take-off	VMC	
7100444	United States	07/12/2007	2 251 to 5 700 Kg	PIAGGIO - P180 - AVANTI		Passenger	None	Landing		
7200020	United States	24/01/2007	5 701 to 27 000 Kg	CESSNA - 551 - CITATION II		Ferry/positioning	Serious	Landing	IMC	
7200066	United States	18/02/2007	5 701 to 27 000 Kg	EMBRAER - ERJ170		Passenger	None	Landing	IMC	Yes
7200097	United States	31/01/2007	2 251 to 5 700 Kg	CESSNA - 310		Business	None	Landing	VMC	
7200146	United States	17/03/2007	2 251 to 5 700 Kg	BEECH - G58		Pleasure	Fatal	Landing	VMC	
7200207	United States	26/04/2007	2 251 to 5 700 Kg	BEECH - 18 (18 (C-45))		Cargo	None	Landing	VMC	
7200209	United States	11/04/2007	2 251 to 5 700 Kg	SWEARINGEN - SA226 - TC		Business	None	Take-off	IMC	
7200269	United States	26/03/2007	5 701 to 27 000 Kg	LEARJET - 36		Business	None	Take-off	IMC	
7200317	United States	23/03/2007	5 701 to 27 000 Kg	DASSAULT - FALCON900		Ferry/positioning	None	Landing	VMC	
7200433	United States	05/05/2007	2 251 to 5 700 Kg	CESSNA - 414		Pleasure	None	Landing	VMC	
7200567	United States	10/06/2007	5 701 to 27 000 Kg	DASSAULT - FALCON900		Business	None	Take-off	VMC	
7201090	United States	10/09/2007	2 251 to 5 700 Kg	CESSNA - 402		Cargo	None	Landing	VMC	
7201323	United States	27/10/2007	5 701 to 27 000 Kg	CESSNA - 650 - CITATION III		Business	None	Landing	IMC	
7201327	United States	14/10/2007	5 701 to 27 000 Kg	ROCKWELL (SABRELINER 65)		Ferry/positioning	None	Landing	IMC	
7201370	United States	17/10/2007	5 701 to 27 000 Kg	LEARJET - 35		Business	None	Landing	IMC	
7201456	United States	22/09/2007	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ		Pleasure	None	Take-off	VMC	
7201692	United States	14/09/2007	5 701 to 27 000 Kg	OTHER (ASTRA SPX (1125SPX))(ISRAEL))		Business	Minor	Landing	IMC	
7201708	United States	02/12/2007	5 701 to 27 000 Kg	CESSNA - 551 - CITATION II		Business	None	Landing	VMC	Yes
7201774	United States	16/12/2007	5 701 to 27 000 Kg	CANADAIR - CL600 1A11 - 600 - 600		Passenger	None	Landing	IMC	
7201782	United States	19/11/2007	2 251 to 5 700 Kg	AYRES (THRUSH COMMANDER)		Agricultural	None	Landing	VMC	
5004680	United States	08/12/2005	27 001 to 272 000 Kg	BOEING - 737		Passenger	Fatal	Landing		
9100215	United States	29/03/2009	5 701 to 27 000 Kg	CESSNA - 551 - CITATION II		Business	None	Landing	VMC	No
6001050	United States	24/01/2006	5 701 to 27 000 Kg	CESSNA - 560 - CITATION V		Business	Fatal	Landing	VMC	
8100675	United States	01/09/2008	5 701 to 27 000 Kg	CESSNA - 560 - CITATION V		Ferry/positioning	None	Landing	VMC	Yes
8100714	United States	20/12/2008	27 001 to 272 000 Kg	BOEING - 737		Passenger	Serious	Take-off	VMC	Unknown
8100730	United States	25/09/2008	2 251 to 5 700 Kg	BEECH - 200		General Aviation	None	Landing		
6004620	United States	05/01/2006	2 251 to 5 700 Kg	BEECH - 100		Passenger	None	Landing	IMC	

