Aviation Industry Safety Update

Intelligence, Safety and Risk Analysis Unit

1 January 2014 to 31 December 2014

CIVIL AVIATION AUTHORITY
OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

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Introduction and Executive Summary

Introduction

This safety report is produced using data from the Civil Aviation Authority Management Information System. It primarily covers the period from 1 January 2014 to 31 December 2014.[1]

Key Indicators

- Most of the key indicators of industry activity such as numbers of aircraft, air transport flights, seat hours and total hours flown have **decreased**.
    - Aircraft on the Register increased by 1.2%
    - Air transport flights have remained constant at approx. 467,000 (excluding 130,000 thousand Part 115 flights, of which approximately 60% were parachute jumps),
    - Seat hours decreased by 4% and,
    - Total hours flown decreased by 1.3%.
- The number of organisational certificates has decreased again by 3.8 % to 927.
- The number of aircraft movements at principal aerodromes has continued to decrease, down 3.6% in this period and the trend over three years reflects a downward trend in number of air transport flights from principal aerodromes.
- The number of accidents in the period was 111, down from 115 in 2013, and the trend is slightly up relative to the average of the three previous years (100 accidents pa).
- There were 12 fatalities, more than the 7 in the previous 12 months but an improvement on the average of the three previous years (15.7 fatalities pa).
- In contrast to the fatalities, the number of serious injuries has increased from 24 to 42.
- The Airline Operations – Helicopters sector continues to grow, though it is likely that existing operations are expanding rather than new certificate holders entering the industry (1 less Part 135 certificate active in 2014).
- The size of the helicopter fleet increased from 795 in 2013 to 831 in 2014.
- The number of airline helicopter flights increased slightly from 39,399 in 2013 to 40,123 in 2014. (see page 26)
- The number of total seat hours increased for Airline Operations – Helicopters. From 120,000 seat hours Dec 2013 up to 150,000 seat hours. Dec 2014. This was the only sector to have an increase in seat hours. (see page 30)
- The Airline Operations– Helicopter sector has experienced a significant and sustained increase in social cost per seat hour. (see page 43)

J.D. Stanton
Manager Intelligence Safety and Risk Analysis

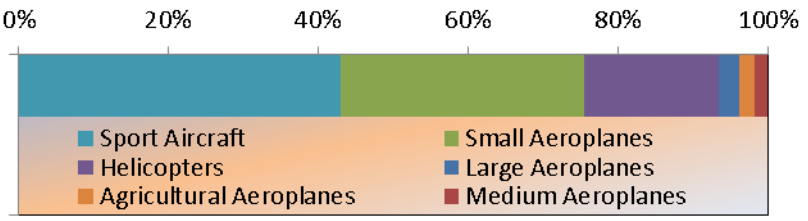
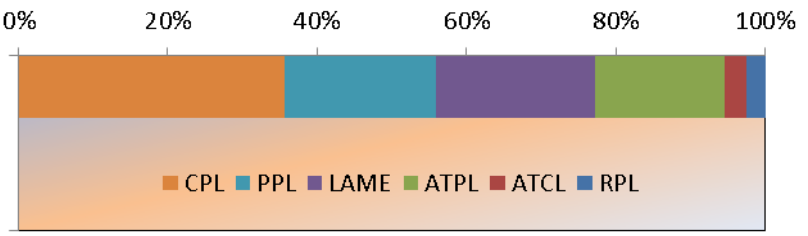
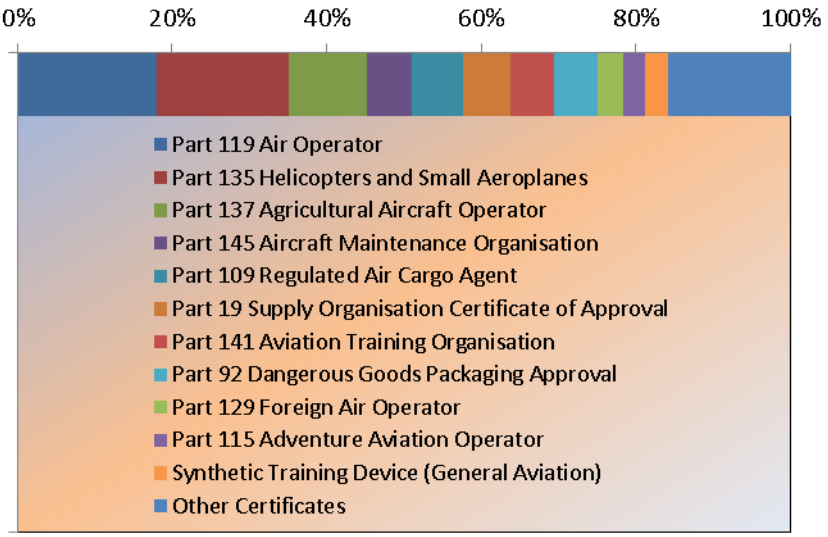
[1] This report uses calendar years. Where quarters are referred to the first quarter is 1 January to 31 March.
Data in tables may not sum exactly to the total shown due to rounding

Executive Summary - Status as at 31 December 2014

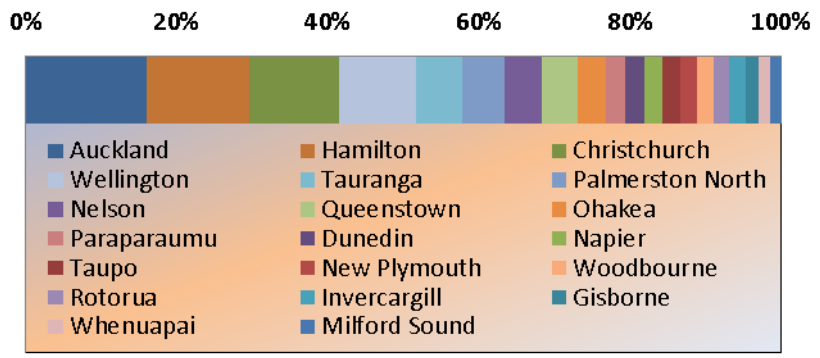
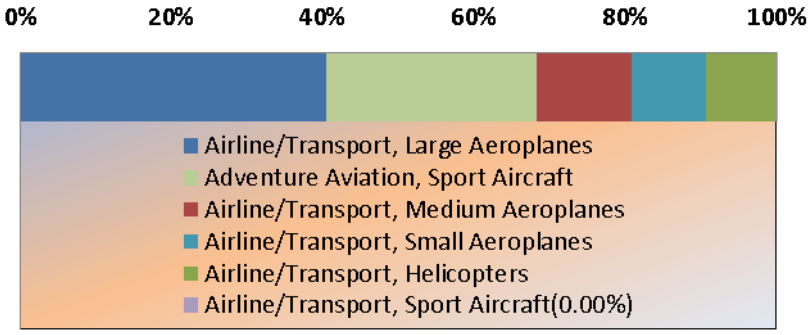
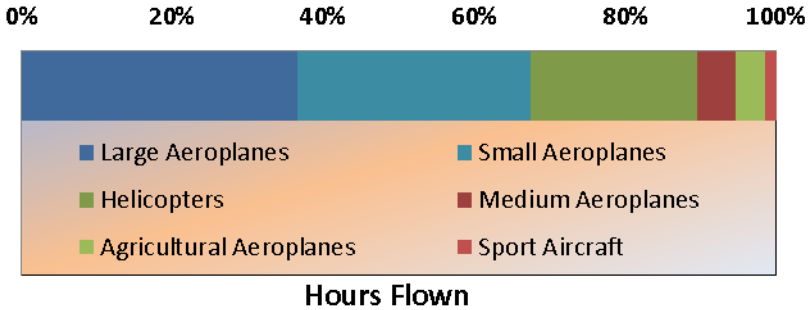
This section is organised into three parts: Industry Size, Industry Activity and Safety Outcomes

Part 1 - Industry Size

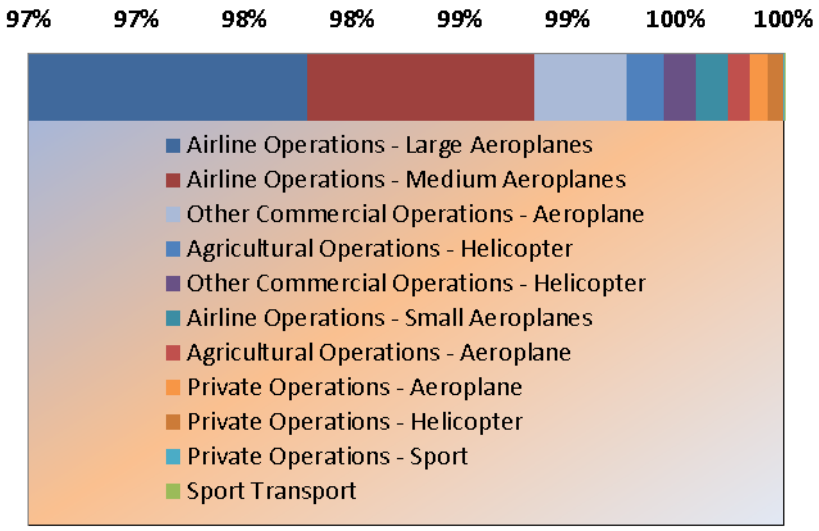
(See here for more information)

Measure	*Current Contributors*
Registered Aircraft as at 31 Dec 2014 4,615 as at 31 Dec 2013 4,562 31 Dec average for 2010, 2011 & 2012 4,507.3	
Licences on Issue as at 31 Dec 2014 12,833 as at 31 Dec 2013 13,231 31 Dec average for 2010, 2011 & 2012 13,346.0	
Certificates Current as as at 30 Jun 2014 927 as at 30 Jun 2013 964 30 Jun average for 2010, 1011 & 012 954.3	

Part 2 - Industry Activity – Movements, Flights, Hours
(See here for more information)

Measure	*Current Contributors*
Aircraft Movements at Aerodromes Jan 2014 to Dec 2014 950,406 Jan 2012 to Dec 2013 986,581 Annual average Jan 2010 to Dec 2012 1,037,533.67	 **Aircraft Movements from Aerodromes** **Year ending Dec 2014, Percentages by Aerodrome**
Air Transport Flights (Thousands) Jan 2014 to Dec 2014 467 (includes 130,000 Part 115 flights of which approximately 60% were parachute jumps) Jan 2013 to Dec 2013 467 (includes 124,000 Part 115 flights of which approximately 64% were parachute jumps) Annual average Jan 2010 to Dec 2012 382	 **Air Transport Flights** **Year ending Dec 2014** **Percentages by Operation Type**
Hours Flown (all operations) (Thousands) Jan 2014 to Dec 2014 910 Jan 2013 to Dec 2013 932 Annual average Jan 2010 to Dec 2012 930.0	 **Hours Flown** **Year ending Dec 2014** **Percentages by Aircraft Type**

Part 2 - Industry Activity – Seat-Hours
(See here for more information)

Measure	***Current Contributors***
Seat-Hours (Millions) Jan 2014 to Dec 2014 49 Jan 2013 to Dec 2013 51 Annual average Jan 2010 to Dec 2012 49	 **Seat Hours Occupied for year ending Dec 2014** **Percentages by Safety Outcome Target Group** (Note the False Zero on the percentage scale, The Airline Operations – Large Aeroplanes group contributes 96.5% to the seat-hour total)

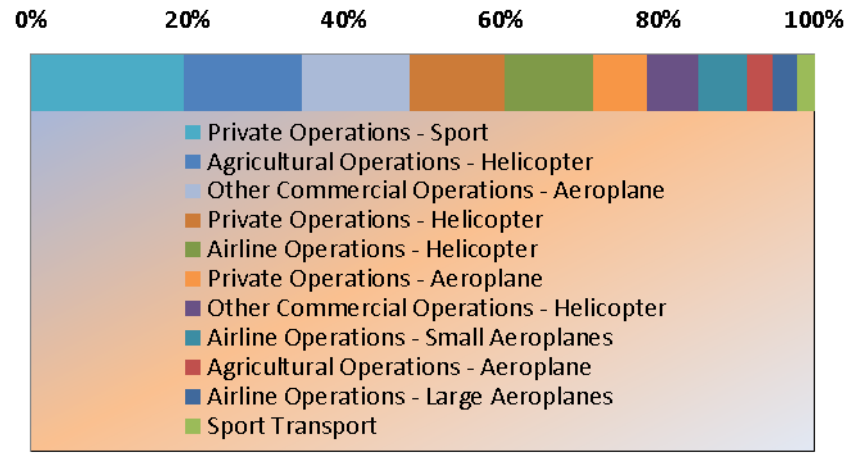
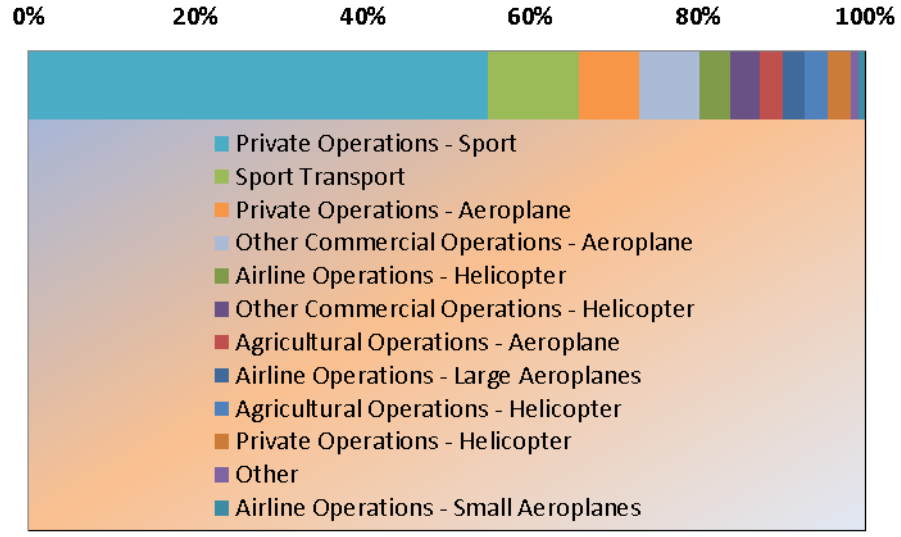
Hours and flights data is estimated because significant numbers of aircraft owners fail to comply with Rule Part 12.151 which requires owners to report this data either quarterly or annually. The return rate for 2014 has improved relative to previous years as follows:

Reporting Period	Percentage of expected returns received
3 years to 31 December 2012	55%
1 year to 31 December 2013	49%
1 year to 31 December 2014	57%

The major contribution to the shortfall of data in the current period comes from the Small Aeroplanes category. This category makes up approximately a third of the entire aircraft register, is estimated to contribute 31% of all the hours flown and achieves a return rate of only 53% see page 29

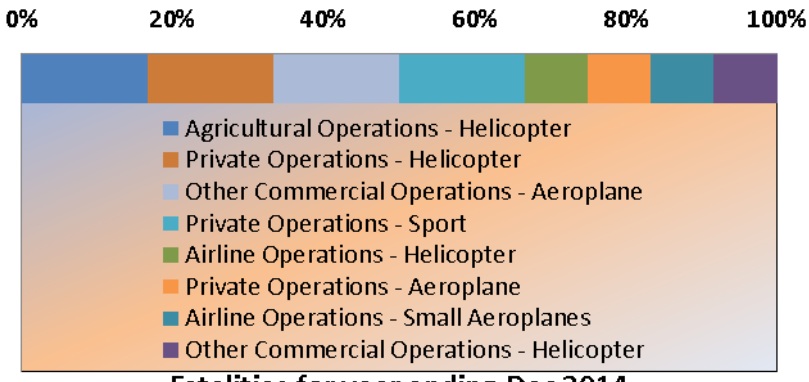
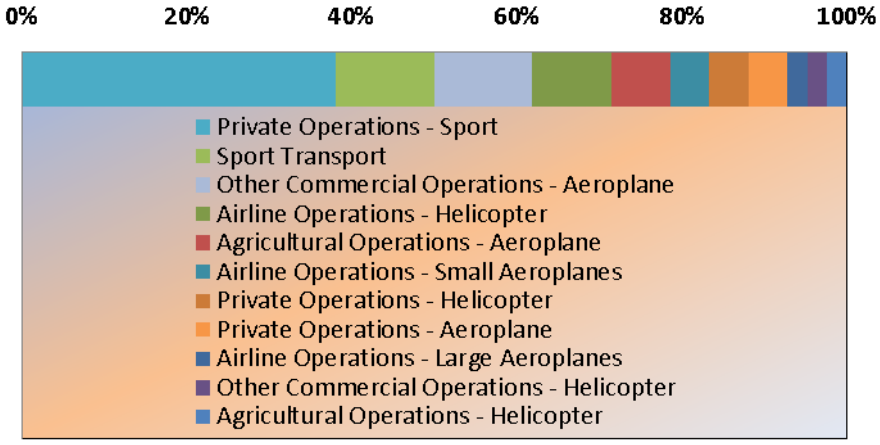
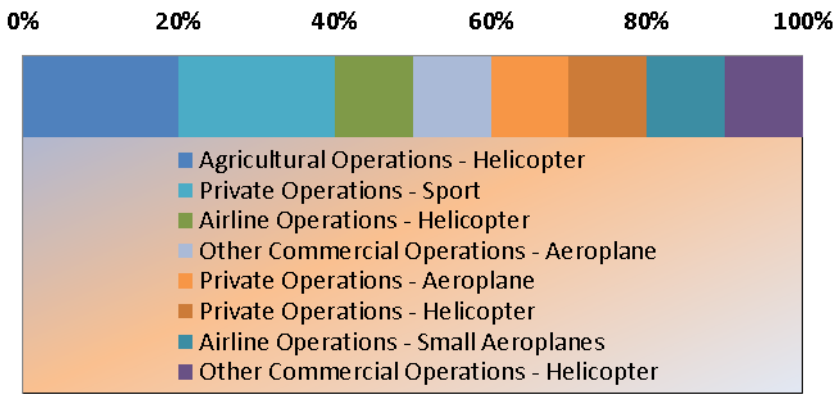
Part 3 - Safety Outcomes – Social Cost, Accidents

(See here for more information)

Measure	***Current Contributors***
Social Cost (2014 dollars) Jan 2014 to Dec 2014 $M 78 Jan 2013 to Dec 2013 $M 47 Annual average Jan 2010 to Dec 2012 $M 77	 **Social Cost for year ending Dec 2014** **Percentages by Safety Outcome Target Group**
Accidents Jan 2014 to Dec 2014 111 Jan 2013 to Dec 2013 115 Annual average Jan 2010 to Dec 2012 99.7	 **Accidents for year ending Dec 2014** **Percentages by Safety Outcome Target Group**

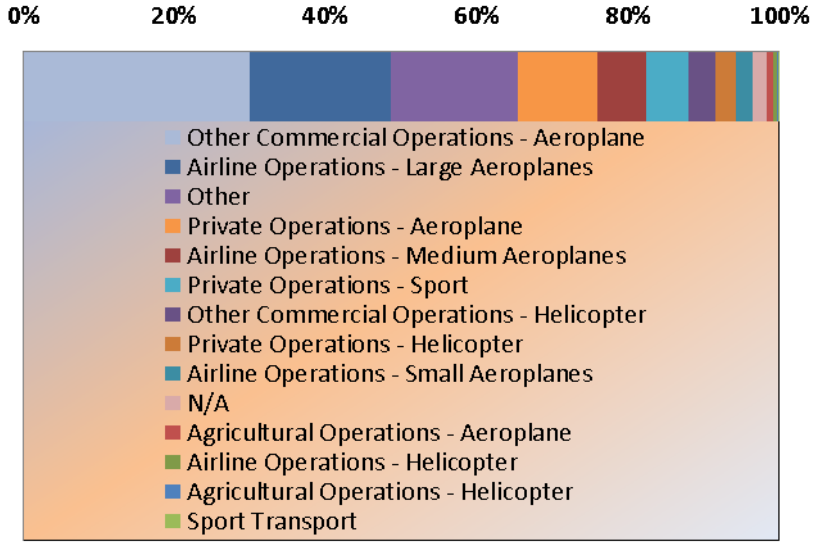
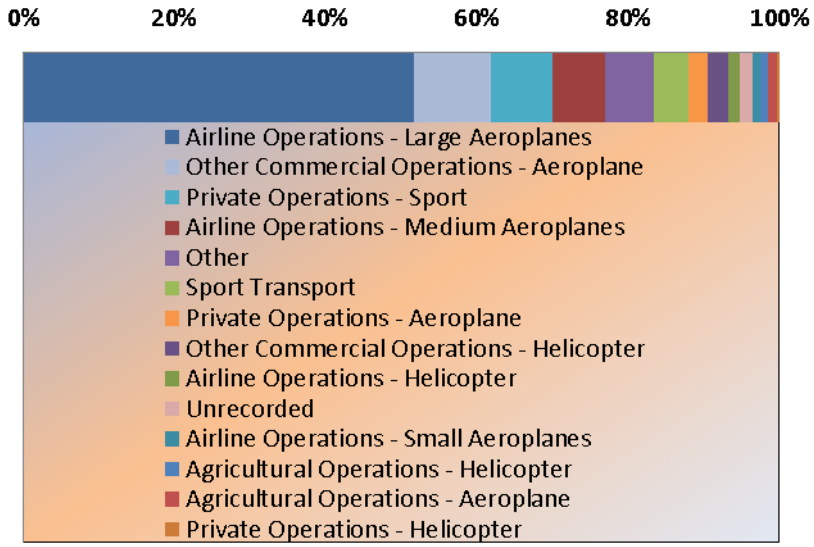
Part 3 - Safety Outcomes – Fatalities, Serious Injuries, Fatal Accidents

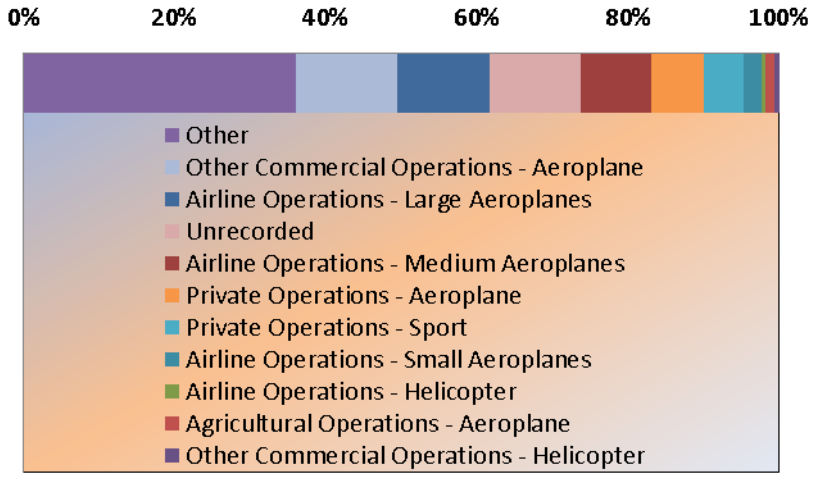
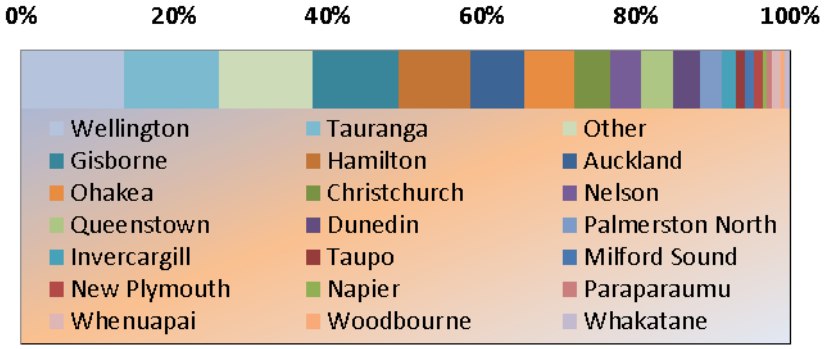
(See here for more information)

Measure	*Current Contributors*
Fatalities Jan 2014 to Dec 2014 12 Jan 2013 to Dec 2013 7 Annual average Jan 2010 to Dec 2012 15.7	 Fatalities for year ending Dec 2014 Percentages by Safety Outcome Target Group
Serious Injuries Jan 2014 to Dec 2014 42 Jan 2013 to Dec 2013 24 Annual average Jan 2010 to Dec 2012 18.3	 Serious Injuries for year ending Dec 2014 Percentages by Safety Outcome Target Group
Fatal Accidents Jan 2013 to Dec 2014 10 Jan 2012 to Dec 2013 5 Annual average Jan 2009 to Dec 2012 7.7	 Fatal Accidents for year ending Dec 2014 Percentages by Safety Outcome Target Group

Part 3 - Safety Outcomes – Airspace & Operational Incidents

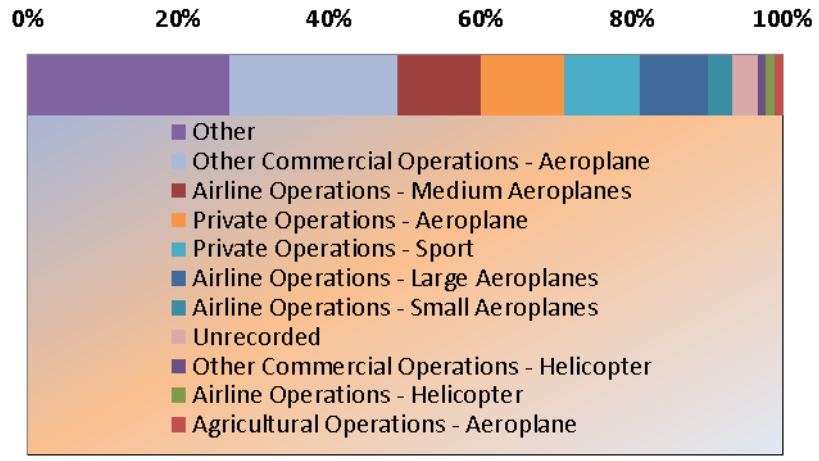
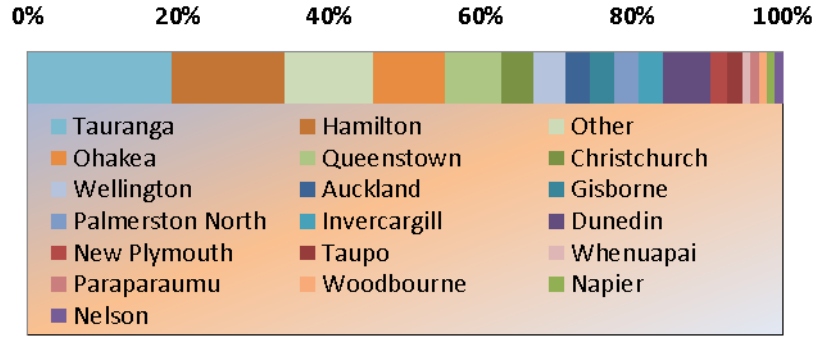
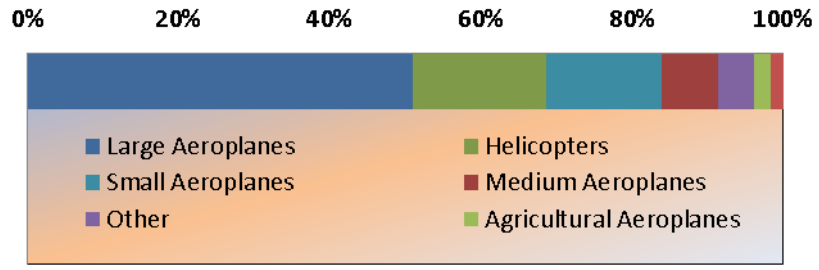
(See here for more information)

Measure	***Current Contributors***
Airspace Incidents Reported Jan 2014 to Dec 2014 1414 (6 Critical) Jan 2013 to Dec 2013 1437 (16 Critical) Annual average Jan 2010 to Dec 2012 1041.0 (15.7 Critical)	 **Airspace Incidents for year ending Dec 2014** **Percentages by Safety Outcome Target Group**
Operational Incidents Reported Jan 2014 to Dec 2014 735 (7 Critical) Jan 2013 to Dec 2013 .805 (11 Critical) Annual average Jan 2010 to Dec 2012 720.0 (5.0 Critical)	 **Operational Incidents for year ending Dec 2014** **Percentages by Safety Outcome Target Group**

Part 3 - Safety Outcomes – Aerodrome Incidents (See here for more information)	
Measure	***Current Contributors***
Aerodrome Incidents Reported Jan 2014 to Dec 2014 172 (0 Critical) Jan 2013 to Dec 2013 223 (2 Critical) Annual average Jan 2010 to Dec 2012 163.7 (1.3 Critical)	 **Aerodrome Incidents for year ending Dec 2014** **Percentages by Safety Outcome Target Group**  **Aerodrome Incidents for year ending Dec 2014** **Percentages by Nearest Reporting Point**

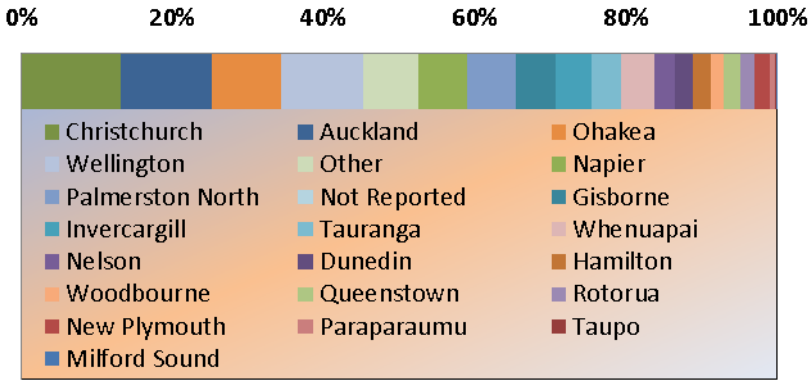
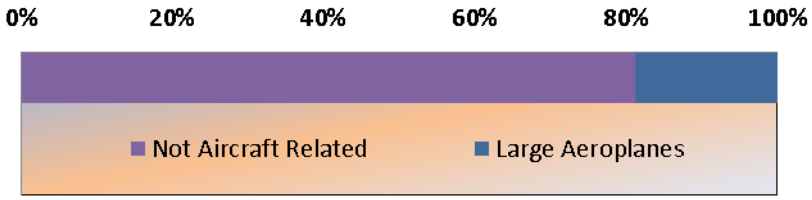
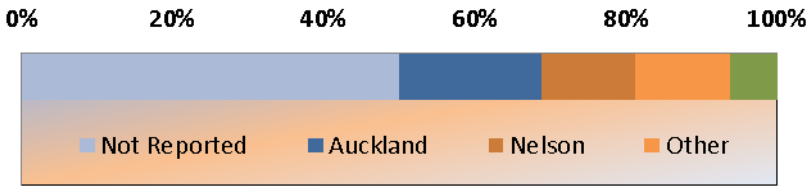
Part 3 - Safety Outcomes – Runway Incursions and Defect Incidents

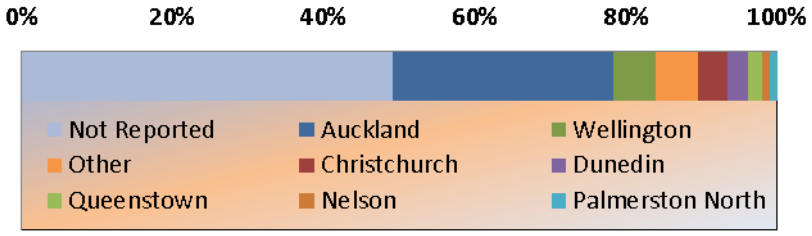
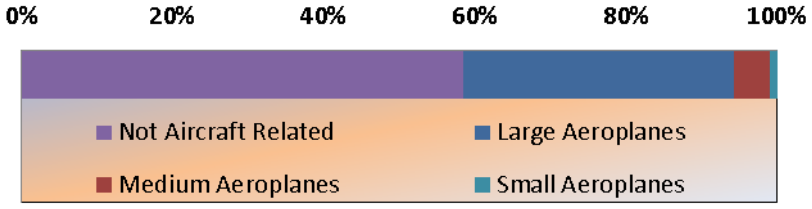
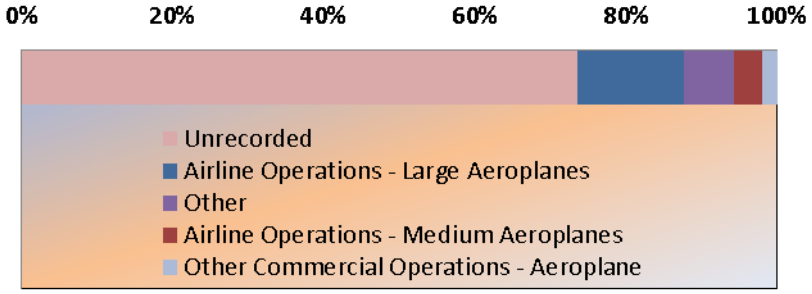
(See here for more information)

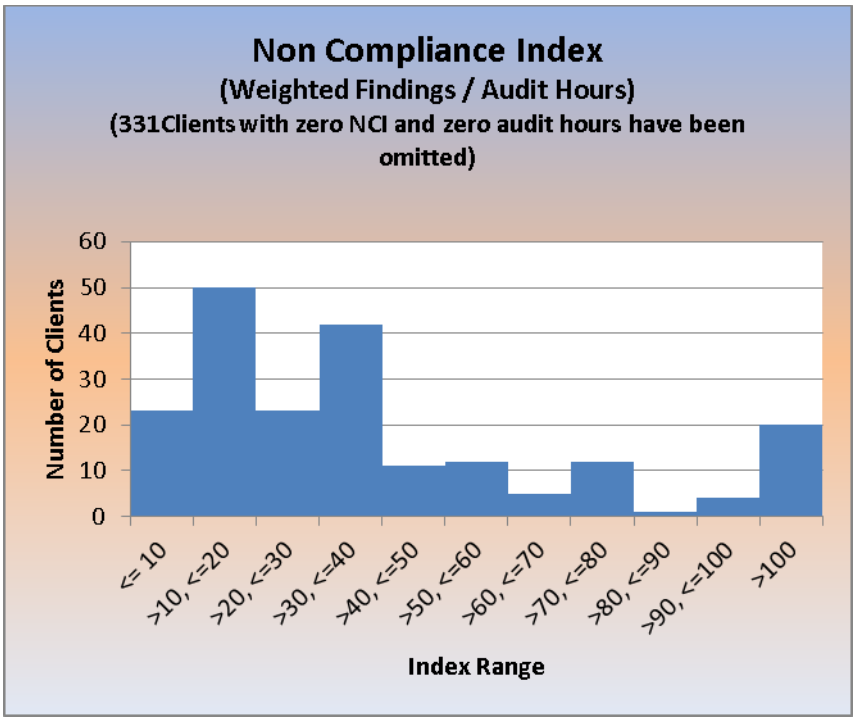
Measure	***Current Contributors***
Runway Incursions Reported Jan 2014 to Dec 2014 90 (0 Critical) Jan 2013 to Dec 2013 149 (2 Critical) Annual average Jan 2010 to Dec 2012 102.7 (1.0 Critical)	 **Runway Incursions for year ending Dec 2014** **Percentages by Safety Outcome Target Group**  **Runway Incursions for year ending Dec 2014** **Percentages by Nearest Reporting Point**
Defect Incidents Reported Jan 2014 to Dec 2014 1516 (2 Critical) Jan 2013 to Dec 2013 1831 (1 Critical) Annual average Jan 2010 to Dec 2012 1430.7 (3.0 Critical)	 **Defect Incidents for year ending Dec 2014** **Percentages by Aircraft Type**

Part 3 - Safety Outcomes – Bird Hazard Incidents, Security Incidents

(See here for more information)

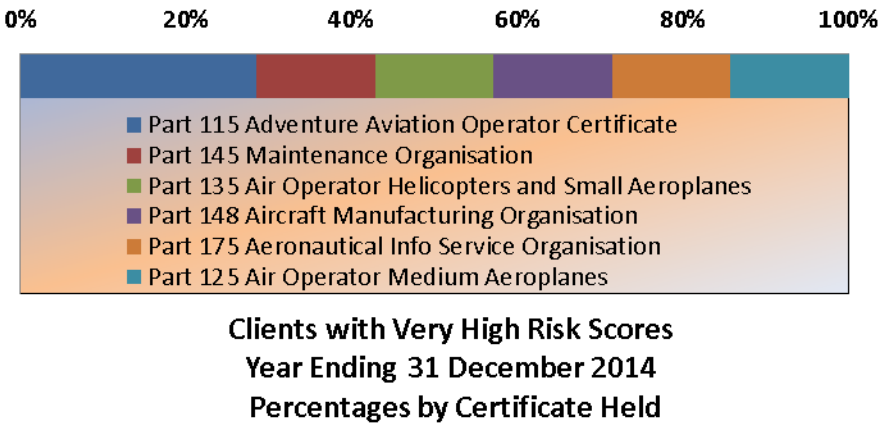
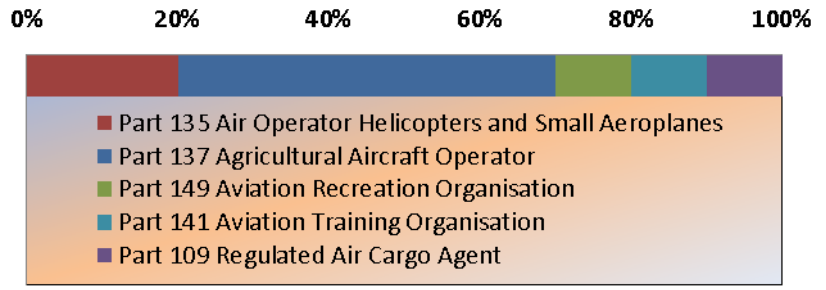
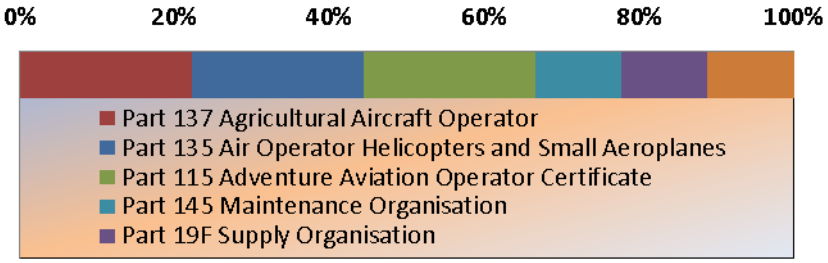
Measure	***Current Contributors***
Bird Hazard Incidents Reported Jan 2014 to Dec 2014 1203 (480 Strikes; 41%; 40%) Jan 2013 to Dec 2013 1252 (519 Strikes) Annual average Jan 2010 to Dec 2012 1319.0 (484.0 Strikes; 37%) (No Bird Hazard incident reported during the 5 years covered by this report was Critical)	 **Bird Hazard Incidents for year ending Dec 2014** **Percentages by Nearest Reporting Point**
Security Incidents Reported Jan 2014 to Dec 2014 16 (0 Critical) Jan 2013 to Dec 2013 20 (0 Critical) Annual average Jan 2010 to Dec 2012 62.0 (0.0 Critical)	 **Security Incidents for year ending Dec 2014** **Percentages by Aircraft Type**  **Security Incidents for year ending Dec 2014** **Percentages by NRP**

Part 3 - Safety Outcomes – ARCs, Other Incidents	
Measure	***Current Contributors***
Aviation Related Concerns Reported Jan 2014 to Dec 2014 880 (3 Critical) Jan 2013 to Dec 2013 814 (2 Critical) Annual average Jan 2009 to Dec 2012 774.7 (0.7 Critical)	· The coding of ARCs is such that no useful analysis is currently possible · 282 (32%) of ARCs received during the January to December 2015 period were actually Section 13A notifications that are treated as ARCs because there is no other procedure defined for processing them.
All Other Incidents Reported (Dangerous Goods, Facility Malfunction, Cargo Security, Promulgated Information) Jan 2014 to Dec 2014 106 (0 Critical) Jan 2013 to Dec 2013 159 (0 Critical) Annual average Jan 2010 to Dec 2012 98.3 (0.3 Critical)	 All Other Incidents for year ending Dec 2014 Percentages by NRP  All Other Incidents for year ending Dec 2014 Percentages by Aircraft Type  All Other Incidents for year ending Dec 2014 Percentages by Safety Outcome Target Group

Part 3 - Safety Outcomes – Non Compliance (See here for more information)	
Measure	***Current Contributors***
Median Non-Compliance Index Jan 2014 to Dec 2014 32.4 Jan 2013 to Dec 2013 23.1 Annual average Jan 2010 to Dec 2012 26.5	

Part 3 - Safety Outcomes – Risk Scores

(See here for more information)

Measure	*Current Contributors*
Number of Clients with Risk Score of 'Very High' Jan 2014 to Dec 2014 7 Jan 2013 to Dec 2013 4 Annual average Jan 2010 to Dec 2012 6.7	 Clients with Very High Risk Scores Year Ending 31 December 2014 Percentages by Certificate Held
Number of Clients with Risk Score of 'High' Jan 2014 to Dec 2014 10 Jan 2013 to Dec 2013 8 Annual average Jan 2010 to Dec 2012 8.7	 Clients with High Risk Scores Year Ending 31 December 2014 Percentages by Certificate Held  Clients with High Risk Scores Year Ending 30 June 2014 Percentages by Certificate Held

All size, activity and occurrence values quoted are based on data as reported to the CAA.

Reporting rates vary widely depending on the nature and severity of incidents.

Activity data reporting varies widely between sectors in both accuracy and completeness

Air Transport Flights and All Hours Flown values have been adjusted to allow for the probable activity levels of aircraft for which an expected Aircraft Operations Statistics return has not been received

Industry Size and Activity Data

Registered Aircraft

The following table summarises the number of aircraft on the register by Aircraft Category at 31 Dec 2014, 31 Dec 2013 and the average of the numbers at the end of each of the three years before that.

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	128	128	123.7
Medium Aeroplanes	78	79	78.7
Small Aeroplanes	1497	1514	1523.0
Helicopters	831	795	771.7
Sport Aircraft	1984	1943	1901.7
Agricultural Aeroplanes	97	103	108.7
Total	4615	4562	4507.3

The total number of aircraft on the register has decreased by 53 (1.1%). The number of small aeroplanes is now falling slightly. Helicopter numbers are increasing.

Licences

The following table summarises the number of airline transport, commercial, private and recreational pilot, air traffic controller, and aircraft maintenance engineer licences on the register at 31 Dec 2014, 31 Dec 2013 and the average of the numbers at the end of each of the three prior years.

Licences	31 Dec 2014	31 Dec 2013	Annual Average Jan 2010-Dec 2013
RPL	320	281	197.0
ATCL	379	380	362.3
ATPL	2,224	2,172	2,091.7
LAME	2,726	2,660	2,552.0
PPL	2,617	3,017	3,509.7
CPL	4,567	4,721	4,633.3
Total	12,833	13,231	13,346.0

Note — the statistics above for pilot licences count only those with active class 1 or active class 2 medical certificates or, for RPL holders, a certificate, issued in accordance with the NZTA medical fitness standards that are applicable for a Class 2, 3, 4 or 5 driver licence with passenger endorsement. This means that for CPL and ATPL licences, the number with a class 2 medical only, must only be exercising PPL privileges (or not flying at all). The statistics for ATCL holders count only those with an active class 3 medical certificate.

These statistics show the number of licences held and slightly overestimate the number of licence holders, as each holder may hold more than one licence.

Certificated Operators

The following tables show the number of Civil Aviation Rule Part certificate holders at 31 Dec 2014, 31 Dec 2013 and the average of the numbers at the end of each of the three prior years.

Rule Part	31 Dec 2014	31 Dec 2013	Average 3 Prior Yrs
Part 119 Air Operator	175	178	183.7
Part 137 Agricultural Aircraft Operator	97	99	105.7
Part 109 Regulated Air Cargo Agent	65	66	64.0
Part 19 Supply Organisation Certificate of Approval	59	56	57.7
Part 145 Aircraft Maintenance Organisation	56	63	63.3
Part 141 Aviation Training Organisation	55	56	57.3
Part 92 Dangerous Goods Packaging Approval	55	59	57.3
Part 129 Foreign Air Operator	31	31	32.0
Part 115 Adventure Aviation Operator	27	34	11.3
Part 139 Aerodromes	27	27	26.3
Part 148 Aircraft Manufacturing Organisation	20	20	21.7
Part 146 Aircraft Design Organisation	14	14	14.0
Part 149 Aviation Recreation Organisation	8	8	7.7
Part 173 Instrument Flight Procedure Service Organisation	3	3	3.0
Part 171 Aeronautical Telecommunication Service Organisation	2	2	2.0
Part 172 Air Traffic Service	2	2	2.0
Part 174 Meteorological Service Organisation	2	2	2.0
Part 175 Aeronautical Information Service Organisation	2	1	1.0
Pilotless Aircraft Authorisation	2	8	1.0
Part 140 Aviation Security Service	1	1	1.0
Australian AOC Operating with ANZA Privileges	1	2	1.7
Total	704	732	715.3

* Note:

- For organisations with Part 92 and for those with Part 172 certificates the figures show the total number of services that are certificated. This does not necessarily equate to the number of organisations that hold the certificate.

Part 119 Air Operator	31 Dec 2014	31 Dec 2013	Annual Average Jan 2010-Dec 2013
Part 135 Helicopters and Small Aeroplanes	165	166	172.7
Part 108 Security Programme	16	19	18.3
Part 125 Medium Aeroplanes	12	15	15.3
Part 121 Large Aeroplanes	8	9	9.3

Part 129 Air Operator	31 Dec 2014	31 Dec 2013	Annual Average Jan 2010-Dec 2013
Part 108 Security Programme	22	23	23.3

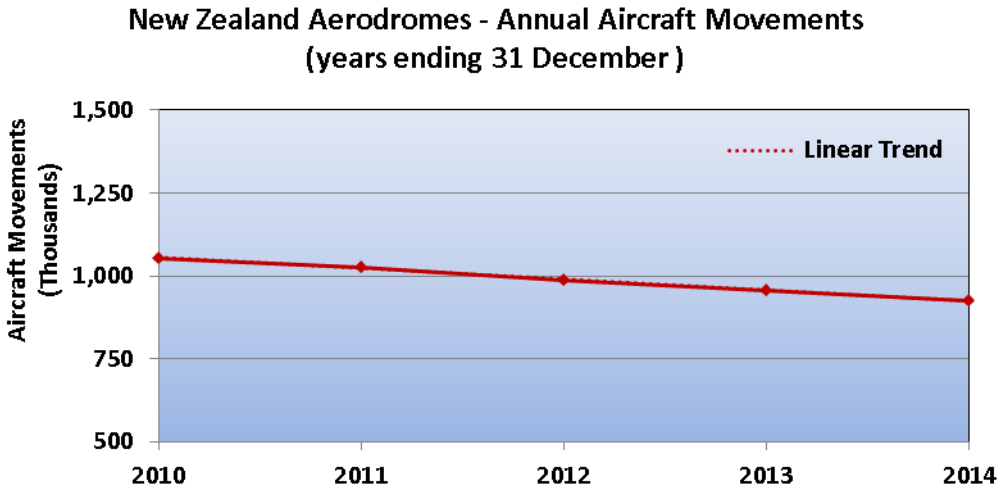
Aircraft Movements

Quarterly aircraft movement numbers are supplied to us by Airways Corporation for all aerodromes that they service, either by way of a control service or an information service. In addition Taupo airport voluntarily supplies movement information on a regular basis. A movement is defined as a takeoff or a landing but touch-and-go operations are not defined. Airways counts each as a single movement, Taupo Airport counts each as two movements. This means that Taupo's values may not be validly compared with other aerodromes' but can of course be used to inform trends over time.