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
8100738	United States	29/10/2008	2 251 to 5 700 Kg	CESSNA - 421	Corporate/executive	Business	None	Approach	VMC	No
8100751	United States	23/12/2008	5 701 to 27 000 Kg	RAYTHEON (PREMIERE I)	Corporate/executive	Business	None	Landing	VMC	
8100773	United States	20/08/2008	2 251 to 5 700 Kg	CESSNA - 441 - NO SERIES EXISTS	Corporate/executive	Business	None	Take-off	VMC	
8100787	United States	18/06/2008	2 251 to 5 700 Kg	BEECH - 100		Business	None	Landing		No
8100825	United States	21/12/2008	5 701 to 27 000 Kg	DASSAULT - MYSTERE FALCON20		Cargo	None	Landing	IMC	
8200086	United States	22/02/2008	5 701 to 27 000 Kg	RAYTHEON (1900)	Corporate/executive	Business	Serious	Landing	IMC	Yes
9100751	United States	15/09/2009	2 251 to 5 700 Kg	LEARJET - 36		Unknown	None	Landing		
8002070	United States	19/09/2008	5 701 to 27 000 Kg	LEARJET - 60		Passenger	Fatal	Take-off	VMC	
8200124	United States	12/02/2008	5 701 to 27 000 Kg	RAYTHEON (PREMIERE I)	Corporate/executive	Business	None	Landing	VMC	No
8200201	United States	13/03/2008	2 251 to 5 700 Kg	AIR TRACTOR - AT602 - NO SERIES EXISTS	Sales/rental/service	Agricultural	None	Landing	VMC	No
8200209	United States	16/01/2008	2 251 to 5 700 Kg	BEECH - G58		Business	None	Landing	VMC	Yes
8200233	United States	05/02/2008	5 701 to 27 000 Kg	SWEARINGEN (MERLIN IV A)		Cargo	None	Take-off	IMC	
8200261	United States	03/04/2008	5 701 to 27 000 Kg	CESSNA - 750 - NO SERIES EXISTS		Ferry/positioning	None	Landing	VMC	No
8200308	United States	19/04/2008	2 251 to 5 700 Kg	CESSNA - 500 - CITATION (CITATION MUSTANG)	Corporate/executive	Pleasure	None	Landing	VMC	No
8200367	United States	20/03/2008	2 251 to 5 700 Kg	BEECH - 90 (90 KING AIR)		Pleasure	None		VMC	
8200387	United States	24/04/2008	2 251 to 5 700 Kg	CESSNA - 421		Passenger	None	Landing	VMC	Yes
8200436	United States	30/04/2008	5 701 to 27 000 Kg	CESSNA - 560 - CITATION V	Corporate/executive	Business	None	Landing	VMC	Yes
9100018	United States	06/01/2009	2 251 to 5 700 Kg	BEECH - 100		Business	None	Landing		
9100074	United States	04/02/2009	5 701 to 27 000 Kg	OTHER (DC-3-65TP (CARGOMASTER)(AERO MODIFICATIONS INT))		Flight Training/Instructional	None	Take-off	VMC	No
9201099	United States	11/07/2009	2 251 to 5 700 Kg	NORTH AMERICAN (COMMANDER 680 SUPERAERO)		Pleasure	None	Take-off	VMC	
9201104	United States	24/07/2009	2 251 to 5 700 Kg	BEECH - 18 (18 (C-45))		Pleasure	None	Landing	VMC	
9201232	United States	09/08/2009	2 251 to 5 700 Kg	AYRES - S2R600 - T660		Agricultural	Minor	Landing	VMC	
9201382	United States	21/10/2009	2 251 to 5 700 Kg	NORTH AMERICAN (COMMANDER 690/1685)		Ferry/positioning	None	Landing	VMC	
9201542	United States	08/11/2009	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ		Pleasure	None	Landing	VMC	
9201670	United States	25/06/2009	2 251 to 5 700 Kg	PIPER - PA31T - 1		Pleasure	None		VMC	
9201697	United States	22/12/2009	2 251 to 5 700 Kg	CESSNA - 402		Cargo	None	Take-off	IMC	
9200536	United States	15/05/2009	2 251 to 5 700 Kg	AIR TRACTOR - AT602 - NO SERIES EXISTS		Agricultural	Serious	Take-off	VMC	

File number	State/area of occurrence	Local date	Mass group	Make/mdl/srs	Operator type	Operation type	Injury level	Flight phase	Weather conditions	Weather relevant
9200564	United States	12/06/2009	2 251 to 5 700 Kg	PILATUS - PC12		Business	None	Landing	IMC	
9200571	United States	08/06/2009	2 251 to 5 700 Kg	YAKOVLEV - YAK11		Test/experimental	None	Landing	VMC	
9200685	United States	19/06/2009	2 251 to 5 700 Kg	NORTH AMERICAN - SNJ		Pleasure	None	Landing	VMC	
9200738	United States	23/05/2009	2 251 to 5 700 Kg	AYRES - S2R600 - T660		Agricultural	None	Take-off	VMC	
9200863	United States	13/07/2009	2 251 to 5 700 Kg	BEECH - 18 (18 (C-45))		Cargo	None	Landing	VMC	
016/2012	Venezuela	11/04/2012	2 251 to 5 700 Kg	BEECH - G58	Private owner	Business	None	Landing		
014/2012	Venezuela	29/03/2012	2 251 to 5 700 Kg	PIPER - PA23	Private owner	Local	None	Landing		
8100490	Venezuela	16/10/2008	27 001 to 272 000 Kg	BOEING - 737 - 200		Passenger	None	Landing	VMC	No
7004070	Venezuela	17/02/2007	0-2 250 Kg	OTHER (CESSNA 172)	Private owner	Cross-country	None	Landing	VMC	
7004170	Venezuela	18/03/2007	0-2 250 Kg	CESSNA - 185	Private owner	Cross-country	None	Take-off	VMC	
7004360	Venezuela	16/07/2007	0-2 250 Kg	PIPER - PA38	Flying club/school	Dual	None	Take-off	VMC	
7004380	Venezuela	04/08/2007	0-2 250 Kg	CESSNA - 185	Sales/rental/service	Air taxi	None	Landing	Unknown	
7004520	Venezuela	25/10/2007	0-2 250 Kg	CESSNA - 182	Private owner	Cross-country	None	Landing	VMC	
9100227	Venezuela	17/04/2009	2 251 to 5 700 Kg	CESSNA - 208		Passenger	Fatal	Take-off		
9100280	Venezuela	15/02/2009	2 251 to 5 700 Kg	CESSNA - 208		Passenger	None	Landing		No
005/2012	Venezuela	05/01/2012	2 251 to 5 700 Kg	OTHER (MIELEC-PEZETEL AN2)	Private owner	Business	None	Landing		