The following graph and table show the number of aircraft movements at the following aerodromes: Auckland, Christchurch, Dunedin, Gisborne, Hamilton, Invercargill, Milford Sound, Napier, Nelson, New Plymouth, Ohakea, Palmerston North, Paraparaumu, Queenstown, Rotorua, Taupo, Tauranga, Wellington, Whenuapai and Woodbourne.

Long-Term Change in Aircraft Movements

The following graph shows the annual number of aircraft movements for the five-year period ending 31 December 2014. Paraparaumu Airport has been omitted from this long term analysis because the available data is incomplete because there has only been a flight information service available since October 2011.



The average annual decrease in the number of aircraft movements was 3.2% from the year ended 31 December 2010 until the year ended 31 December 2014 during which 926127 movements were recorded.

Yearly Comparison

The following table shows the number of Aerodrome movements in the period 1 January 2014 to 31 December 2014, the previous year and the average of the movement numbers during the 3 years before that. For consistency Paraparaumu Airport movements have also been omitted from this table

Activity	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Aircraft Movements	926127	955340	1022362.3

Aircraft Movements at Aerodromes

The aerodromes are shown in descending order of the number of aircraft movements for the year ending 31 December 2014. The figures all relate to years ending 31 December.

Aerodrome	2010	2011	2012	2013	2014
Auckland	157,201	156,655	156,062	157,141	153,092
Hamilton	99,308	110,419	128,744	135,404	129,050
Christchurch	125,611	121,469	109,444	107,754	112,568
Wellington	109,193	105,988	102,488	101,279	96,084
Tauranga	86,935	74,400	72,652	70,450	58,448
Palmerston North	56,439	65,708	67,395	55,960	52,655
Nelson	51,570	50,094	48,073	45,677	46,770
Queenstown	42,347	41,769	43,776	43,012	45,620
Ohakea	61,896	55,726	30,959	28,807	36,512
Paraparaumu	0	12,832	33,702	31,241	24,279
Dunedin	44,003	29,229	25,328	22,758	22,750
Napier	27,172	27,332	25,242	24,386	22,728
Taupo	28,774	26,376	25,536	23,814	22,642
New Plymouth	37,097	32,791	30,773	24,910	21,831
Woodbourne	22,829	23,660	22,689	21,826	20,451
Rotorua	23,380	22,682	22,092	22,532	20,143
Invercargill	29,279	30,840	28,491	23,058	19,960
Gisborne	22,174	22,459	19,594	17,671	15,897
Whenuapai	14,347	14,675	14,915	15,419	14,946
Milford Sound	14,042	13,043	12,902	13,482	13,980

Data for Paraparaumu from October 2011 onwards has been supplied by Airways Corporation. The value for 2011 includes only the portion of 2011 for which the Information Service was active.

No information is available for Ardmore aerodrome although it is reported in the AIP as NZ's busiest aerodrome. The recent increase in movements at Hamilton is noteworthy and it is now the 2nd busiest aerodrome for which data is available.

This data is graphed on the next page.

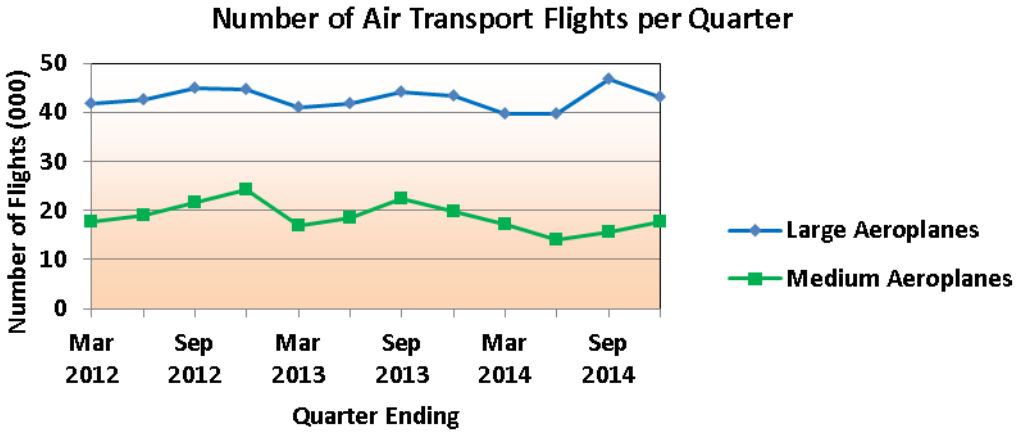
The aerodromes are grouped by the largest number of movements over the period of this report

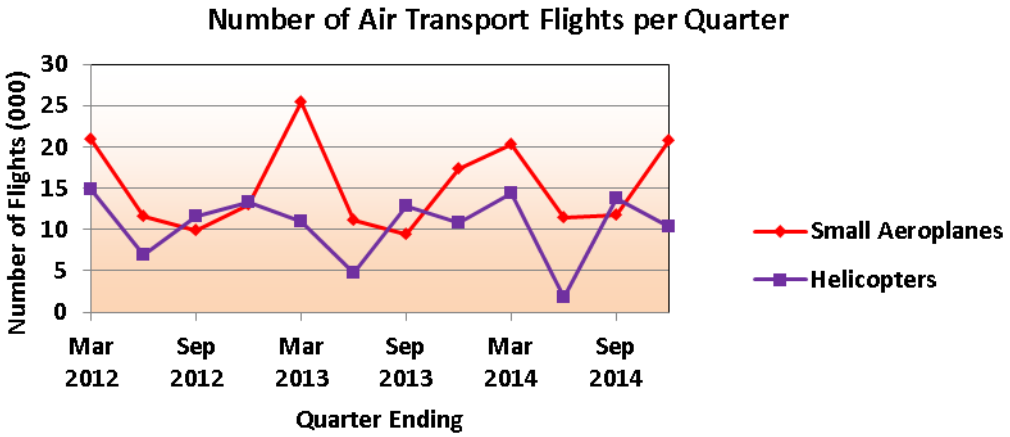
Note that the scales are different for each chart to prevent the smaller aerodromes' graphs from becoming unreadable that would happen if all the charts had the same scales.

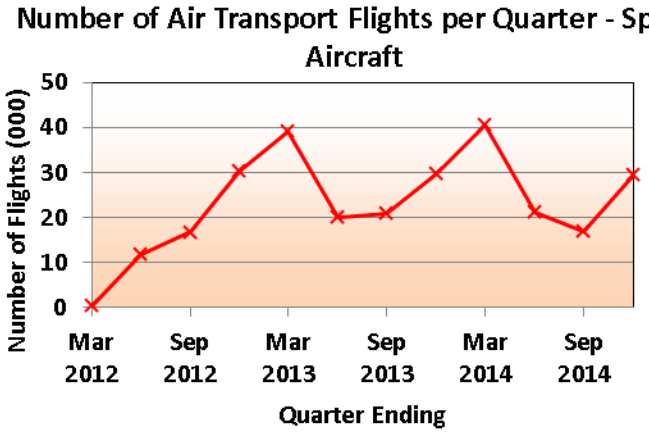
Air Transport Flights

Note that these graphs exclude foreign registered aircraft that are operated in New Zealand.

The following graphs show the estimated number of air transport flights per quarter during the three year period ending 31 December 2014. The estimates are based on the reported numbers of flights with an allowance for aircraft for which reports were not received

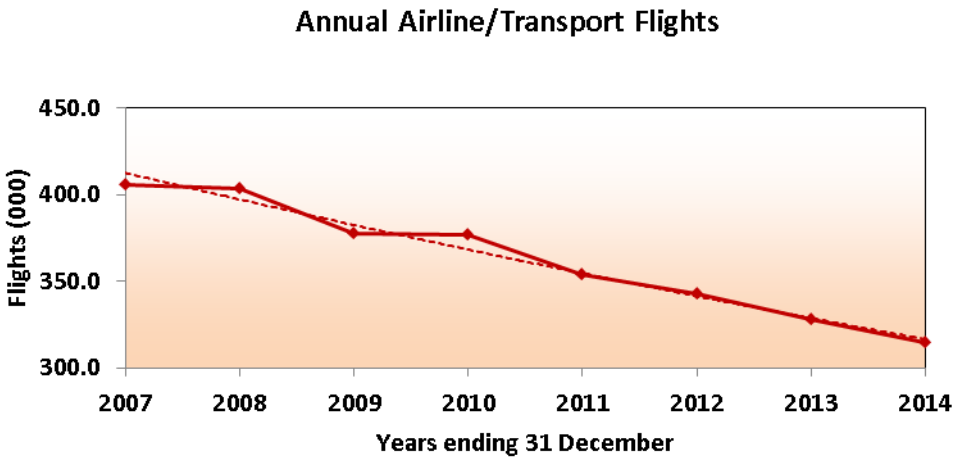






Long-Term Change in Airline/Transport Flights

The following graph shows the estimated number of airline/transport flights for the 7-year period ending 31 December 2014



The change in the estimated number of annual airline/transport flights across this period is equivalent to an annual decrease of 3.57%.

The table below shows that the reduction is driven by reduced reported air transport flights by medium aeroplanes.

Yearly Comparison

Number of Airline/Transport Flights

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	169210	170185	175900.5
Medium Aeroplanes	58821	71164	78923.4
Small Aeroplanes	46238	46180	49387.1
Helicopters	40123	39399	52501.7
Sport Aircraft	17	1018	803.5
Total	314409	327946	357516.2

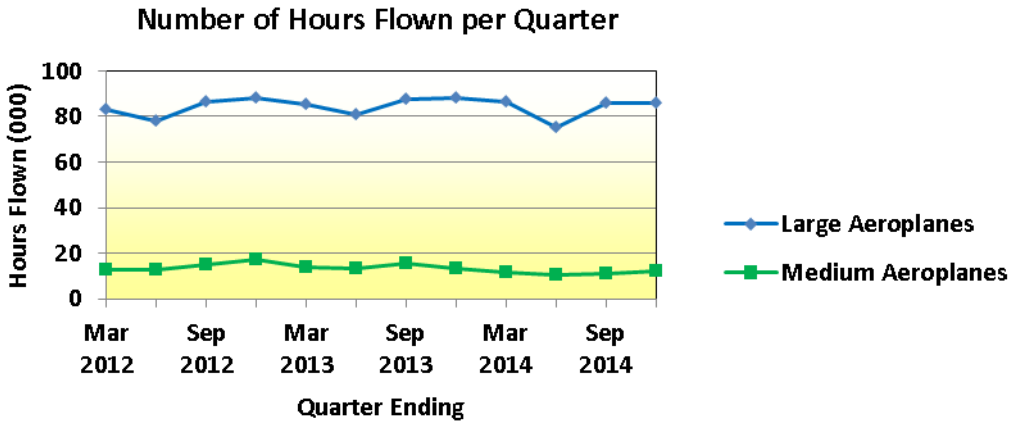
Note:

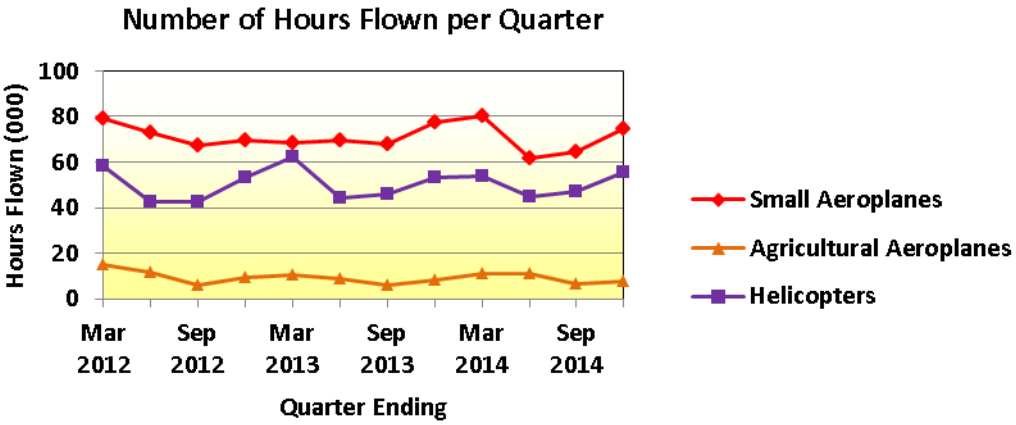
Adventure Aviation (Part 115) flights have been excluded from this comparison

Hours Flown

Note that these graphs exclude the aircraft statistics categories Sport Aircraft and Hang Gliders except where the aircraft are approved for use in Part 115 operations. Parachutes and foreign registered aircraft that are operated in New Zealand are also excluded.

The following graphs show the estimated number of hours flown per quarter during the three year period ending 31 December 2014. The estimates are based on the reported hours with an allowance for aircraft for which reports were not received. Recent improvements in the collection procedure for operating statistics data have resulted in improved return rates with a consequent improvement in confidence in the published data.





Comment on Estimated Activity Data

Not all operators comply with the requirements of CAR 12.151 to report hours and flights data. An allowance is made for the 'missing' data by applying a statistical estimating process to each quarter's data.

The estimation method is based either on the average reported activity for aircraft of the same category, class, operation type and period or on previously reported or estimated activity for the same category, class and operation type. The choice of estimating method is based on the response rate for the corresponding aircraft category and class.

The following table shows the percentage of aircraft for which returns had been entered for the January to December 2014 period at the time of compilation, which is at least 6 weeks after the last of the returns was due.

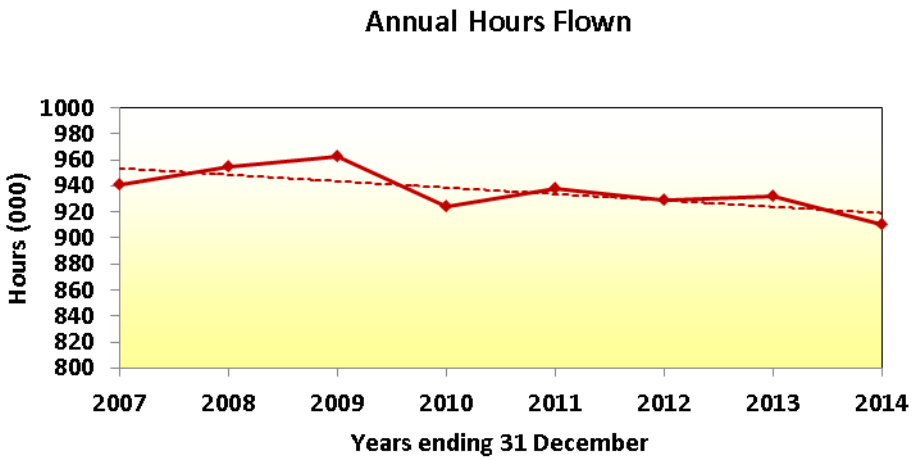
Aircraft Category	Percentage of Expected Returns Received and Entered
Sport Aircraft - Helicopters	100%
Large Aeroplanes	97.9%
Sport Aircraft - Parachutes	84.5%
Medium Aeroplanes	84.3%
Agricultural Aeroplanes	77.4%
Sport Aircraft - Aeroplanes	60.7%
Helicopters	57.0%
Small Aeroplanes	55.3%
Sport Aircraft - Balloons	43.1%
Sport Aircraft - Hang Gliders	40.3%
Sport Aircraft - Paragliders	37.0%

The overall value is 56.8% of expected aircraft returns received, which means we had to estimate the operational statistics for 43% of all returns.

Increasing use of email is now being made to issue reminders and the above return rate reflects a marked improvement on the previous year.

Long-Term Change in Hours Flown

The following graph shows the annual hours flown (includes the aircraft classes aeroplane, helicopter and balloon only; excludes other aircraft classes, hang gliders and parachutes) for the 7-year period ending 31 December 2014.



The change in the estimated number of annual hours flown across this period is equivalent to an annual decrease of 0.47%. The linear trend in these reported hours is equivalent to an annual decrease of 0.52%.

Yearly Comparison

Hours Flown

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	333200.2	341782.7	325872.8
Small Aeroplanes	281127.0	283638.1	312578.9
Helicopters	200973.5	205602.2	190298.5
Medium Aeroplanes	45601.3	55488.4	56634.0
Agricultural Aeroplanes	36465.0	33530.0	38815.8
Sport Aircraft	12789.1	11670.4	6051.1
Total	910156.2	931711.7	930251.1

Seat-Hours

The following table indicates the size of the aviation industry as determined from Aircraft Operating Statistics in the relevant 2010 Safety Target Group categories for the year ending 31 December 2014. A seat-hours measure is used as an indication of person exposure. For each Safety Target Group the total number of hours flown is multiplied by the average number of seats and an appropriate load factor, to give the number of seat hours utilised by the group (person exposure). For Safety Target Groups that are not predominantly passenger carrying a surrogate of 500 kg of aircraft weight is used instead of seat hours. The values are millions of seat-hours.

Safety Outcome Target Group	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Airline Operations - Large Aeroplanes	**49.08 (96.8%)**	49.65 (96.6%)	47.97 (96.3%)
Airline Operations - Medium Aeroplanes	**0.53 (1.0%)**	0.67 (1.3%)	0.70 (1.4%)
Airline Operations - Small Aeroplanes	**0.09 (0.2%)**	0.09 (0.2%)	0.11 (0.2%)
Airline Operations - Helicopter	**0.15 (0.3%)**	0.12 (0.2%)	0.13 (0.3%)
Sport Transport	**0.09 (0.2%)**	0.10 (0.2%)	0.09 (0.2%)
Other Commercial Operations - Aeroplane	**0.22 (0.4%)**	0.25 (0.5%)	0.27 (0.6%)
Other Commercial Operations - Helicopter	**0.05 (0.1%)**	0.06 (0.1%)	0.10 (0.2%)
Agricultural Operations - Aeroplane	**0.05 (0.1%)**	0.04 (0.1%)	0.05 (0.1%)
Agricultural Operations - Helicopter	**0.08 (0.2%)**	0.09 (0.2%)	0.10 (0.2%)
Private Operations - Aeroplane	**0.04 (0.1%)**	0.04 (0.1%)	0.05 (0.1%)
Private Operations - Helicopter	**0.04 (0.1%)**	0.04 (0.1%)	0.04 (0.1%)
Private Operations - Sport	**0.27 (0.5%)**	0.27 (0.5%)	0.23 (0.5%)
Total	**50.69 (100.0%)**	51.42 (100.0%)	49.84 (100.0%)

Most sport aircraft do not report hours or seats, so a standard estimate of seat hours offered is used as well as reported data for such aircraft in these groups.

Note that the percentages may not sum exactly to 100.0% due to rounding.

This table shows that approximately 96.8% of seat hours were offered by the Airline Operations – Large Aeroplanes group, approximately 1.0% by the Airline Operations – Medium Aeroplanes group, with the remaining 2.2% of seat hours offered being split between the other safety target groups.

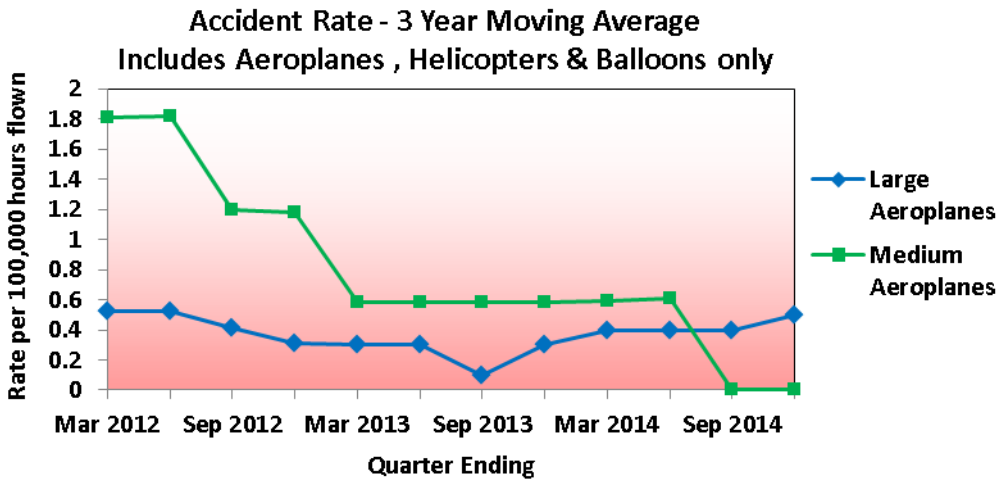
By comparison the 333,200 hours flown by the 130 large aircraft is similar to the 281,127 hours flown by the 1547 small aeroplanes on the register. The difference in passenger exposure is largely a function of the seating capacity.

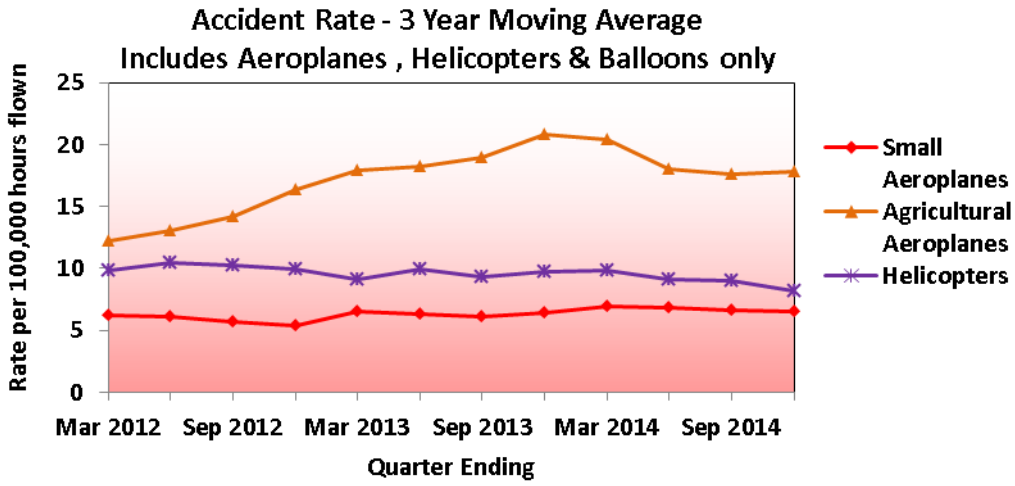
Occurrence Analysis

Aircraft Accidents

The following graphs show the aircraft accident rates (accidents per estimated 100,000 hours flown) three year moving average for the three-year period ending 31 December 2014 (excluding the aircraft statistics categories Sport Aircraft, Hang Gliders and Parachutes). Trends for each group are shown immediately following the group. Dashed segments indicate significant use of activity forecasting usually as a result of insufficient operational statistics data returns having been received.