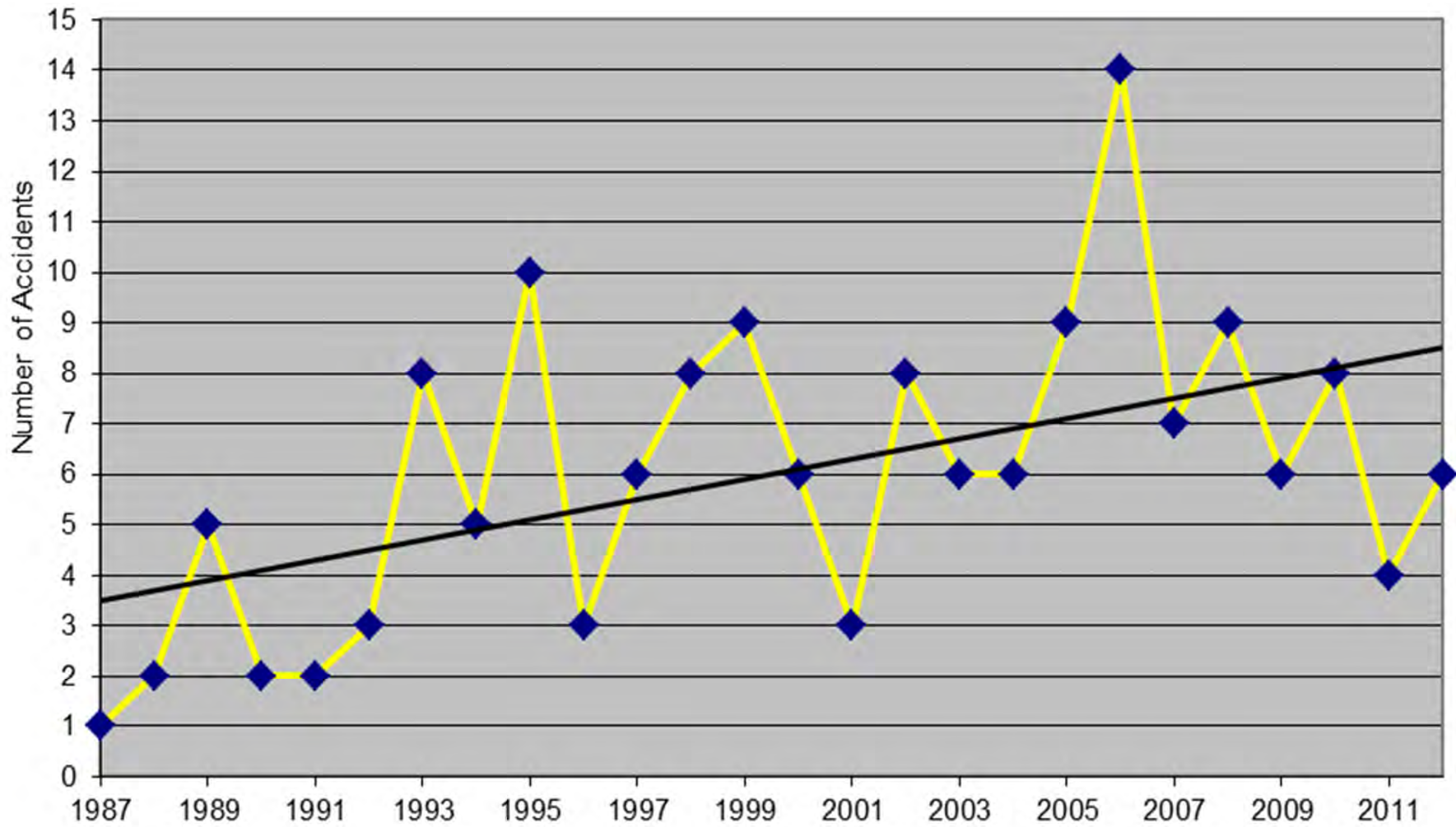
***Runway Excursion Accident History  
Trends and Causal Factors***

### 1987-2011 World Wide Hull Loss and Fatal Accidents\*



\*Western built airplanes, Part 121 equivalent operations; 738 Accidents

## RE-Landing - World Wide Hull Loss and Fatal Accidents



\*Western built airplanes, Part 121 equivalent operations



# Landing Overrun Characteristics – Boeing Study

*Stability*

*“Floating“*

*Configuration*

Unstable Approach  
*(Too High, Too Fast)*

Tailwind

Long-Landing  
(Flare and/or Unstable –high –fast)