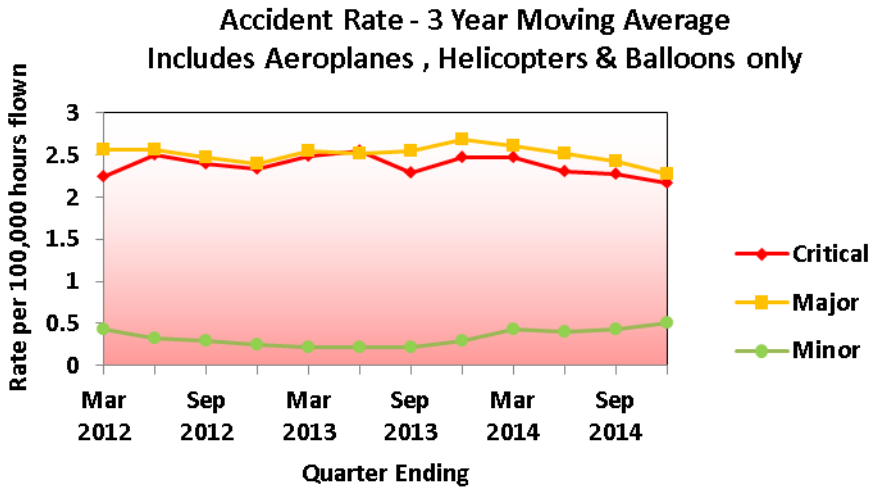
Breakdown by Aircraft Category





Aircraft Category	Straight Line Trend of 3 Year Moving Average
Large Aeroplanes	Not Significant
Medium Aeroplanes	Trending Down
Small Aeroplanes	Not Significant
Agricultural Aeroplanes	Trending Up
Helicopters	Not Significant

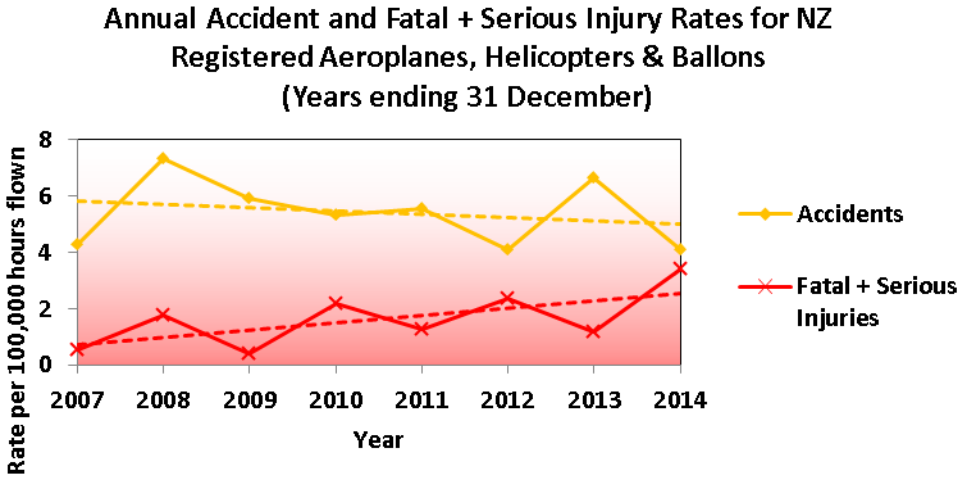
Breakdown by Severity



Severity	Straight Line Trend of 3 Year Moving Average
Critical	Not Significant
Major	Not Significant
Minor	Trending Up

Long-Term Accident Rate

The following graph shows the overall annual accident rate per 100,000 hours flown for the 7 year period ending 31 December 2014. Hang gliders and parachutes are excluded because no reliable activity data is available for those classes.



Note that this graph does not show a moving average and because it also includes some but not all sport aircraft it is not appropriate to compare it to the other accident rate graphs in the report.

Yearly Comparisons – counts, not rates

Critical Accidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	0	1	0.0
Medium Aeroplanes	0	0	0.0
Small Aeroplanes	9	8	6.3
Helicopters	9	10	12.3
Sport Aircraft	12	12	15.0
Agricultural Aeroplanes	2	2	2.0
Hang Gliders	5	9	5.7
Parachutes	7	1	3.3
Unknown	0	1	0.0
Total	44	44	44.7

Major Accidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	1	1	0.7
Medium Aeroplanes	0	0	0.3
Small Aeroplanes	3	18	9.3
Helicopters	5	9	6.7
Sport Aircraft	21	18	15.7
Agricultural Aeroplanes	0	6	3.7
Hang Gliders	4	2	3.0
Parachutes	2	2	4.3
Unknown	2	0	1.0
Total	38	56	44.7

Minor Accidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	2	0	0.3
Medium Aeroplanes	0	0	0.3
Small Aeroplanes	5	2	1.0
Helicopters	0	1	0.0
Sport Aircraft	9	5	1.3
Agricultural Aeroplanes	1	1	0.7
Hang Gliders	9	3	5.3
Parachutes	3	2	1.0
Unknown	0	1	0.3
Total	29	15	10.3

All Accidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	3	2	1.0
Medium Aeroplanes	0	0	0.7
Small Aeroplanes	17	28	16.7
Helicopters	14	20	19.0
Sport Aircraft	42	35	32.0
Agricultural Aeroplanes	3	9	6.3
Hang Gliders	18	14	14.0
Parachutes	12	5	8.7
Unknown	2	2	1.3
Total	111	115	99.7

Safety Target Structure

The 2010 Safety Targets classify all New Zealand aviation under three broad group headings: Public Air Transport, Other Commercial Operations, and Non-commercial Operations. Thirteen further sub-groups enable differentiation between aeroplanes, helicopters, and sport aircraft, and also allow for different weight groups. This section presents the same accidents as the previous section but classified by type of operation (sector) rather than type of aircraft.

Number of Accidents

The following table shows, for each safety target group, the number of accidents each year for the one year period ending 31 December 2014, the previous year and the annual average for the three prior years. All aircraft types are included

Safety Outcome Target Group	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Airline Operations - Large Aeroplanes	**3**	2	1.0
Airline Operations - Medium Aeroplanes	**0**	0	0.7
Airline Operations - Small Aeroplanes	**1**	3	1.7
Airline Operations - Helicopter	**4**	6	2.0
Sport Transport	**12**	3	9.0
Other Commercial Operations - Aeroplane	**8**	9	8.3
Other Commercial Operations - Helicopter	**4**	4	6.3
Agricultural Operations - Aeroplane	**3**	9	6.0
Agricultural Operations - Helicopter	**3**	4	5.0
Private Operations - Aeroplane	**8**	15	6.0
Private Operations - Helicopter	**3**	6	5.7
Private Operations - Sport	**61**	52	47.0
Other	**1**	2	1.0
Total	**111**	**115**	**99.7**

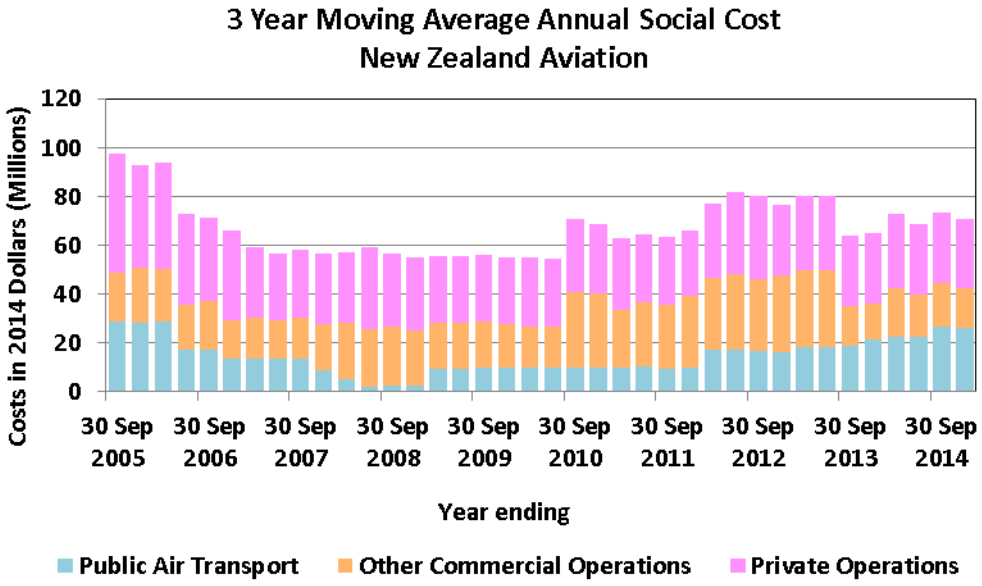
Social Cost

Social cost is the cost of fatal, serious and minor injuries and aircraft destroyed. The following table displays the social cost expressed in in millions of 2014 dollars for each safety target group for the year ending 31 December 2014, the previous year and the annual average for the three years before that.

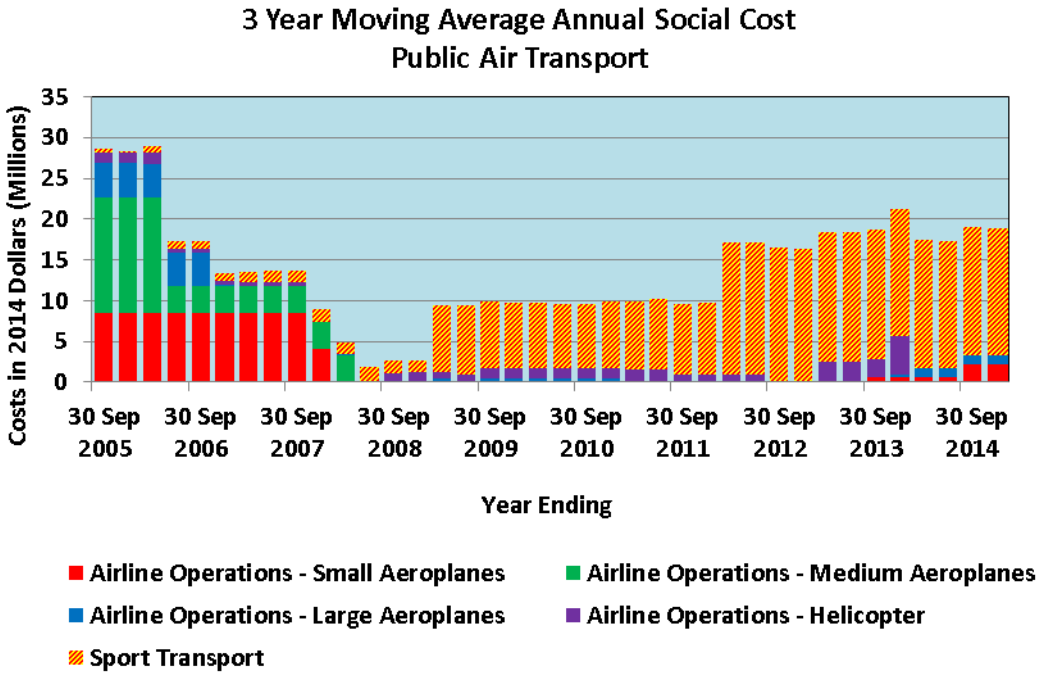
Safety Outcome Target Group	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Private Operations - Sport	**15.25**	14.64	20.53
Agricultural Operations - Helicopter	**11.88**	4.63	2.29
Other Commercial Operations - Aeroplane	**10.71**	0.78	15.34
Private Operations - Helicopter	**9.44**	0.99	4.67
Airline Operations - Helicopter	**8.90**	13.57	0.26
Private Operations - Aeroplane	**5.39**	0.17	3.63
Other Commercial Operations - Helicopter	**5.06**	0.79	11.49
Airline Operations - Small Aeroplanes	**4.98**	1.74	0.06
Agricultural Operations - Aeroplane	**2.52**	0.02	2.14
Airline Operations - Large Aeroplanes	**2.45**	0.99	0.03
Sport Transport	**1.75**	0.66	16.07
Airline Operations - Medium Aeroplanes	**0.00**	0.00	0.00
Other	**0.00**	8.27	0.00
Total	**78.33161705**	47.2	76.50

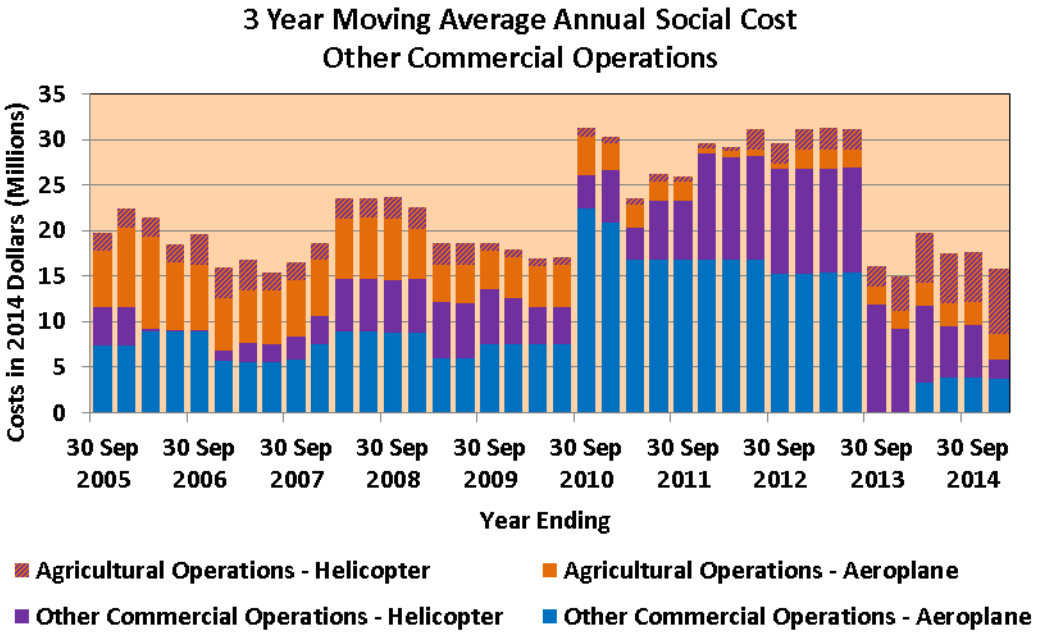
The following charts show the annual social cost (3 year moving average) for each Safety Target Group for the period 1 October 2005 31 December 2014. Note that the Sport groups include hang gliders and parachutes.

The first chart shows a breakdown into the three major groups, Public Air Transport, Other Commercial and Private operational.

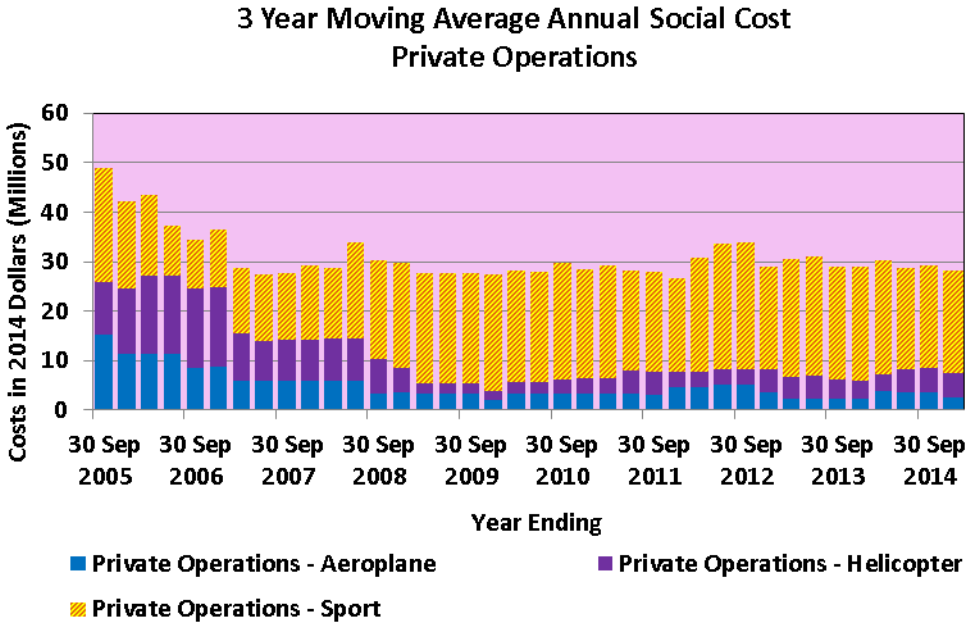


The next three charts show breakdowns of each of the major groups into their individual Safety Outcome Target Groups





The sudden drop to zero for the 'Other Commercial Aeroplane' series from mid 2013 was due to the Fox Glacier accident dropping out of the 3 year averaging process.



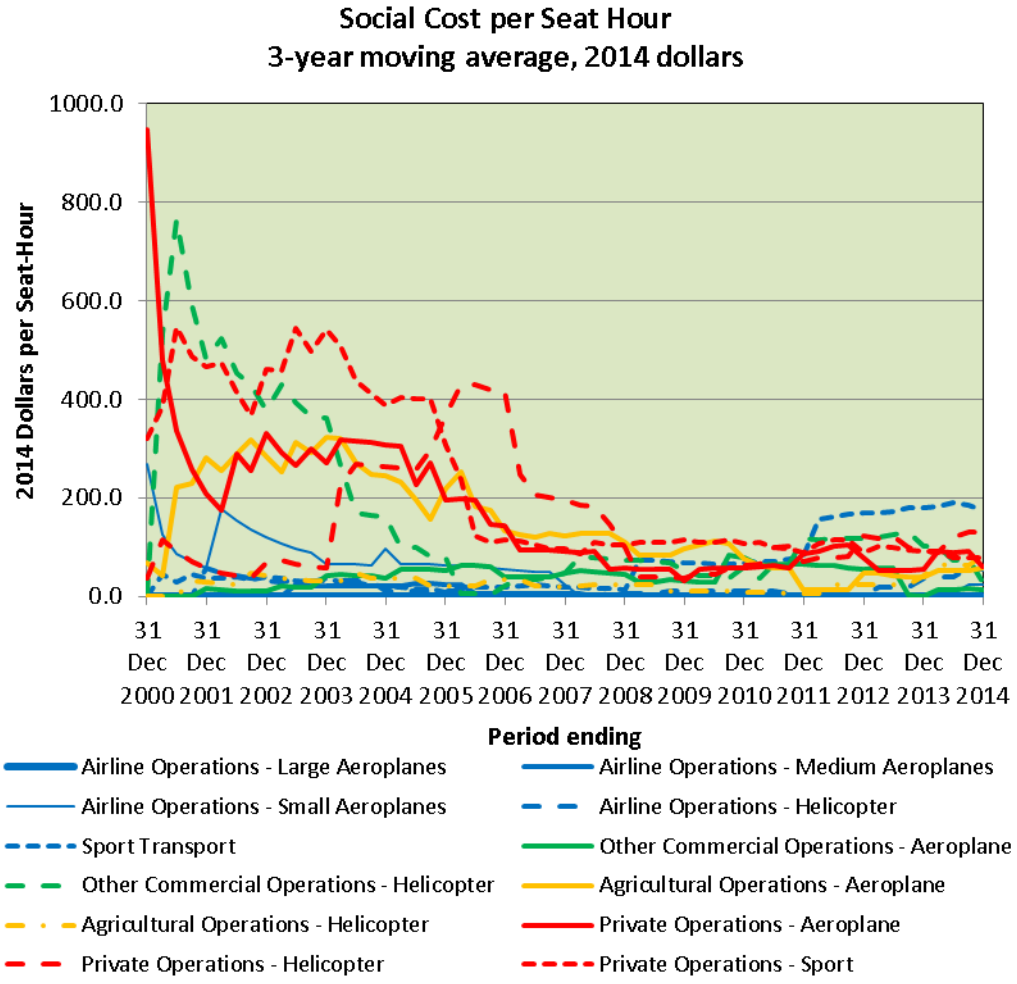
Note 'Private Operations –Sport' includes the aircraft types microlight, amateur-built, parachute and paraglider and accordingly represents a large number of aircraft.

The following graph illustrates an apparent steady decline in the Social Cost **per Seat-Hour** (three year moving average) over the period since the 3rd quarter of 2000.

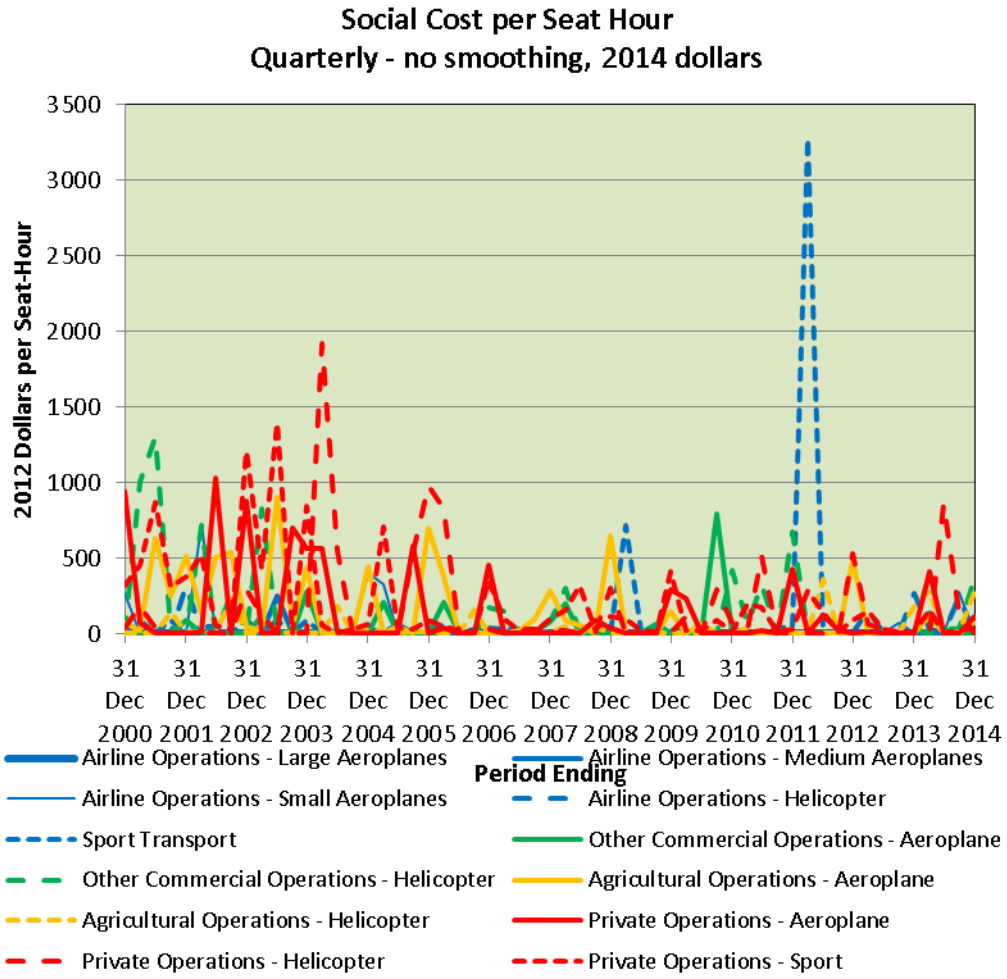
Since the 4th quarter of 2008 the decline has become relatively indiscernible and it may be that social cost levels have reached or are approaching a practical minimum for the current intervention practices.

The elevated level of the 'Sport Transport (Pt 115) group is still showing the effect of the Carterton Balloon Accident (3 year averaging).

Although the number of contributing aircraft is very small (5) the Private Operations – Helicopter group is showing an unwelcome trend.



However the use of 3-year moving average smoothing to render the graphs more readable has the side effect of masking any abrupt changes in the data. The following graph of the same data with all the smoothing removed shows that major unexpected downturns can occur with no prior warning from this kind of analysis.


Social Cost per Seat Hour
Quarterly - no smoothing, 2014 dollars
2012 Dollars per Seat-Hour
3500
3000
2500
2000
1500
1000
500
0
31 Dec 2000
31 Dec 2001
31 Dec 2002
31 Dec 2003
31 Dec 2004
31 Dec 2005
31 Dec 2006
31 Dec 2007
31 Dec 2008
31 Dec 2009
31 Dec 2010
31 Dec 2011
31 Dec 2012
31 Dec 2013
31 Dec 2014
Period Ending
Airline Operations - Large Aeroplanes
Airline Operations - Medium Aeroplanes
Airline Operations - Small Aeroplanes
Airline Operations - Helicopter
Sport Transport
Other Commercial Operations - Aeroplane
Other Commercial Operations - Helicopter
Agricultural Operations - Aeroplane
Agricultural Operations - Helicopter
Private Operations - Aeroplane
Private Operations - Helicopter
Private Operations - Sport

Safety Outcome Targets

Each target group has its own target level expressed as social cost per unit of passenger exposure, the unit being one seat hour. For target groups that are not predominantly passenger carrying a surrogate of 500 kg of aircraft weight is used instead of passenger exposure. These outcome targets represent the maximum level of social cost considered acceptable for each group.