Speedbrakes late / not deployed  
AB too low

Reversers late / Not deployed

High touchdown speed

Shorter Runways

Friction limited - Wet / contamination

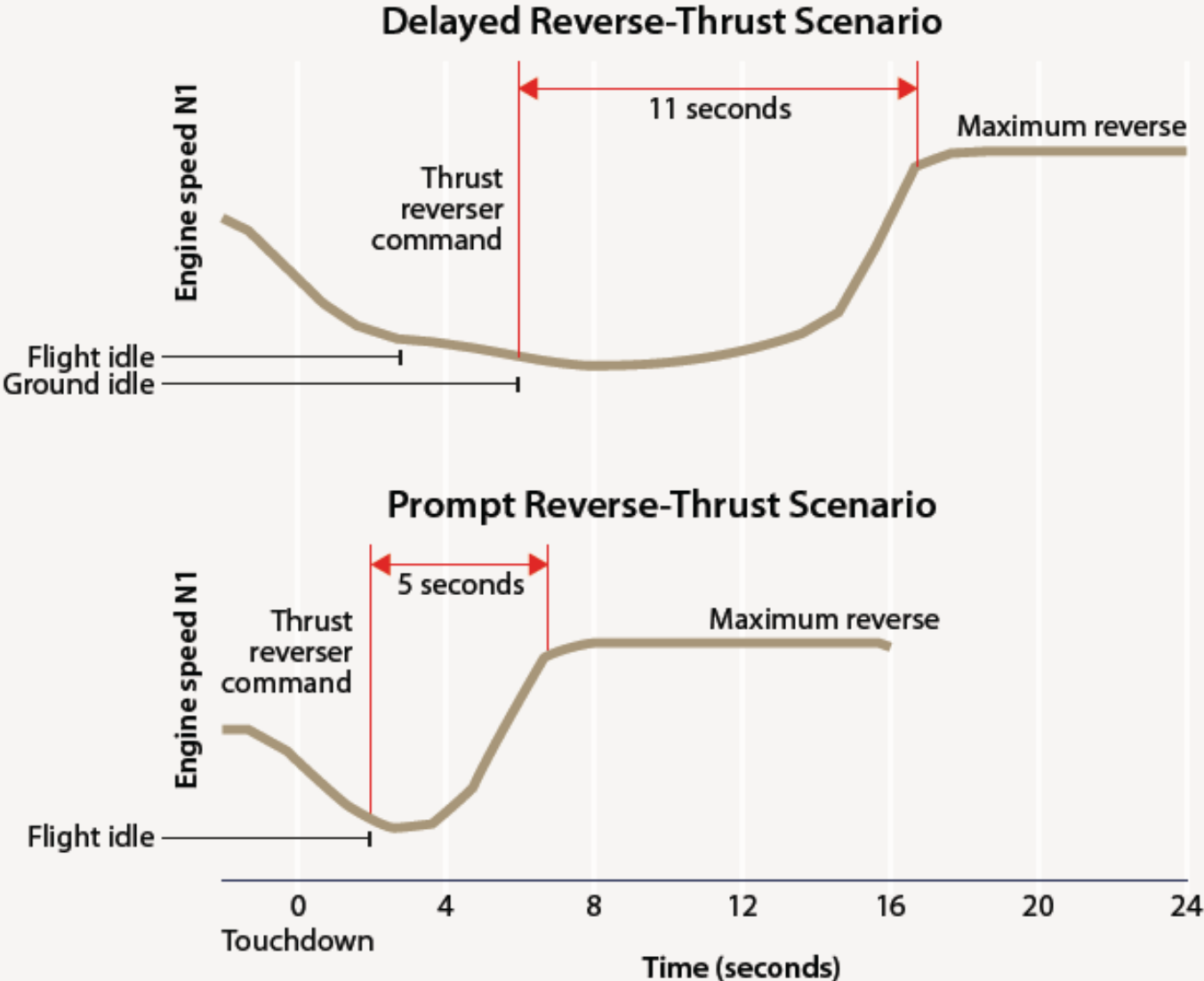
Reverser level too low / Reduced too soon

Overruns often are caused by more than one factor!

Source: FDR data sent to Boeing Aero Safety, 2003-present, Models: Boeing Puget Sound