The table below shows the average Safety Outcomes in 2014 dollars per seat-hour (including the cost of aircraft destroyed) for the three year period ending 30 December 2014. Target groups highlighted in yellow are groups where major safety improvements need to be achieved as the sector is significantly above the target level. Red text has been used to draw attention to groups with significant recent safety failures (accidents).

Safety Target Group	Current Estimate	Target
Airline Operations - Large Aeroplanes	0.02	0.00
Airline Operations - Medium Aeroplanes	0.00	0.02
Airline Operations - Small Aeroplanes	6.53	2.34
Airline Operations - Helicopter	39.24	6.50
Sport Transport	188.86	13.00
Other Commercial Operations - Aeroplane	14.30	6.50
Other Commercial Operations - Helicopter	71.90	6.50
Agricultural Operations - Aeroplane	53.18	14.00
Agricultural Operations - Helicopter	64.00	8.56
Private Operations - Aeroplane	89.49	10.00
Private Operations - Helicopter	119.51	10.00
Private Operations - Sport	78.03	20.00

Current Estimate:

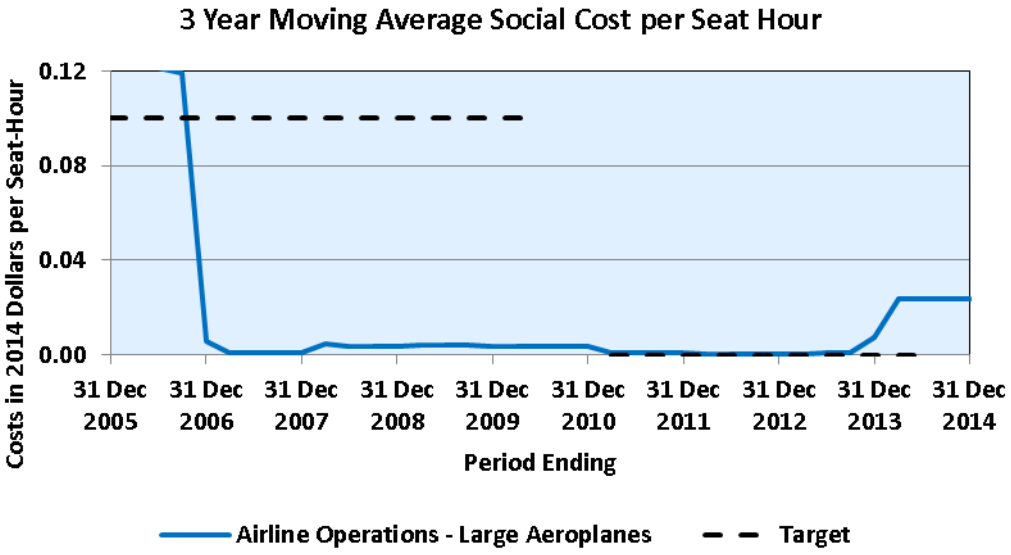
This is the estimated social cost of injuries and aircraft destroyed per seat hour for the three year period. Note: Aviation Safety reports prior to July to December 2008 used a 10 year averaging period for large and medium aeroplanes and a one year period for all others.

Target

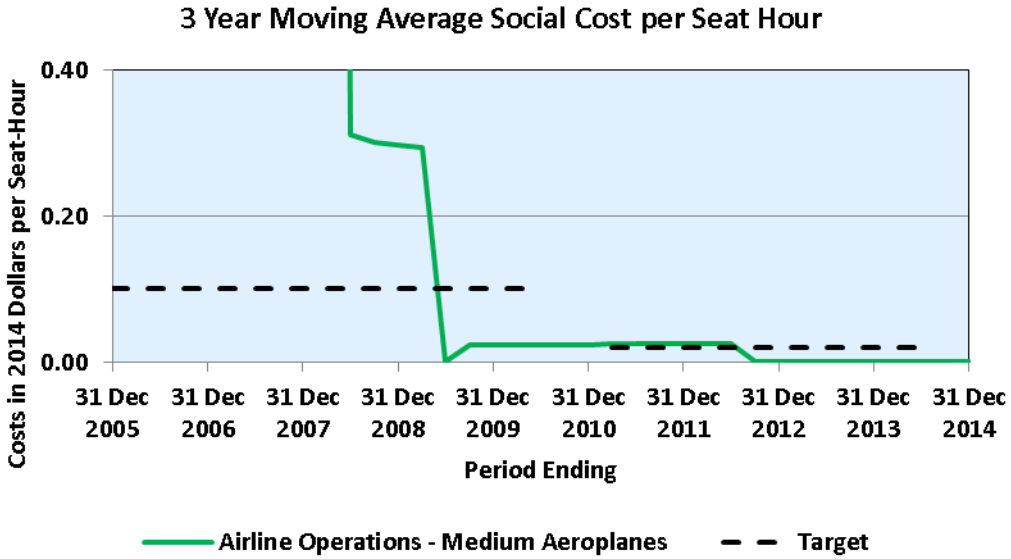
The targets in the above table were originally set in 2005 and although they were revised in 2011 they have not been inflation adjusted. The 2011 revision expired in 2014 and no new targets have been set. The targets listed above are therefore no longer current and are expressed in 2005 dollars. CPI inflation is approximately 24% over the period.

Safety Target Graphs

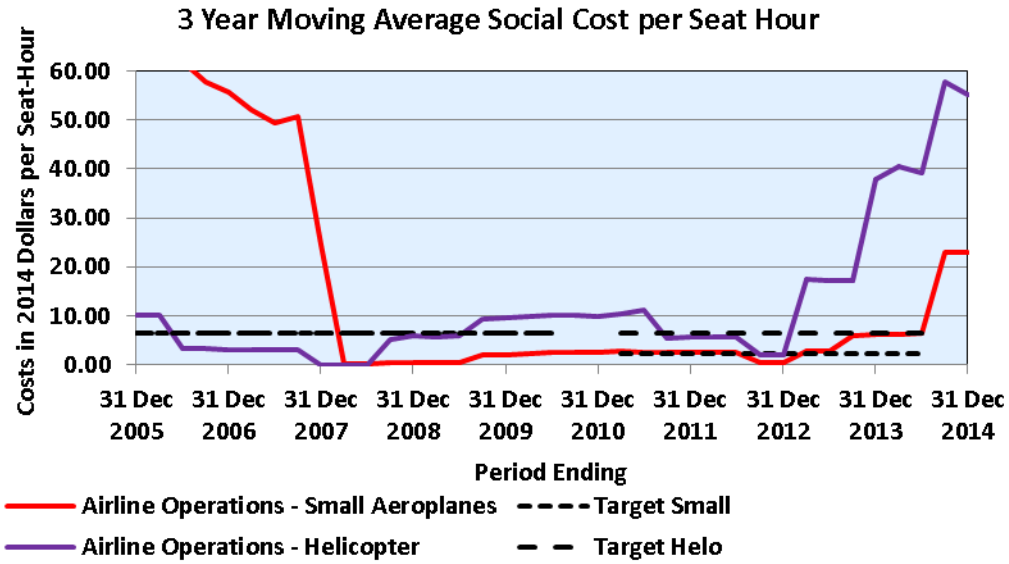
Graphs displaying the Safety Outcome Targets and the quarterly progress of Safety Outcomes derived using 3 year averages are shown on the following pages. These graphs span the period from 1 October 2005 when Social Cost targets were introduced to 31 December 2015.



The outcome for Airline Operations – Large Aeroplanes remained well below the initial target level of $0.10 per seat hour of exposure from late 2006 until the targets were revised in 2011. The new target appears on the graph as 0 but is actually $0.0034 and the current performance has been significantly below the target until recently. One recent serious injury and one incident where significant damage occurred has now taken the figure above the target. There is no significant recent trend either up or down. No fatal, 3 serious and 12 minor injuries were reported in this group during the 3 year period ending 31 December 2014.



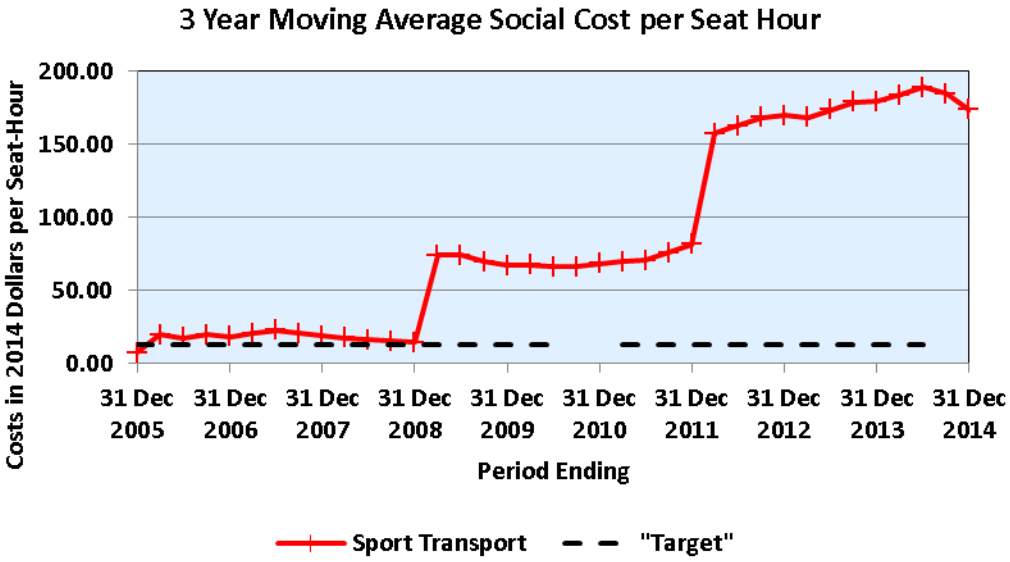
The outcome for Airline Operations – Medium Aeroplanes dropped below the initial target during the second quarter of 2009 and is trending down. The outcome is now below the new target of $0.02 per seat hour. No fatal, no serious and no minor injuries were reported in this group during the 3 year period ending 31 December 2014.



The outcome for **Airline Operations – Small Aeroplanes** was showing a significant long term downward trend from the high starting point of $45.64 per seat-hour of exposure in the three years to September 2007. The safety outcome for this group remained below the target level from early 2008 until early 2013. Since then it exceeded the target and **has continued to do**. There have been **1 fatal**, and 5 serious injuries reported in this group during the 3 year period ending 31 December 2014.

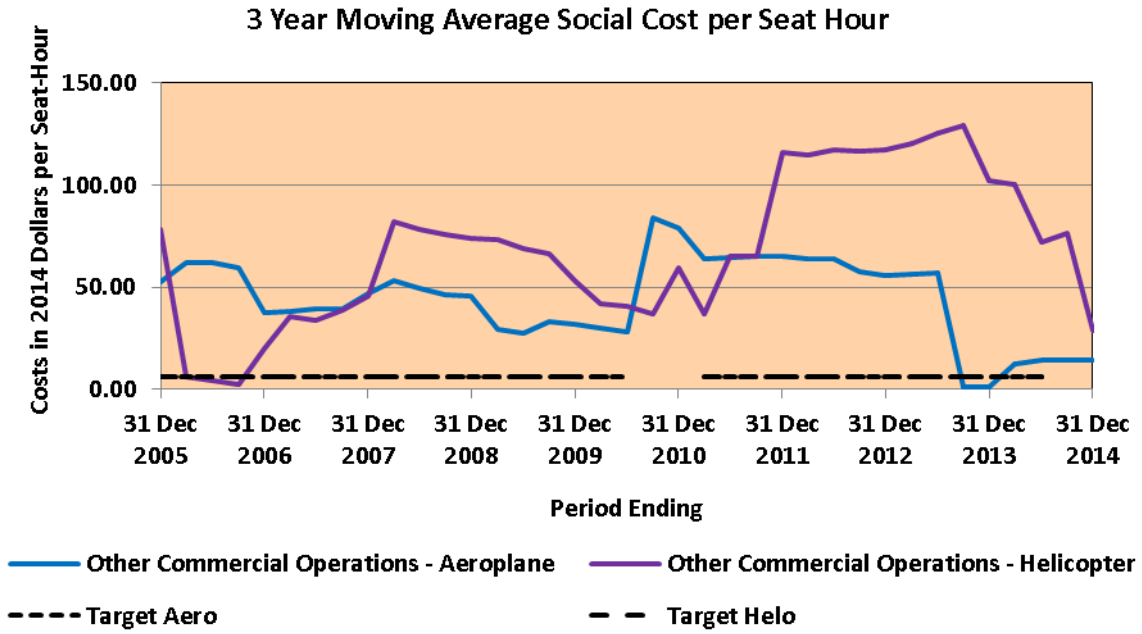
The outcome for **Airline Operations – Helicopter** exceeded the target level since the 3rd quarter of 2009. A small upward trend was evident. The target of $6.50 per seat hour d was achieved again from the 3rd quarter of 2011 until the 1st quarter of 2013 when two fatal injuries caused the target to be exceeded. Since early 2013 the social cost per seat hour has climbed steeply. There were 3 **fatal**, 5 serious and 9 minor injuries reported in this group during the 3 year period ending 31 December 2014.

The current Sector Risk Profile – Part 135 Passenger Operations was commissioned to look into the underlying factors which are contributing to the rising social cost in this sector. Results are due for publication in the second half of 2015.



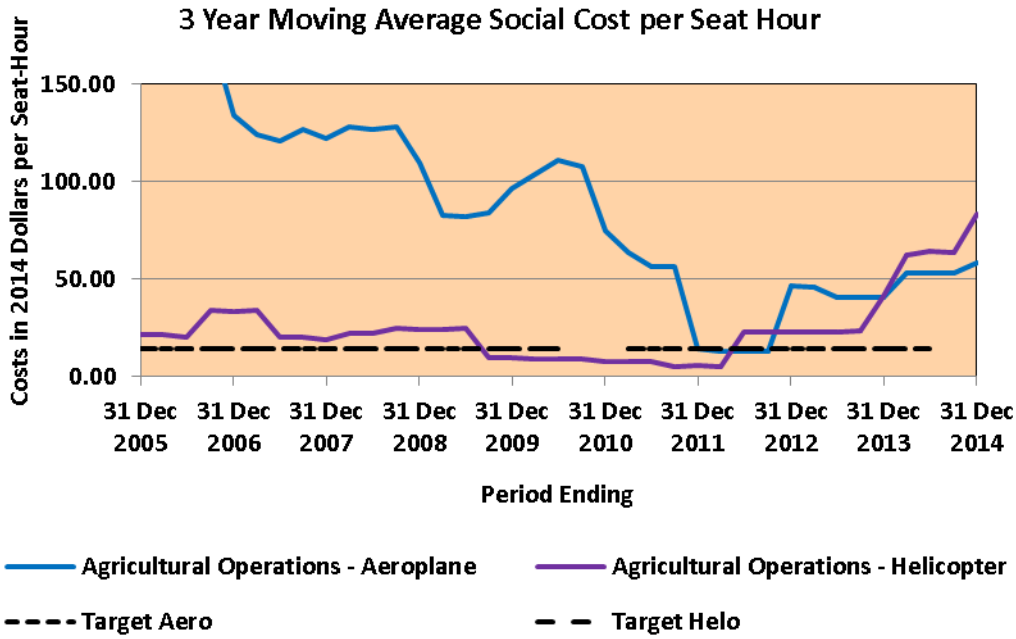
Two hang glider, two microlight and one glider fatalities during the first quarter of 2009 and 11 balloon fatalities in 2012 have contributed to a significant increase in the upward trend displayed by this group. The outcome exceeds the target of $13.00 by a large margin. **11 fatal**, 7 serious and 13 minor injuries were reported in this group during the 3 year period ending 31 December 2014.

Note that this group includes hang gliders and parachutes used on Part 115 air transport operations.



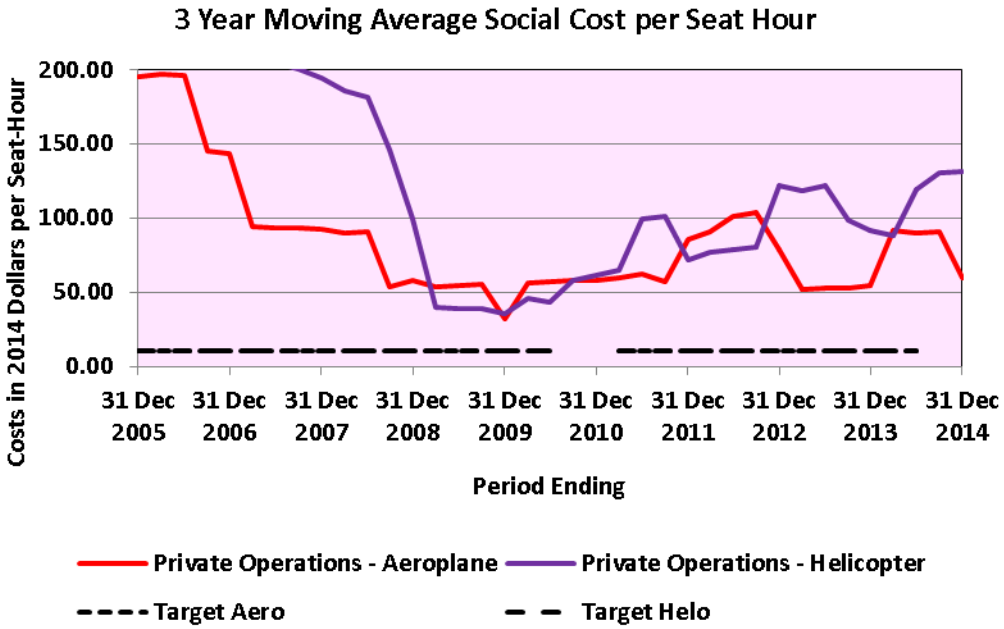
The outcome for Other Commercial Operations – Aeroplane briefly fell below the target of $6.50 per seat hour as a result of the Fox Glacier accident with 7 fatalities that worked its way out of the 3 year averaging period. Unfortunately 2 recent fatalities have reversed this trend. **2 fatal,** 6 serious and 1 minor injuries were reported in this group during the 3 year period ending 31 December 2014.

The outcome for Other Commercial Operations – Helicopter turned sharply upwards during the first quarter of 2008 and again in the 3rd quarter of 2011. It remains well above the target level of $6.50 per seat hour although a recovering trend is now emerging. **1 fatal**, 3 serious and 5 minor injuries were reported in this group during the 3 year period ending 31 December 2014.



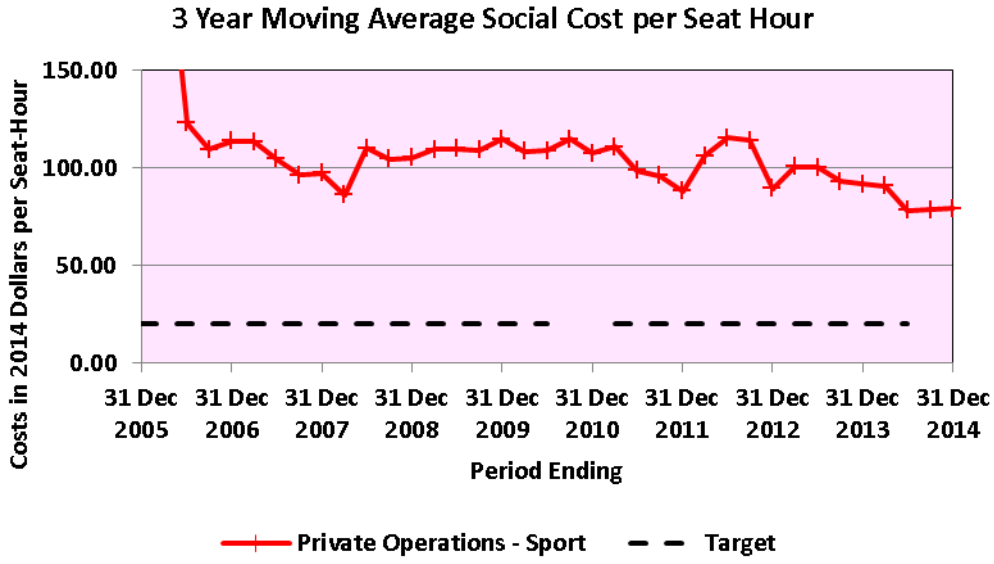
The outcome for Agricultural Operations – Aeroplanes has been well above the target level of $14.00 per seat hour but has been steadily trending down and this group achieved its target in the 4th quarter of 2011. A fatality in the 4th quarter of 2012 again took the outcome above the target where it has remained with no sign yet of a recovery. **1 fatal**, 4 serious and 1 minor injuries were reported in this group during the 3 year period ending 31 December 2014.

The outcome for Agricultural Operations – Helicopter was below the target level of $8.56 per seat hour from the 3rd quarter of 2009 until the 2nd quarter of 2011 but a fatality during that quarter resulted in the target again being exceeded. A worsening trend is evident. 4 fatal, 1 serious and 1 minor injuries were reported in this group during the 3 year period ending 31 December 2014.



The outcome for Private Operations – Aeroplanes had been slowly trending down since late 2005 but remained well above the target of $10.00 per seat hour. The downward trend reversed in the first quarter of 2010 and an upward trend has continued since then. **1 fatal**, 5 serious and 5 minor injuries were reported in this group during the 3 year period ending 31 December 2014.

The outcome for Private Operations – Helicopters was trending down from early 2006 but remained above the target of $10.00 per seat hour. From the first quarter of 2009 the downward trend has reversed. **3 fatal**, 2 serious and 3 minor injuries were reported in this group during the 3 year period ending 31 December 2014.

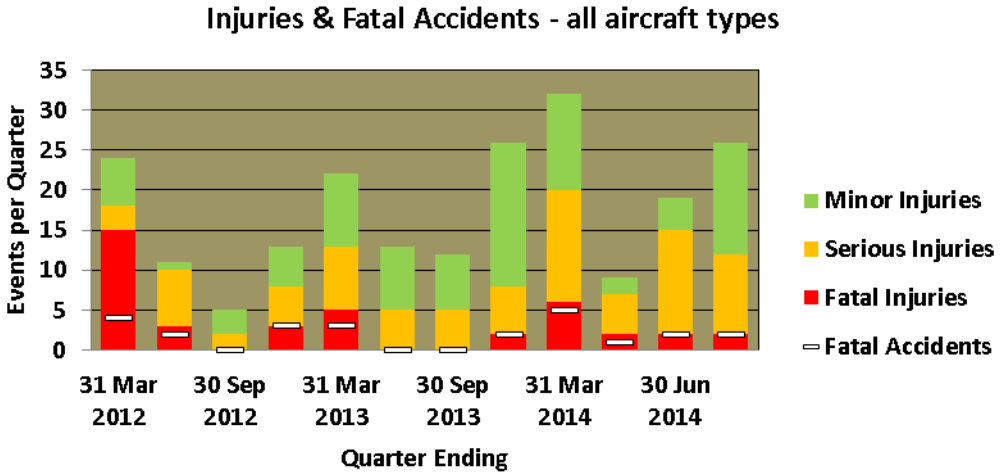


The outcome for Private Operations – Sport is well above the target level of $20.00 per seat hour and shows no significant trend. **11 fatal**, 42 serious and 39 minor injuries were reported in this group during the 3 year period ending 31 December 2014.

Note that this group includes hang gliders and parachutes used on private operations.

Injury Accidents

The following chart shows the number of injuries, broken down by severity (fatal, serious or minor) in each quarter of the 3-year period ending 31 December 2014. All aircraft types are included. The chart also shows the number of fatal accidents.



A breakdown of the same three years' data by Safety Outcome Target Group is shown in the table below.