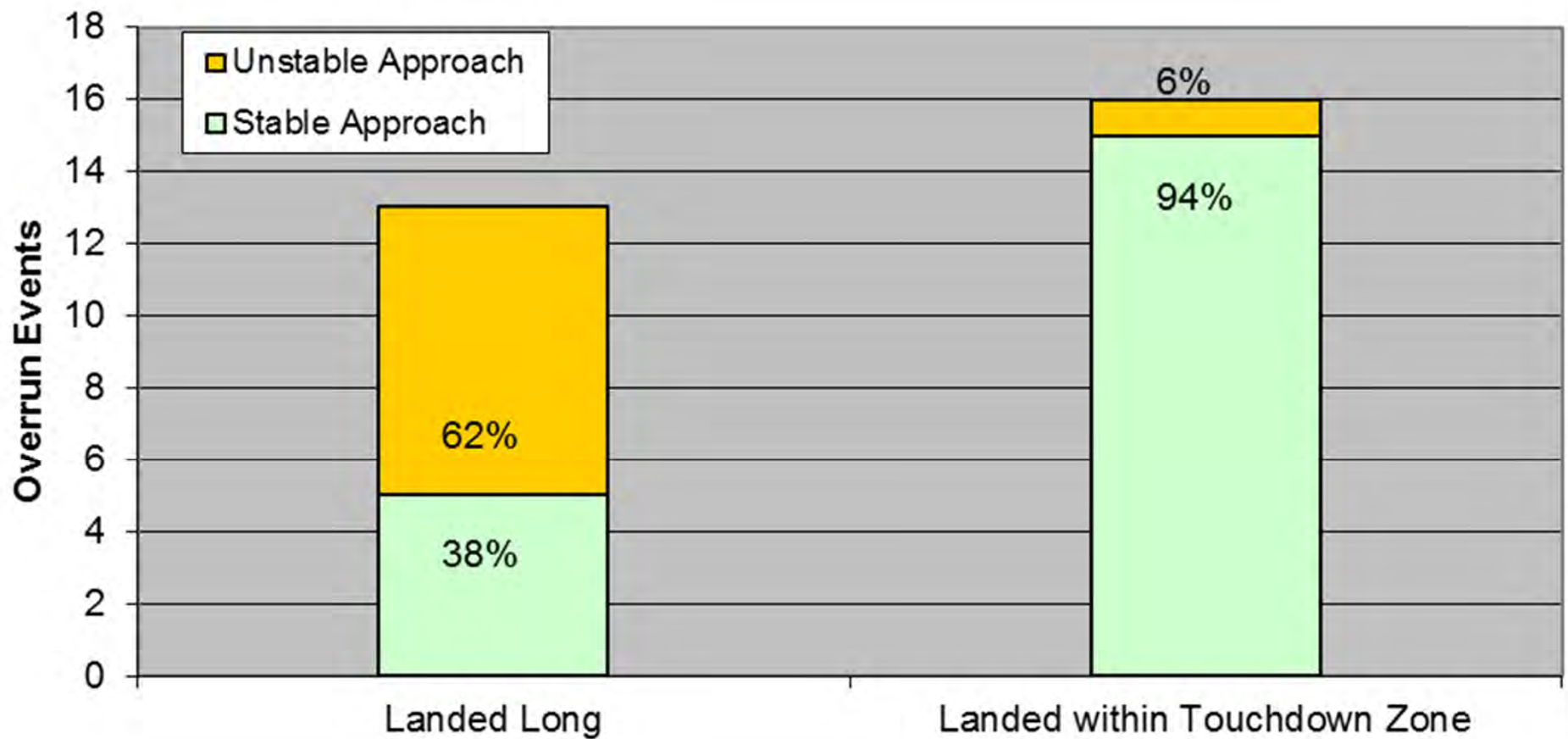
*Pre-decisional information subject to limitations of used under 14 CFR 193. For CAST use only – not for distribution*