Safety Target Group	Injuries			Fatal Accidents
	Fatal	Serious	Minor	
Airline Operations - Large Aeroplanes	0	3	12	0
Airline Operations - Medium Aeroplanes	0	0	0	0
Airline Operations - Small Aeroplanes	1	5	0	1
Airline Operations - Helicopter	3	5	9	3
Sport Transport	11	7	13	1
Other Commercial Operations - Aeroplane	2	6	1	1
Other Commercial Operations - Helicopter	1	3	5	1
Agricultural Operations - Aeroplane	1	4	1	1
Agricultural Operations - Helicopter	4	1	1	4
Private Operations - Aeroplane	1	5	5	1
Private Operations - Helicopter	3	2	3	2
Private Operations - Sport	11	42	39	8
Other	2	0	0	1

Yearly Comparison

The following table displays the number of fatalities for each safety target group for the year ending 31 December 2014, the previous year and the average of the three years before that.

Safety Outcome Target Group	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Airline Operations - Large Aeroplanes	**0**	0	0.00
Airline Operations - Medium Aeroplanes	**0**	0	0.00
Airline Operations - Small Aeroplanes	**1**	0	0.00
Airline Operations - Helicopter	**1**	2	0.00
Sport Transport	**0**	0	3.67
Other Commercial Operations - Aeroplane	**2**	0	3.67
Other Commercial Operations - Helicopter	**1**	0	2.33
Agricultural Operations - Aeroplane	**0**	0	0.33
Agricultural Operations - Helicopter	**2**	1	0.33
Private Operations - Aeroplane	**1**	0	0.67
Private Operations - Helicopter	**2**	0	0.67
Private Operations - Sport	**2**	2	4.00
Other	**0**	2	0.00
Total	**12**	**7**	**15.67**

Groups that showed increased numbers of fatalities for the period were:

Airline Operations Small Aeroplane
Other Commercial Aeroplane and Helicopter Operations,
Agricultural Helicopter Operations,
Private Aeroplane and Private Helicopter Operations.

The following group had a reduced number of fatalities relative to the previous period.

Airline Operations Helicopters

Flight Phase

The following table shows the flight phase recorded for accidents for the year ending 31 December 2014, the previous year and the average of the three prior years. The figures include all aircraft types.

Flight Phase	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Aerobatics	1	0	0.3
Agricultural Manoeuvres	1	2	3.0
Approach	9	5	5.3
Circuit	1	0	0.7
Climb	8	6	6.0
Cruise	12	14	9.0
Descent	3	3	4.0
Holding	0	0	0.0
Hover	1	5	3.3
Hover Taxi	0	2	0.3
Landing	42	47	36.7
Parked	0	5	3.7
Takeoff	20	16	16.7
Taxiing	4	3	3.7
Unknown	9	7	7.0
Total	111	115	99.7

The most common phase of flight during which accidents occurred in the year ending 31 December 2014 was the Landing phase (38%)

The most common event descriptor associated with Landing phase accidents during the year ending 31 December 2014 was 'Hard Landing' (13%)

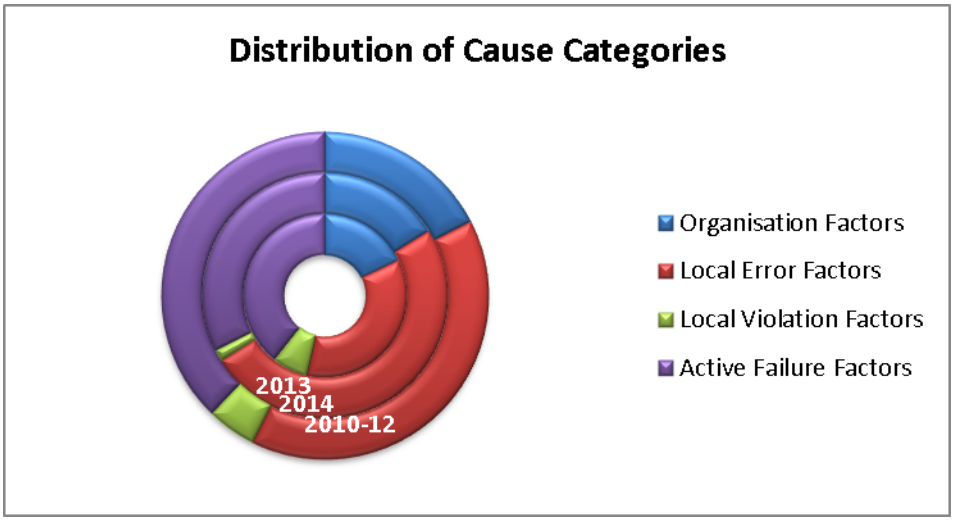
The most common cause (at 18.2%) recorded for Landing phase accidents during the year ending 31 December 2014 was 'Active Failure Factors - PRIMARILY "STRUCTURAL/MECHANICAL"'

This ratio of accident by flight phase is largely unchanged from previous years and reflects the fact that landing is the highest risk phase of flight.

Accident Causal Factors

Causal factors have been assigned to 21 (19%) of the 111 accidents that were reported as occurring during the year ending 31 December 2014. This compares with 29% for the same period in the previous year and an average of 62% over the preceding three years. In making this comparison it is important to remember that the assignment of causal factors is an outcome of an investigation and for the current period may not be completed in time for inclusion in this report

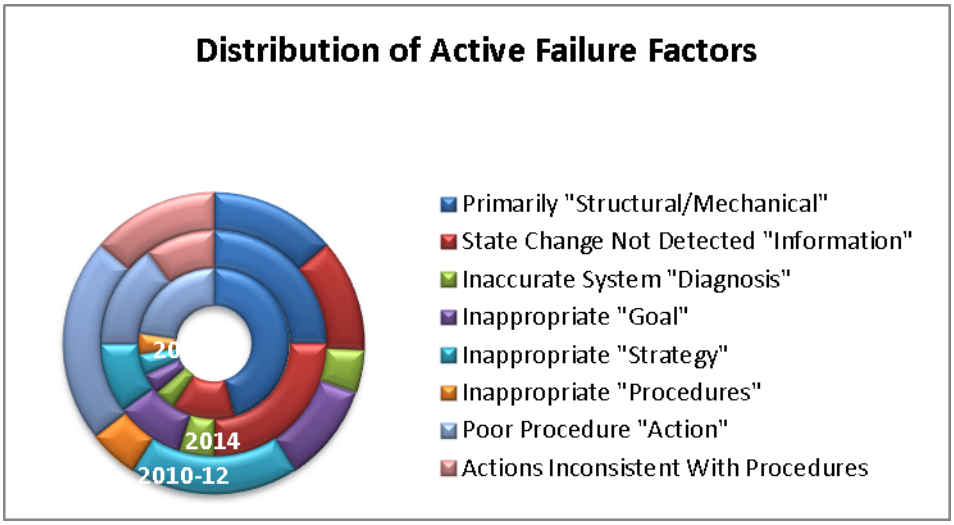
The following chart shows the distribution of cause categories (groupings of causal factors) recorded for accidents that occurred during the year ending 31 December 2014, the same period for the previous year and the average for the three years before that.



Active Failure Factors

The Active Failure cause category has been further analysed on the grounds that whatever precursor latent failures may exist and be discovered during a subsequent investigation, at least one 'Unsafe Act' (e.g. Omitted checklist item, Exceeded ability etc.) must occur for an accident to result. These unsafe acts are collectively grouped as Active Failure Factors.

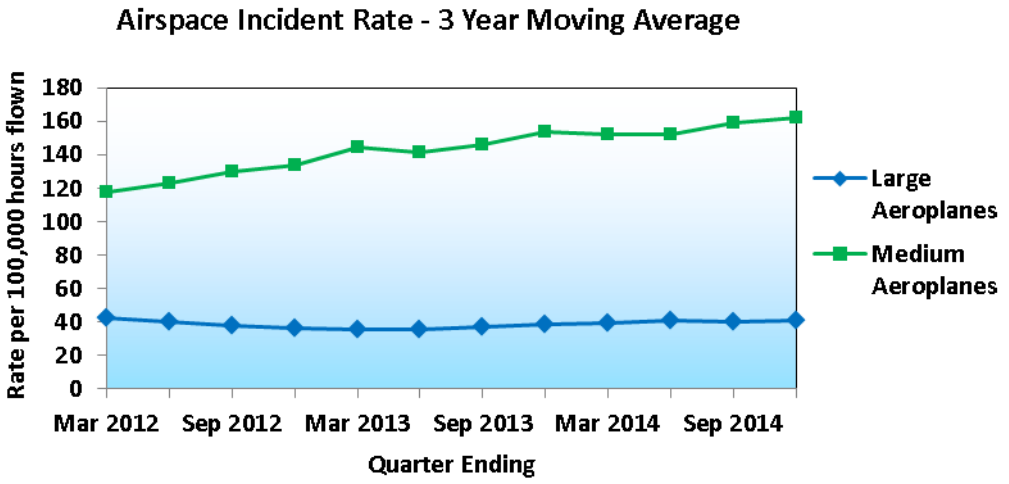
The following chart shows the distribution of Active Failure causes during the same periods as above.

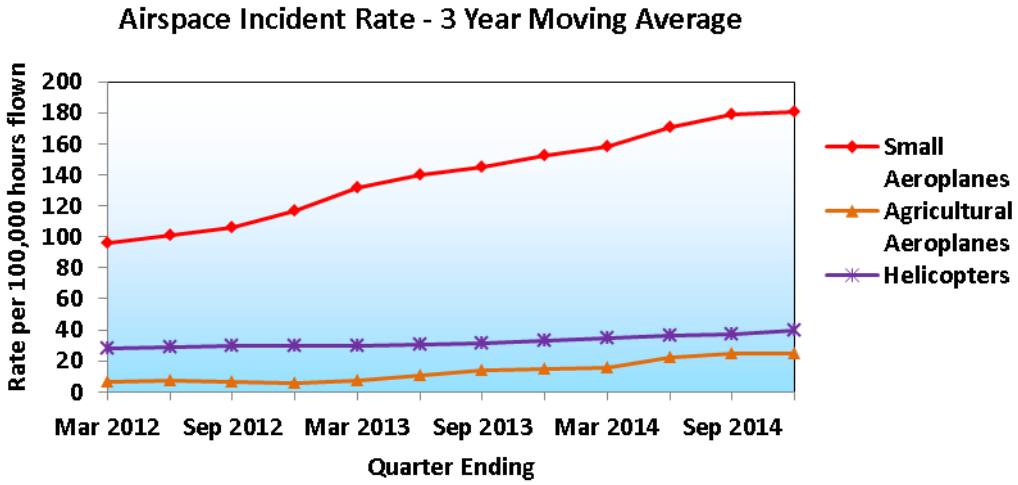


Airspace Incidents

The following graphs show the airspace incident reporting rates (incidents per 100,000 hours flown) three year moving average for the three-year period ending 31 December 2014 (excluding the Sport Aircraft category). The graphs do not differentiate between incidents that are pilot or ATS attributable.

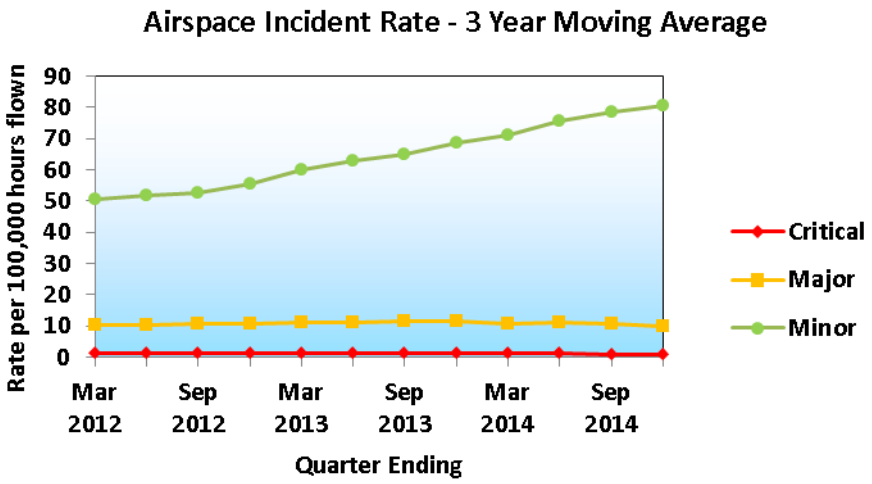
Breakdown by Aircraft Category





Aircraft Category	Straight Line Trend of 3 Year Moving Average
Large Aeroplanes	Not Significant
Medium Aeroplanes	Trending Up
Small Aeroplanes	Trending Up
Agricultural Aeroplanes	Trending Up
Helicopters	Trending Up

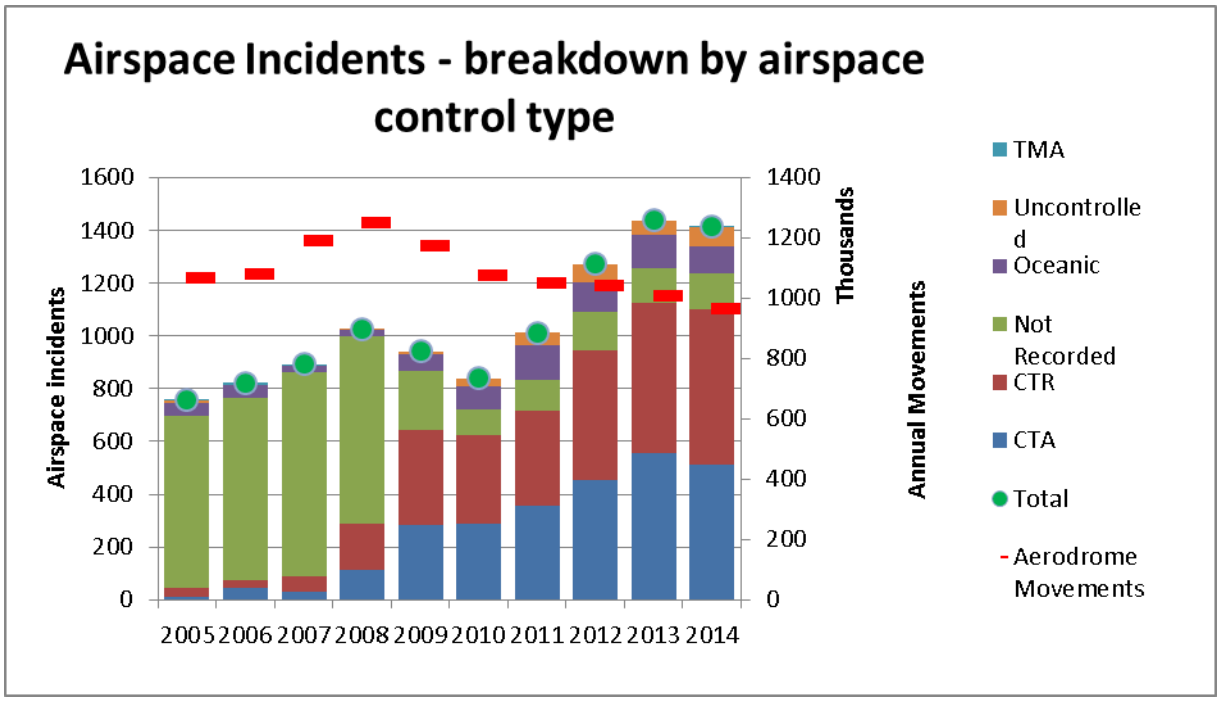
Breakdown by Severity



Severity	Straight Line Trend of 3 Year Moving Average
Critical	Trending Down
Major	Not Significant
Minor	Trending Up

The upward trend in minor airspace incidents is under investigation

Breakdown by Airspace Control type



Yearly Comparisons

By Aircraft Category

Minor Airspace Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	133	139	105.0
Medium Aeroplanes	61	76	66.0
Small Aeroplanes	488	466	292.7
Helicopters	81	65	42.3
Sport Aircraft	72	86	42.3
Agricultural Aeroplanes	14	11	1.7
Not Recorded	445	429	318.7
Total	1294	1272	868.7

Major Airspace Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	10	14	12.7
Medium Aeroplanes	3	10	9.3
Small Aeroplanes	44	62	64.0
Helicopters	12	15	11.0
Sport Aircraft	7	9	11.0
Agricultural Aeroplanes	0	1	0.3
Not Recorded	38	38	48.3
Total	114	149	156.7

Critical Airspace Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	0	0	0.3
Medium Aeroplanes	0	2	0.3
Small Aeroplanes	3	7	8.7
Helicopters	2	1	2.7
Sport Aircraft	0	2	1.3
Agricultural Aeroplanes	1	0	0.3
Not Recorded	0	4	2.0
Total	6	16	15.7

All Airspace Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	143	153	118.0
Medium Aeroplanes	64	88	75.7
Small Aeroplanes	535	535	365.3
Helicopters	95	81	56.0
Sport Aircraft	79	97	54.7
Agricultural Aeroplanes	15	12	2.3
Not Recorded	483	471	369.0
Total	1414	1437	1041.0

By Nearest Airways Monitored Aerodrome

All Airspace Incidents	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Hamilton	**193**	**243**	149.3
Not Reported	**152**	**180**	121.3
Other	**149**	**129**	133.3
Christchurch	**112**	**106**	72.7
Auckland	**108**	**133**	106.0
Palmerston North	**88**	**57**	38.0
Tauranga	**81**	**98**	55.0
Wellington	**74**	**88**	63.0
Queenstown	**69**	**53**	43.7
Dunedin	**58**	**45**	21.7
Nelson	**54**	**32**	39.3
Ohakea	**42**	**31**	31.7
Paraparaumu	**35**	**25**	27.3
Woodbourne	**35**	**25**	16.0
Taupo	**30**	**24**	24.3
Napier	**28**	**33**	17.7
Rotorua	**28**	**47**	33.7
New Plymouth	**23**	**31**	18.7
Gisborne	**21**	**24**	10.7
Whenuapai	**17**	**18**	8.7
Invercargill	**8**	**5**	6.3
Milford Sound	**6**	**3**	1.0
Whakatane	**3**	**7**	1.7
Total	**1414**	**1437**	**1041.0**

The relative positions of Hamilton and Auckland compared with their movements (page 24) is likely to reflect the involvement of training aircraft in airspace occurrences as Hamilton is reporting a much greater number of airspace occurrences despite comparable aircraft movements.

Airspace Incident Attributability

Introduction

Airspace incidents are categorised as

- ATS or
- Pilot or
- ATS and pilot attributable.

The categorisation is based on the result of an investigation if available otherwise it is based on the descriptor assignment.

For the purposes of this analysis airspace incidents have been divided into those that have been identified to have an ATS-attributable element and those that have a pilot-attributable element. Accordingly there is some overlap in the number of occurrences reported where both ATS and pilot elements are involved.

Note: ATS-attributable airspace occurrences include those that are attributable to both New Zealand and external ATS organisations. External ATS organisations are included where information coordination problems have arisen or where a New Zealand registered aircraft has reported a conflict in non-NZ airspace.

Descriptors

Occurrence descriptors have been established for 1395 of the 1414 reported airspace incidents in the period Year Ending 31 December 2014. This means that most but not quite all airspace incidents are accounted for in the following attributability tables and graphs.

Note: each airspace incident may have more than one airspace incident descriptor.

Yearly Comparison

The following table shows the assignment of airspace occurrence descriptors that are associated with airspace incidents that have an ATS-attributable component.

Descriptor	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
ATS clearance/instruction deficiency	122	110	63.0
ATS coordination deficiency	154	114	86.7
ATS flight information deficiency	21	14	12.3
ATS flight planning system deficiency	21	17	17.7
Total	318	255	180

The following table shows the assignment of airspace occurrence descriptors that are associated with airspace incidents that have a pilot-attributable component.

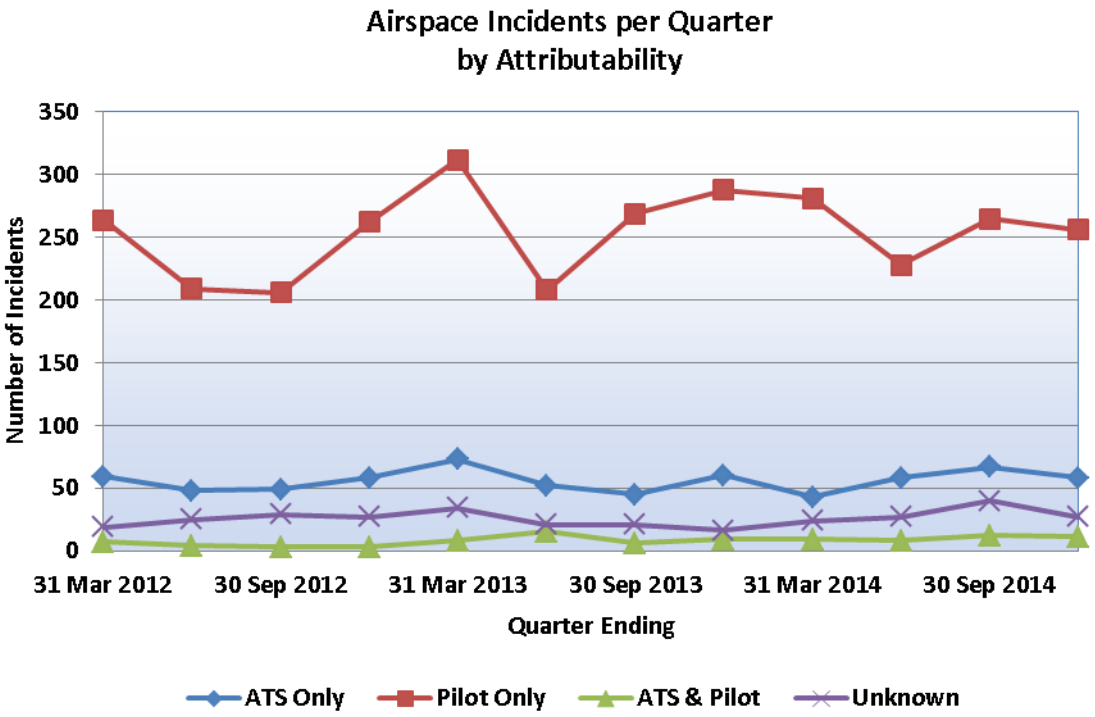
Descriptor	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Breach of other clearance	524	356	202.0
Flight assist	1	2	4.7
Pilot flight planning deficiency	28	30	21.7
Pilot position reporting deficiency	128	102	67.7
Pilot readback deficiency	10	7	3.7
Unauth airspace incursion	499	396	298.3
Unauth altitude penetration	206	190	106.7
Total	1396	1083	476

The following table shows the assignment of airspace occurrence descriptors that could be associated with any airspace incident.

Descriptor	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Controller/pilot datalink communications	1	0	0.7
Loss of separation	72	64	48.0
Near collision	12	17	29.7
Other	118	35	37.0
Reduced vertical separation minima	0	2	1.3
Short term conflict alert	9	4	4.0
Traffic collision avoidance system	77	76	92.0
Total	289	198	134

Trend

The following graph shows the quarterly numbers of airspace incident reports and their attributability for the three year period ending 30 June 2014.



Quarterly ASP incident report numbers show no significant 3 year trend for incidents attributable to pilot only and to ATS only. Incidents attributable to ATS or Pilot and those where attributability is unknown show an upward trend

The number of "unknown" attributable airspace incidents reflects difficulties with coding of reports received by the CAA. Note that there is often a time delay between incidents occurring, being investigated, and attributability being assigned to either ATS or Pilot.

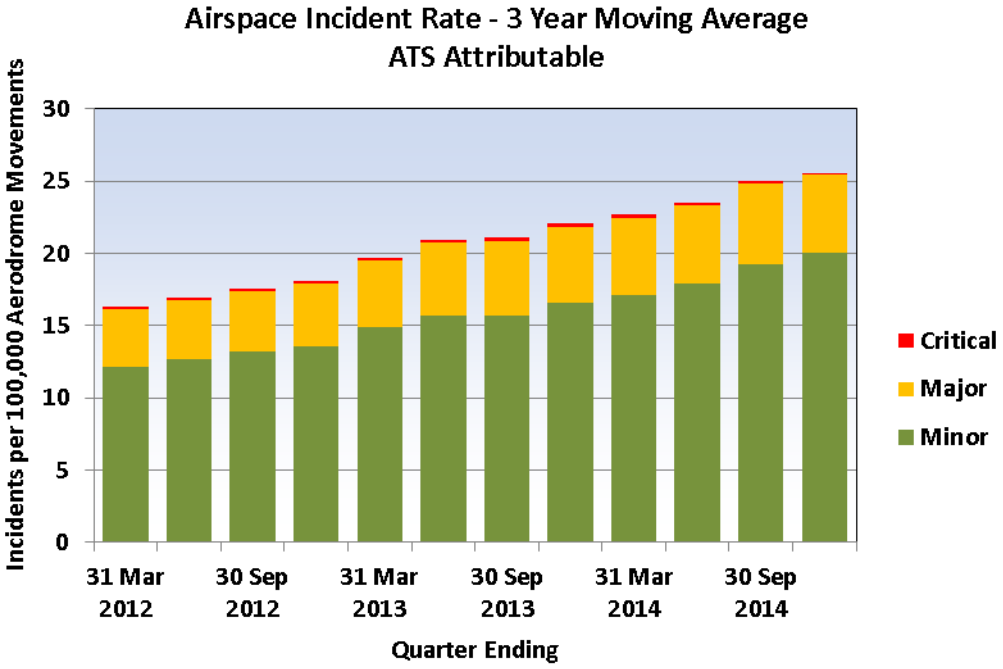
The following table summarises the attributability of airspace incidents.

Attributability	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Pilot Only	1030	1077	766.7
ATS Only	226	230	180.3
Unknown	118	92	84.0
ATS & Pilot	40	38	10.0
Total	1414	1437	1041

ATS Attributable ASP Incidents

Occurrence Trend

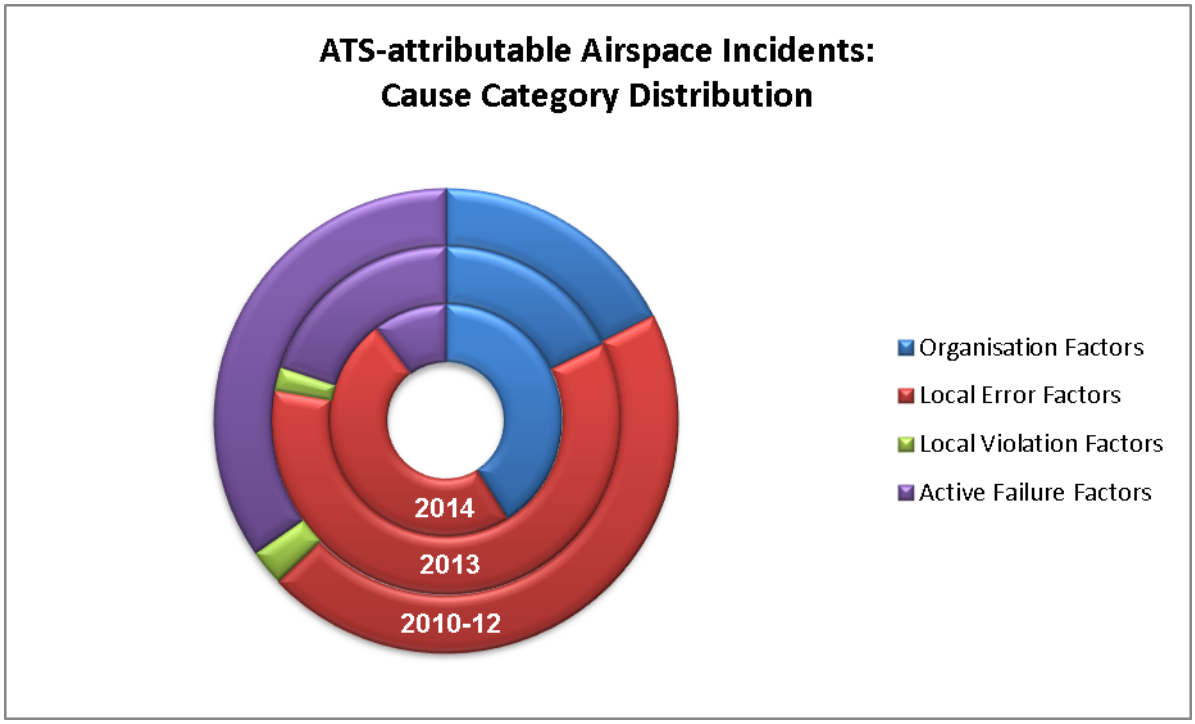
The following chart shows the airspace incident reporting rate for Air Traffic Service (ATS)-attributable incidents. The values are incidents per 100,000 reported aircraft movements, 12 month moving average for the 3 year period ending 31 December 2014.



The ATS-attributable airspace incident rate over the three year period is clearly trending upwards.

Causal Factors

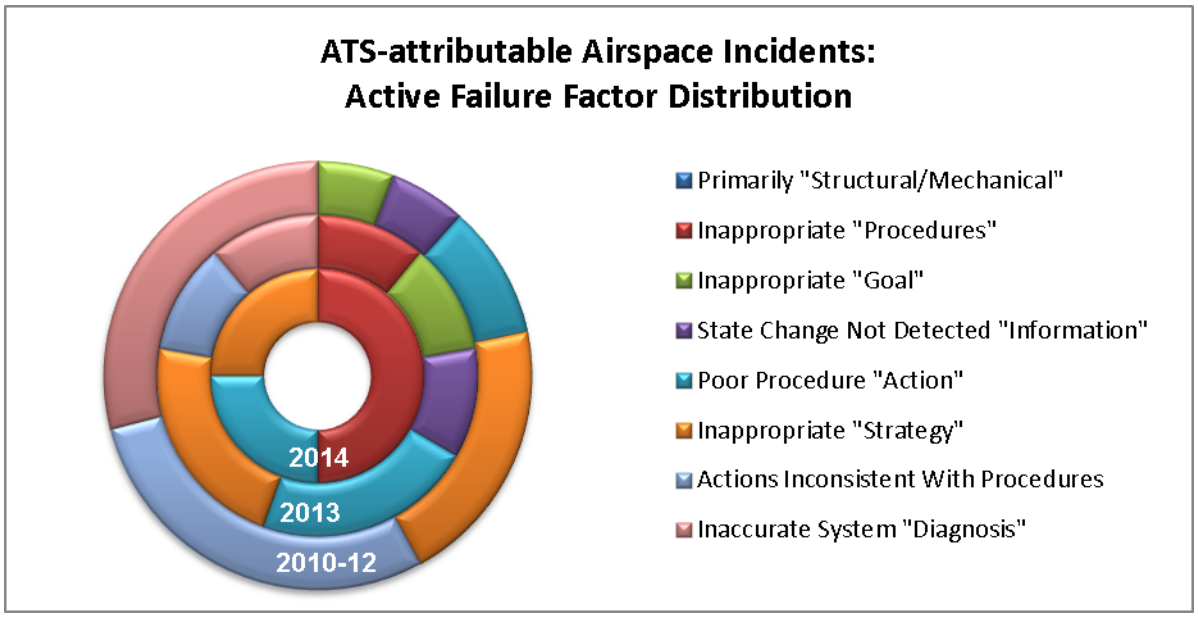
The following chart shows the distribution of cause categories (groupings of causal factors) recorded for ATS-attributable airspace incidents that occurred during the year ending 31 December 2014, the same period for the previous year and the average for the three years before that.



Active Failure Factors

The Active Failure cause category has been further analysed on the grounds that whatever precursor latent failures may exist and be discovered during a subsequent investigation, at least one 'Unsafe Act' (e.g. Omitted checklist item, Exceeded ability etc.) must occur for an accident to result. These unsafe acts are collectively grouped as Active Failure Factors.

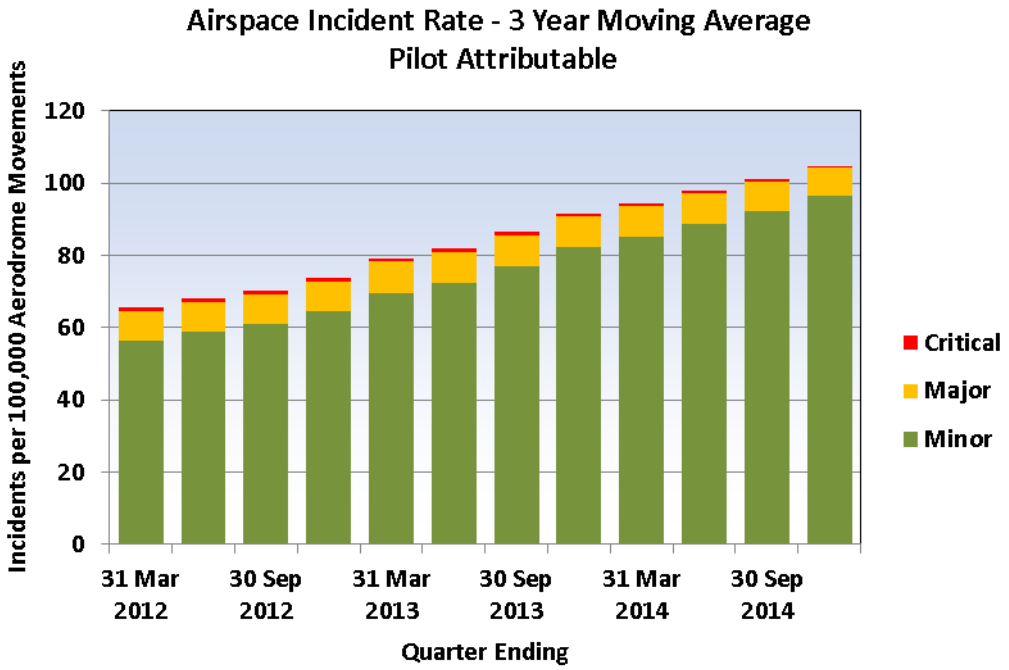
The following chart shows the distribution of Active Failure causes during the same periods as above.


ATS-attributable Airspace Incidents:
Active Failure Factor Distribution
2014
2013
2010-12
Primarily "Structural/Mechanical"
Inappropriate "Procedures"
Inappropriate "Goal"
State Change Not Detected "Information"
Poor Procedure "Action"
Inappropriate "Strategy"
Actions Inconsistent With Procedures
Inaccurate System "Diagnosis"

Pilot Attributable ASP Incidents

Occurrence Trend

The following graph shows the airspace incident reporting rate for pilot attributable incidents. The values are incidents per 100,000 reported aircraft movements, 12 month moving average for the three-year period ending 31 December 2014.

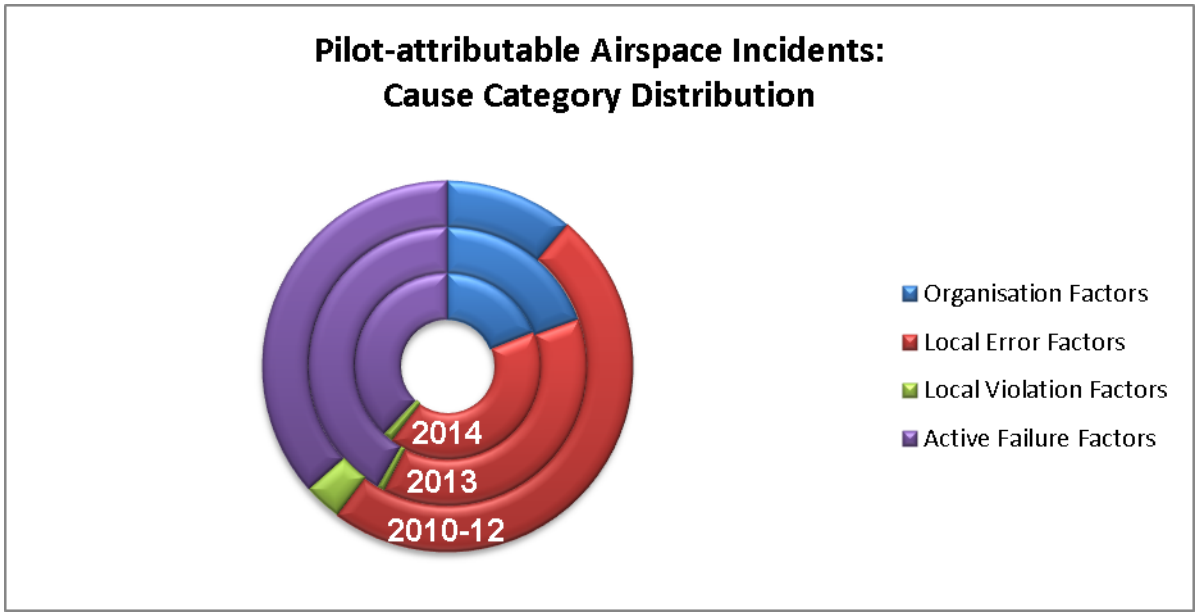


The Pilot attributable airspace incident rate over the three year period is trending upwards.

In early 2011 a system of follow-up letters was introduced for operators of aircraft who didn't report Airspace incidents that were reported by the ATS provider. Since the introduction of this system there has been a noticeable increase in the number of Airspace incidents that are reported by both parties.

Causal Factors

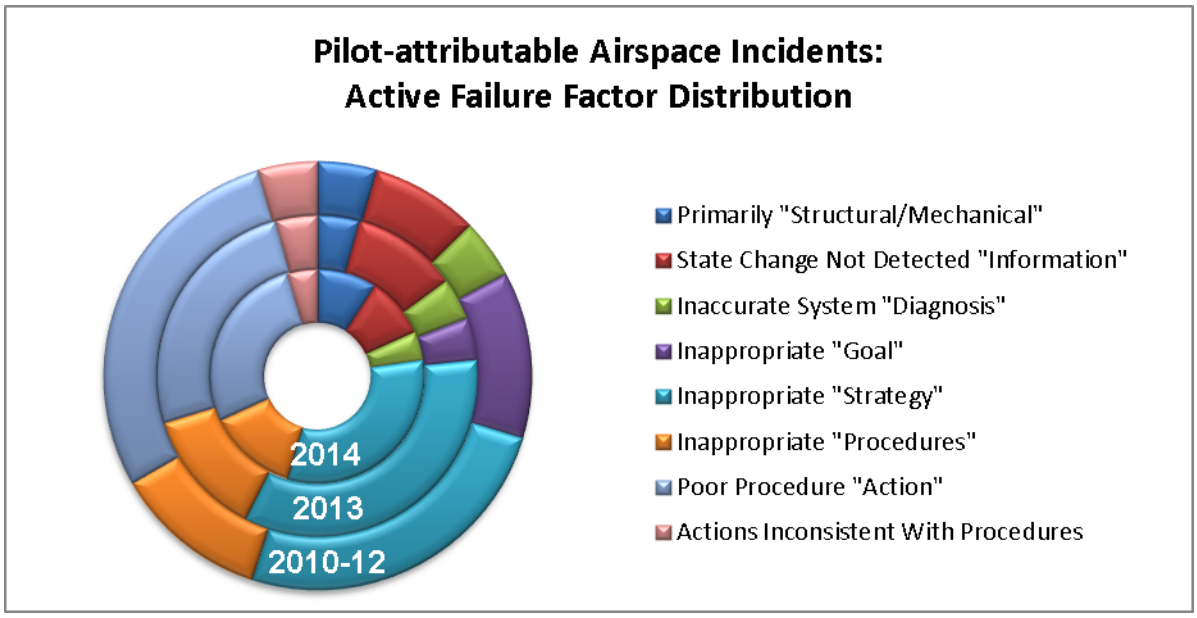
The following charts show the distribution of cause categories (groupings of causal factors) recorded for Pilot attributable airspace incidents that occurred during the year ending 31 December 2014, the same period for the previous year and the average for the three years before that.



Active Failure Factors

The Active Failure cause category has been further analysed on the grounds that whatever precursor latent failures may exist and be discovered during a subsequent investigation, at least one 'Unsafe Act' (e.g. Omitted checklist item, Exceeded ability etc.) must occur for an incident to result. These unsafe acts are collectively grouped as Active Failure Factors.

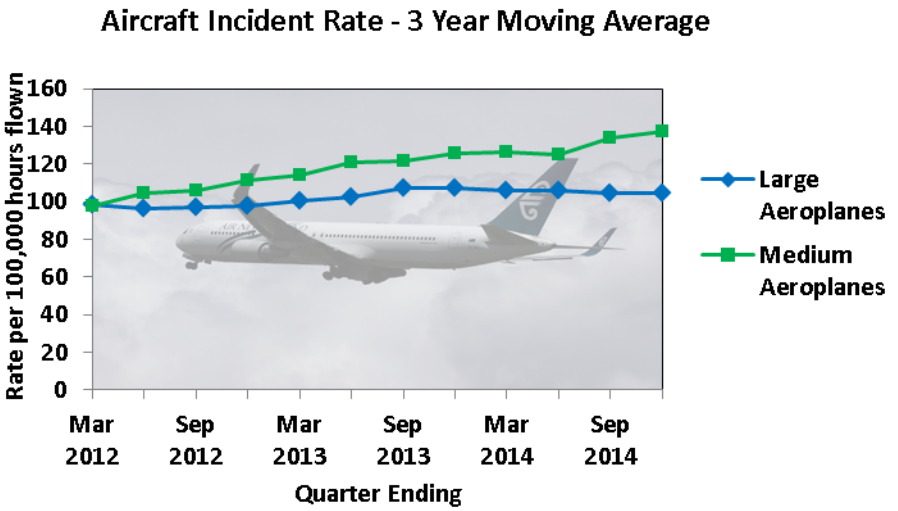
The following chart shows the distribution of Active Failure causes during the same periods as above.

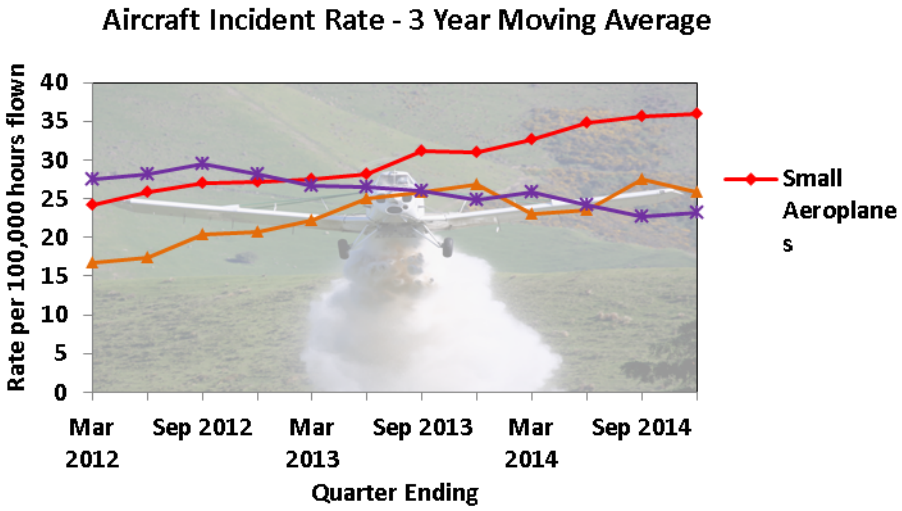


Operational (Aircraft) Incidents

The following graphs show the reported operational incident rates (incidents per 100,000 hours flown) three year moving average for the three-year period ending 31 December 2014.

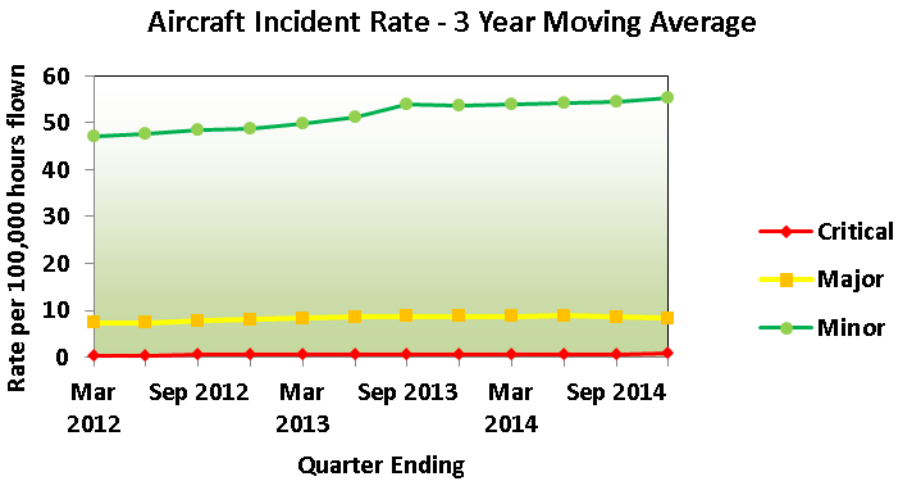
Breakdown by Aircraft Category





Aircraft Category	Straight Line Trend of 3 Year Moving Average
Large Aeroplanes	Not Significant
Medium Aeroplanes	Trending Up
Small Aeroplanes	Trending Up
Agricultural Aeroplanes	Trending Up
Helicopters	Trending Down

Breakdown by Severity



Severity	Straight Line Trend of 3 Year Moving Average
Critical	Trending Up
Major	Not Significant
Minor	Not Significant

Yearly Comparisons

Critical Operational Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	0	1	0.3
Medium Aeroplanes	0	0	0.7
Small Aeroplanes	2	1	1.0
Helicopters	3	5	1.7
Sport Aircraft	0	0	0.0
Agricultural Aeroplanes	1	0	1.0
Not Recorded	1	4	0.3
Total	7	11	5.0

Major Operational Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	18	35	20.0
Medium Aeroplanes	1	7	7.7
Small Aeroplanes	15	26	23.0
Helicopters	15	14	18.0
Sport Aircraft	11	11	8.0
Agricultural Aeroplanes	2	3	3.0
Not Recorded	9	12	15.3
Total	71	108	95.0

Minor Operational Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	307	363	297.3
Medium Aeroplanes	49	77	54.7
Small Aeroplanes	85	65	61.0
Helicopters	25	25	34.0
Sport Aircraft	47	45	14.0
Agricultural Aeroplanes	6	9	4.0
Not Recorded	138	102	155.0
Total	657	686	620.0

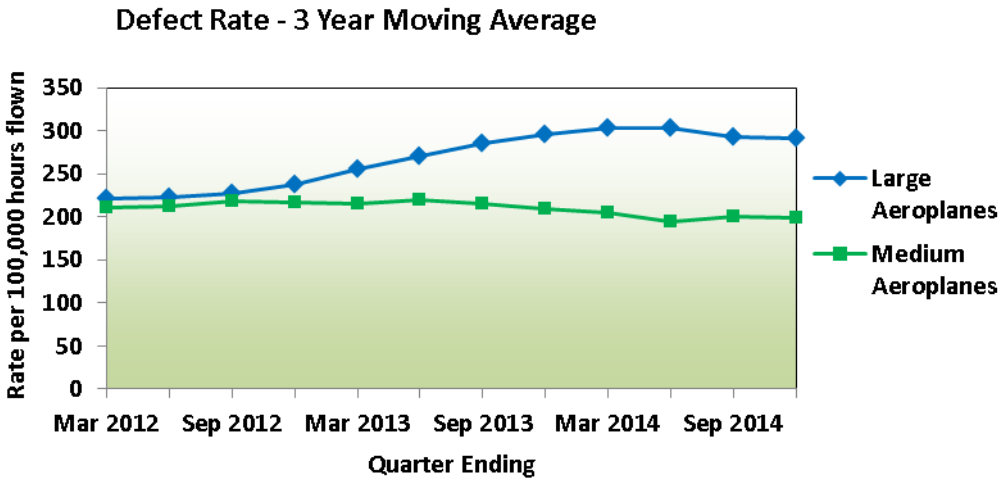
All Operational Incidents

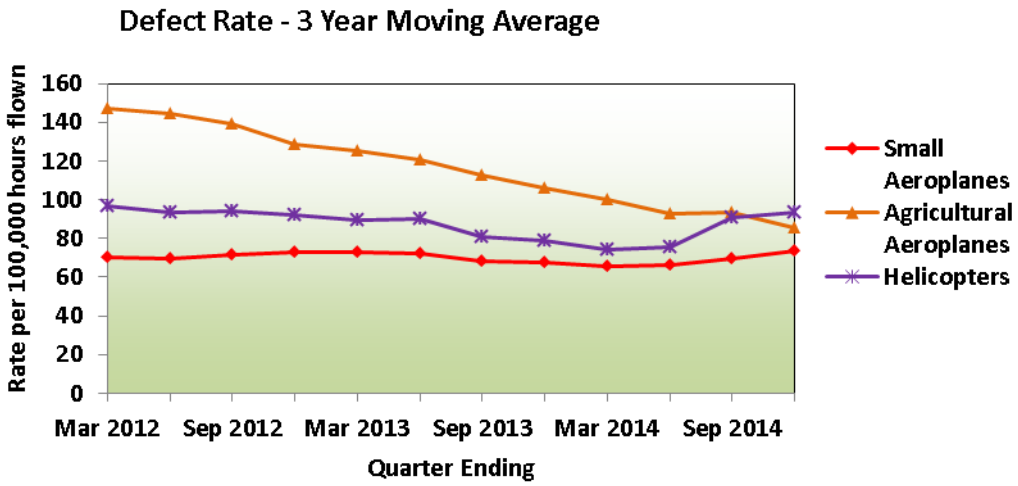
Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	325	399	317.7
Medium Aeroplanes	50	84	63.0
Small Aeroplanes	102	92	85.0
Helicopters	43	44	53.7
Sport Aircraft	58	56	22.0
Agricultural Aeroplanes	9	12	8.0
Not Recorded	148	118	170.7
Total	735	805	720.0

Defect Incidents

The following graphs show the aircraft defect incident reporting rates (incidents reported per 100,000 hours flown) three year moving average for the three-year period ending 31 December 2014.