# Inadequate Deceleration — Delayed Thrust Reverser Use

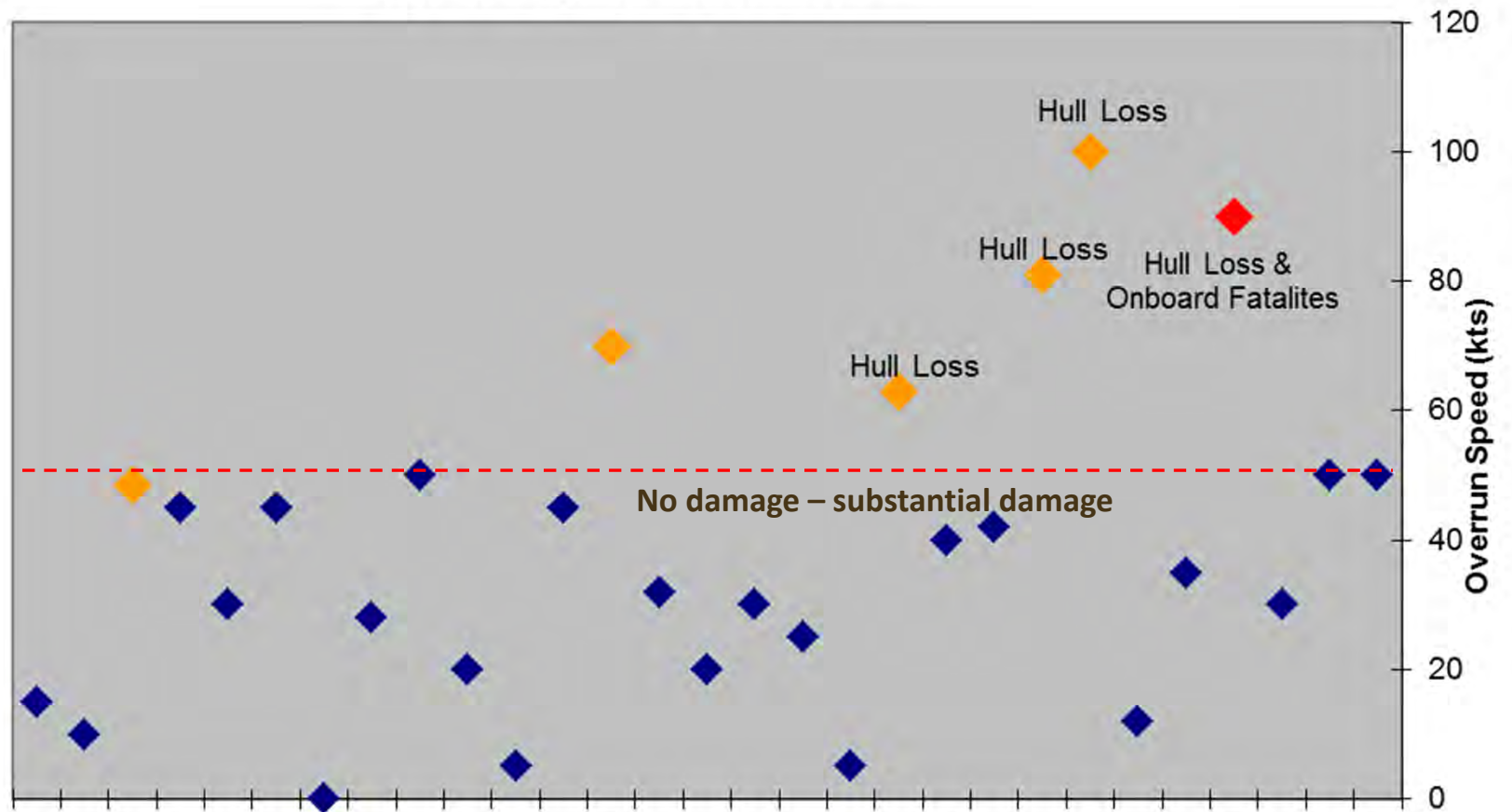


## 29 Boeing Jet Overrun Accidents and Incidents

### Correlation of Stabilized Approach vs Landing Location



## Overrun Speed vs Outcome



# Landing Excursion Mitigation – Part 121 Fleet

Overall Awareness of RE RISK in Policies and Procedures  
(Regulators, ANSP, Airports, Operators, Manufacturers)

Assessment of the airplane's landing performance

Enhance Approach and Landing Stability: (Published approach, ATC, Crew, Airplane Systems)

Timely and accurate field condition reports (winds and runway surface conditions)

Enhance Crews Situational Awareness of Airplane Position and Stopping Performance on Runway – PAPI/VASI, Runway lighting, Touchdown zone, Signage

Crews knowledge and skill in use of airplane stopping devices

**Airplane systems** that enhance the flight crews ability to land and stop the airplane: (e.g. flare guidance, deceleration guidance, system call outs, visual features that enhance the crews situational awareness of the airplanes position on the runway; Systems that quantify braking performance on slippery runways.



Field Maintenance and Reporting, RSA

## APPENDIX C

## RECOMMENDED ACTIONS TO PREVENT / MITIGATE RUNWAY EXCURSIONS

## GROUP 1

Recommended Actions	Impact	Feasibility	Indicator	Priority
1. Develop criteria to determine a stabilized approach for the CAR & SAM Regions *	Considerable	Moderate	P2	1
2. CAA requirement that the operational manual for each operator includes a policy for * <ul style="list-style-type: none"> <li>• Stabilized approach</li> <li>• Braking procedures for special cases such as aerodromes located at high altitude, high temperatures, contaminated runways or other special conditions that so require.</li> </ul>	Considerable	Difficult	P3	2
3. Runway Safety Teams (RST) implementation in the Regional International Airports.	Considerable	Difficult	P3	3
4. Advertising Campaign for the improvement of stabilized approaches for small aircraft operators / general aviation	Moderate	Little	P4	4
5. Pilot's training on human factors in aspects such as perception that may be compromised in flight due to stress, fatigue, time pressure, etc. (in person or virtual)*	Moderate	Moderate	P5	5
6. Training on human factors and aircraft performance for air traffic controllers to identify unstabilized approach situations, mainly operational implications of tail winds, contaminated runway, etc. and contact pilots if lack of situational awareness for inadequate braking are obvious*	Moderate	Moderate	P5	6

Recommended Actions	Impact	Feasibility	Indicator	Priority
7. Implementation of vertical signals in small airfields, signs should be frangible and located towards the end of the runway, to assist the pilot in anticipating whether the runway length will allow a complete braking.	Moderate	Difficult	P6	7

\*Recommend its inclusion in LAR 91, 121, y 135 and other related documents

**GROUP 2**

Recommended Actions	Impact	Feasibility	Indicator	Priority
1. Adherence to Standard Operational Procedures (SOP)	Considerable	Little	P1	4
2. Compliance to MVA Certificate Performance and Operations Limitations	Considerable	Little	P1	3
3. Raise awareness about the need and proper performance of "Go Around"	Considerable	Difficult	P3	7
4. Aerodrome conditions Assessment and Analysis (Runway, Category, lights, marks, etc.)	Considerable	Little	P1	8
5. Concentration to avoid relax previous to operation conclusion. (fatigue)	Moderate	Little	P4	9
6. Air Traffic Management: provide necessary services to achieve stabilized approaches and provide timely RE risk information (Descending speed, runway selection, runway change, etc.)	Moderate	Difficult	P6	5
7. Runway design, status and maintenance (Annex 14): remaining runway marking, approach lighting, friction coefficient, etc.	Moderate	Moderate	P5	6



Recommended Actions	Impact	Feasibility	Indicator	Priority
8. Improve automatic systems “Go Around” ROPS (Runway Overrun Prevention Systems)	Moderate	Difficult	P6	10
9. Briefing previous to descent, preparation and planning in case of “Go Around”.	Considerable	Little	P1	2
10. Recollect data of each RE through a survey where CAA indicate the contributing factors to the RE that occurred in their States, and share the results	Considerable	Moderate	P2	1

**GROUP 3**

<b>Recommended Actions</b>
1. SOPs: effective use of stopping devices
2. Training for controllers
3. PBN (RNAV-RNP) at airports with high number of unstable approaches
4. Runway grooving, Maintenance
5. Unstabilized Approach training/ policies
6. Develop new Runway Excursion prevention event definitions/measurements for FDX/ASIAS (Runway left, top of descent, long landing, etc.)
7. Training on AC performance to pilots and controllers
8. Support manufacturers of technological systems to prevent runway excursions (not only a Airbus).