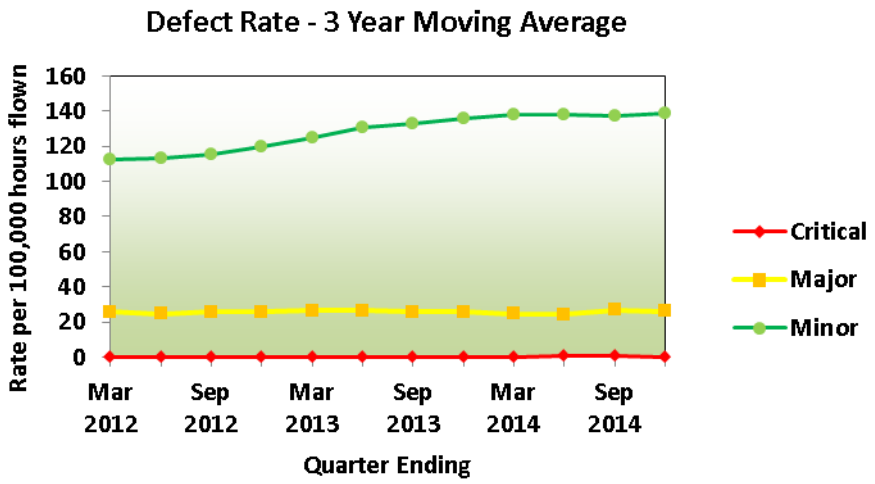
Breakdown by Aircraft Category





Aircraft Category	Straight Line Trend of 3 Year Moving Average
Large Aeroplanes	Trending Up
Medium Aeroplanes	Not Significant
Small Aeroplanes	Not Significant
Agricultural Aeroplanes	Trending Down
Helicopters	Not Significant

Breakdown by Severity



Severity	Straight Line Trend of 3 Year Moving Average
Critical	Trending Up
Major	Not Significant
Minor	Trending Up

Yearly Comparisons

Critical Defect Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	0	0	0.3
Medium Aeroplanes	0	0	0.7
Small Aeroplanes	1	1	0.3
Helicopters	1	0	0.3
Sport Aircraft	0	0	0.3
Agricultural Aeroplanes	0	0	1.0
Not Recorded	0	0	0.0
Total	2	1	3.0

Major Defect Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	37	93	93.3
Medium Aeroplanes	15	27	26.0
Small Aeroplanes	30	62	64.3
Helicopters	138	63	37.0
Sport Aircraft	6	12	13.7
Agricultural Aeroplanes	5	7	16.0
Not Recorded	23	11	9.7
Total	254	275	260.0

Minor Defect Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	737	1176	679.3
Medium Aeroplanes	98	57	96.0
Small Aeroplanes	202	131	163.7
Helicopters	127	101	137.7
Sport Aircraft	19	14	18.0
Agricultural Aeroplanes	28	21	33.0
Not Recorded	49	55	40.0
Total	1260	1555	1167.7

All Defect Incidents

Aircraft Category	Year Ending Dec 2014	Year Ending Dec 2013	Annual Average Jan 2010-Dec 2013
Large Aeroplanes	774	1269	773.0
Medium Aeroplanes	113	84	122.7
Small Aeroplanes	233	194	228.3
Helicopters	266	164	175.0
Sport Aircraft	25	26	32.0
Agricultural Aeroplanes	33	28	50.0
Not Recorded	72	66	49.7
Total	1516	1831	1430.7

ATA Chapters

Defect Incidents reported as occurring during the year ending 31 December 2015 were associated with the following ATA component code chapters.

Large Aeroplanes

Chapter 27 (AEROPLANE FLIGHT CONTROL - GENERAL) was the most common with 127 defects, up from 76 in the previous period.

The next most common chapter was Chapter 21 (AIR CONDITIONING - GENERAL) with 105 defects, down from 181 in the previous period.

Medium Aeroplanes

Chapter 34 (FLIGHT NAVIGATION SYSTEMS - GENERAL) was the most common with 20 defects, up from 9 in the previous period.

The next most common chapter was Chapter 32 (LANDING GEAR (LG) - GENERAL) with 16 defects, up from 12 in the previous period.

Small Aeroplanes

Chapter 73 (POWERPLANT FUEL SYSTEM - GENERAL) was the most common with 39 defects, up from 13 in the previous period.

The next most common chapter was Chapter 32 (LANDING GEAR (LG) - GENERAL) with 30 defects, up from 24 in the previous period.

Agricultural Aeroplanes

Chapter 32 (LANDING GEAR (LG) - GENERAL) was the most common with 9 defects, up from 5 in the previous period.

The next most common chapter was Chapter 73 (POWERPLANT FUEL SYSTEM - GENERAL) with 8 defects, up from 1 in the previous period.

Helicopters

Chapter 73 (POWERPLANT FUEL SYSTEM - GENERAL) was the most common with 94 defects, up from 2 in the previous period.

The next most common chapter was Chapter 28 (FUEL SYSTEM - GENERAL) with 41 defects, up from 5 in the previous period.

Sport Aircraft

Chapter 32 (LANDING GEAR (LG) - GENERAL) was the most common with 4 defects, up from 3 in the previous period.

The next most common chapter was Chapter 25 (AIRCRAFT FURNISHING - GENERAL) with 3 defects, up from 0 in the previous period.

The next most common chapter was Chapter 55 (Stabilisers - General) with 3 defects, up from 0 in the previous period.

Defect Incident Rates

Summary of Defect Rate Standard

Three levels have been defined for categorising quarterly defect rates. The current levels are:

Normal – less than 4.25 defect incidents per 1,000 hours flown.

Alert – between 4.25 and 6 defect incidents per 1,000 hours flown.

High – above 6 defect incidents per 1,000 hours flown.

The current levels were set in July 2002. They are based on data from the three years to 30 June 2002, excluding B747-200 aircraft since that type was removed from service during the quarter 1 July to 30 September 1999.

CAA Actions

The following table shows how the current values of defect rates will be used to determine CAA action.

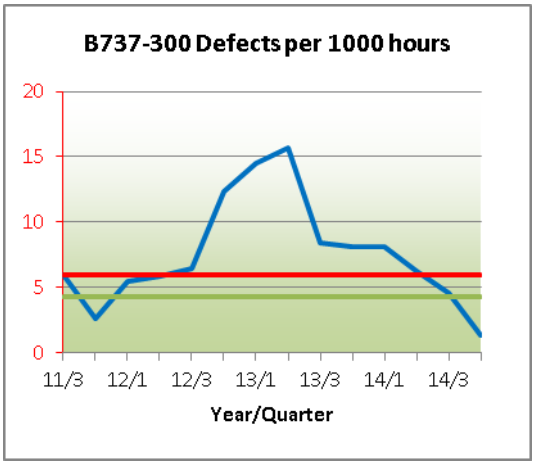
Defect Rate	CAA Action
Normal	Monitor
Alert	Notify appropriate General Manager
High	Notify appropriate General Manager

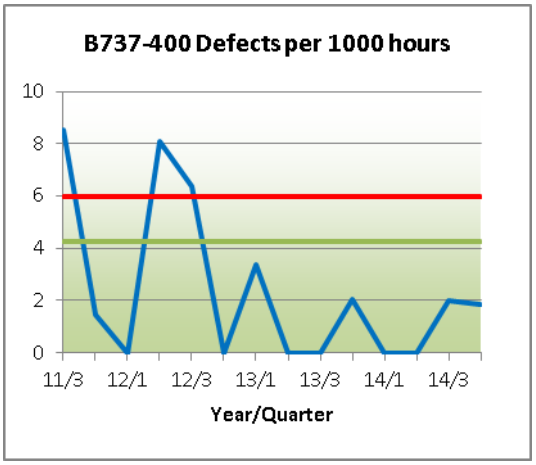
The timing of defect reports is often considerably later than what is mandated by Rule Part 12 and likewise a small number of operators of large and medium aeroplanes are persistently late with their hours and flights data returns. As a result the last two quarters of following defect rate graphs are based on forecasts of hours flown and must be interpreted with caution.

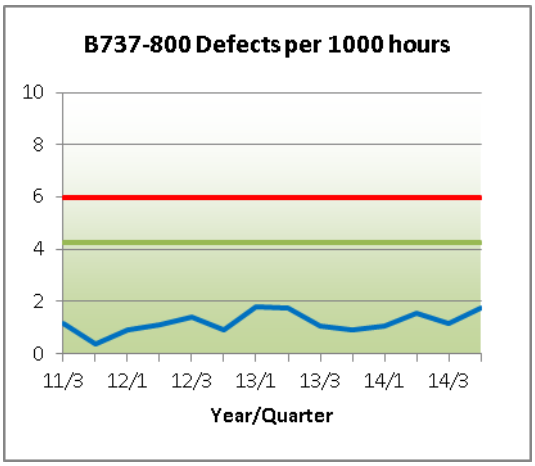
Analysis

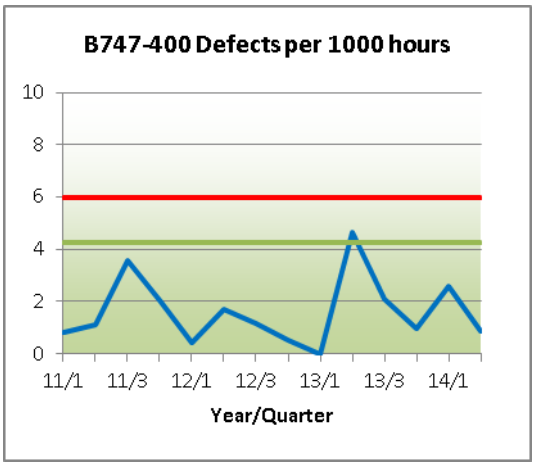
The top line on each graph shows the High defect rate. The next line shows the Alert defect rate. The Manager Airline Maintenance is notified of all high and alert rates on a quarterly basis.

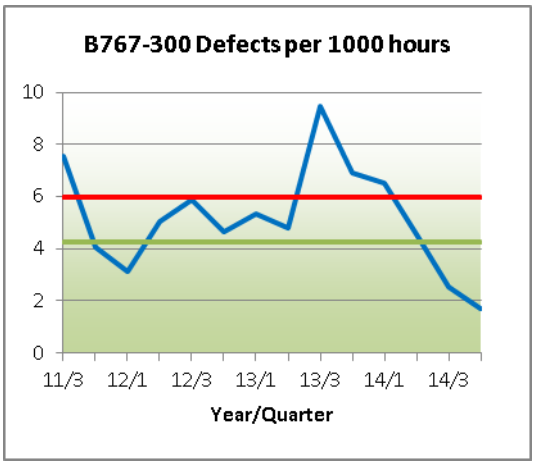
Large Aeroplanes

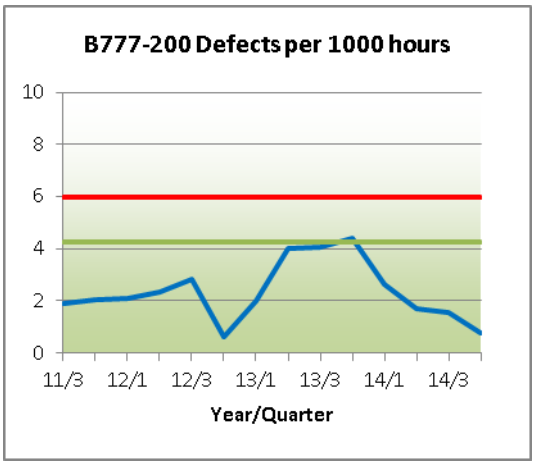


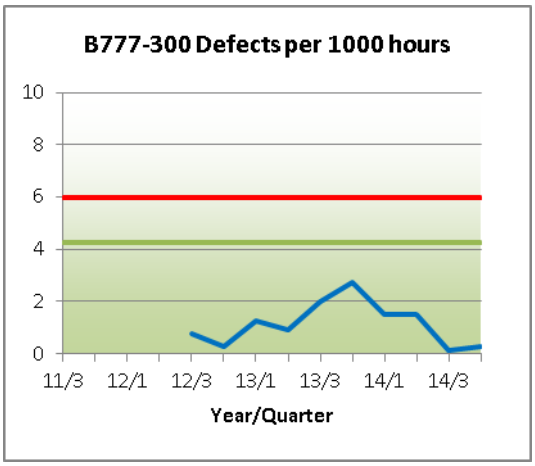


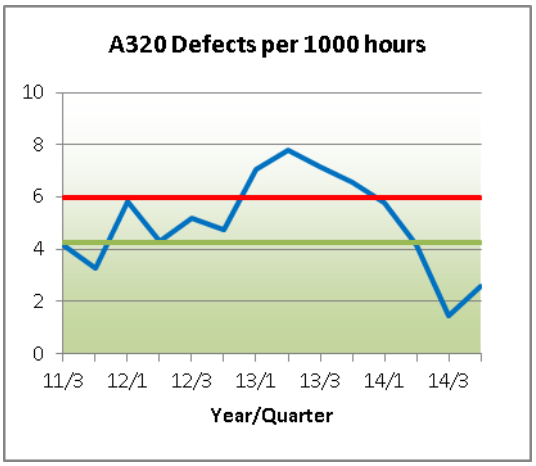


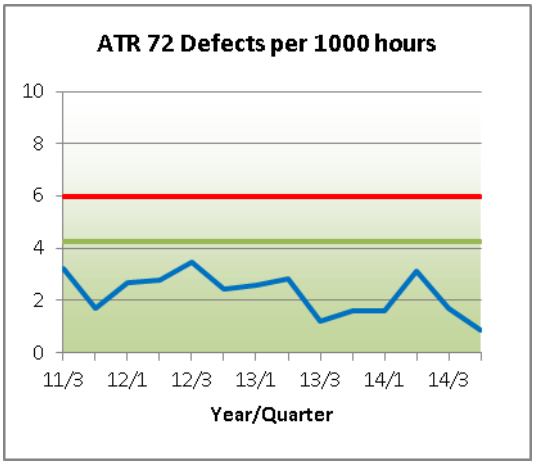


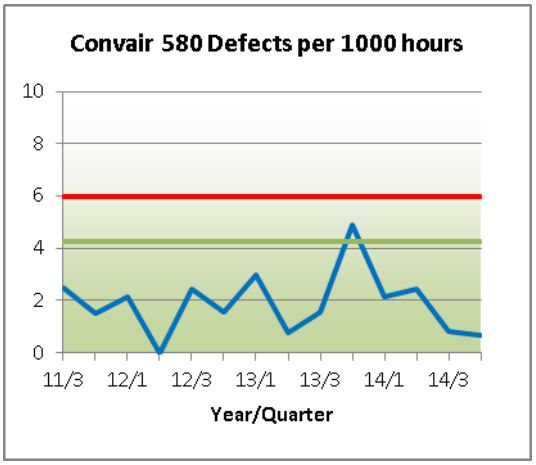


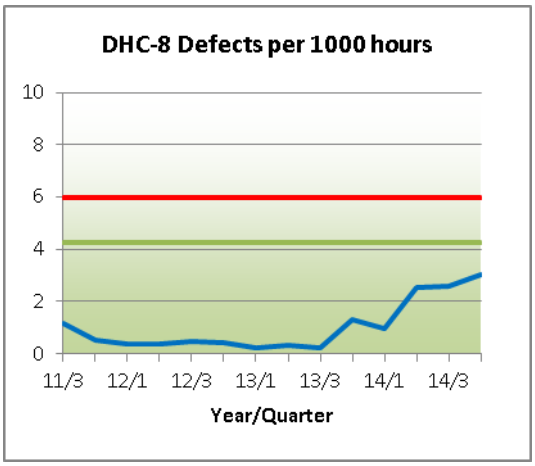



B777-300 Defects per 1000 hours
10
8
6
4
2
0
11/3
12/1
12/3
13/1
13/3
14/1
14/3
Year/Quarter

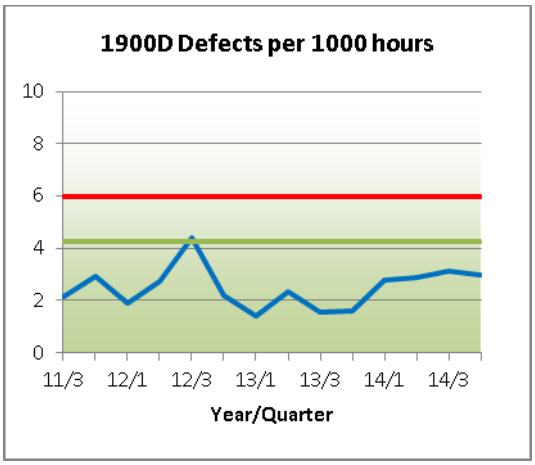

A320 Defects per 1000 hours
10
8
6
4
2
0
11/3
12/1
12/3
13/1
13/3
14/1
14/3
Year/Quarter

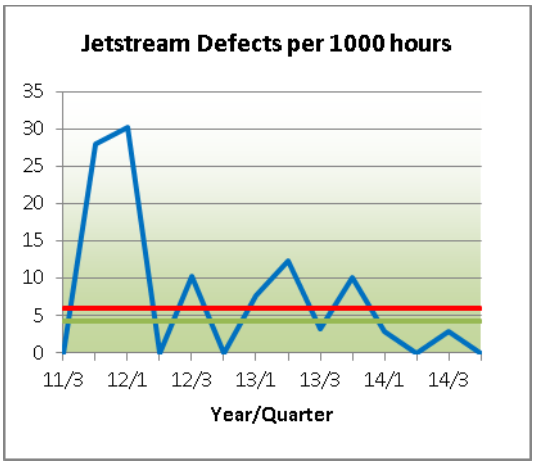

ATR 72 Defects per 1000 hours
10
8
6
4
2
0
11/3
12/1
12/3
13/1
13/3
14/1
14/3
Year/Quarter

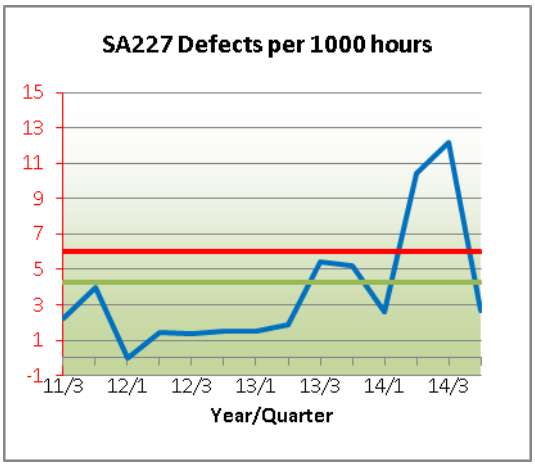

Convair 580 Defects per 1000 hours
10
8
6
4
2
0
11/3
12/1
12/3
13/1
13/3
14/1
14/3
Year/Quarter


DHC-8 Defects per 1000 hours
10
8
6
4
2
0
11/3
12/1
12/3
13/1
13/3
14/1
14/3
Year/Quarter

Medium Aeroplanes







Bird Incident Rates

Bird occurrence reporting rates are measured quarterly by aerodrome. This is achieved by querying the database for the number of bird hazard incidents reported at aerodromes by quarter. The results of this query are then divided by the aircraft movements at each aerodrome and multiplied by 10,000 to give incidents per 10,000 aircraft movements. Aircraft movements at aerodromes are obtained from the ACNZ, and, where available, from individual airport companies.

12-Month Moving Average Strike Rate

Incidents are categorised as strikes or near-strikes depending on whether or not actual contact occurred between the aircraft and one or more birds.

The following table shows the 12-month moving average **strike** rates for identified aerodromes for each quarter of the three year period ending 31 March 2015.

	Quarter											
Aerodrome	**12/2**	**12/3**	**12/4**	**13/1**	**13/2**	**13/3**	**13/4**	**14/1**	**14/2**	**14/3**	**14/4**	**15/1**
Chatham Islands	0.0	0.0	0.0	0.0	0.0	10.0	10.0	10.0	20.0	20.0	30.0	30.0
Manapouri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.5
Westport	14.5	14.5	14.5	4.8	4.8	4.8	4.8	4.8	9.7	4.8	9.7	14.5
Invercargill	3.8	1.9	2.5	3.8	3.6	3.4	2.2	2.3	6.5	10.4	12.5	12.8
Napier	9.3	11.9	8.7	11.8	11.7	9.0	9.4	6.2	7.1	8.1	10.6	11.9
Gisborne	7.0	7.4	7.1	7.5	7.2	7.7	6.8	5.8	7.0	9.1	11.3	10.5
Whenuapai	14.9	14.2	12.1	7.1	6.6	5.2	5.2	8.8	8.2	8.4	11.4	8.5
Kerikeri	7.5	8.8	10.0	10.0	13.8	10.0	8.8	10.0	8.8	10.0	10.0	7.5
Woodbourne	4.3	4.4	5.3	7.2	10.4	9.5	8.7	7.4	4.7	5.2	5.9	7.3
New Plymouth	3.2	3.3	3.9	5.0	6.8	6.9	6.4	3.8	1.7	3.0	4.6	6.6
Ohakea	2.9	2.5	2.6	3.7	2.2	4.0	3.8	3.9	6.1	5.3	5.8	5.6
Wanganui	2.1	2.6	3.6	3.2	6.7	7.4	5.6	5.5	3.4	3.2	2.8	5.2
Nelson	2.4	3.0	3.1	4.8	5.6	4.3	3.9	3.7	3.1	4.1	4.3	5.0
Whakatane	3.3	2.5	2.5	4.2	3.3	5.0	5.0	4.2	5.8	4.2	5.8	5.0
Rotorua	2.6	2.7	2.7	4.4	6.3	6.6	6.2	6.1	4.7	5.9	6.0	4.5
Dunedin	5.3	4.4	5.1	4.1	6.0	7.5	6.2	8.1	6.3	5.3	4.8	4.0
Wellington	3.0	3.7	3.3	3.2	3.0	2.7	2.6	2.9	2.4	2.2	3.4	3.8
Palmerston North	2.8	3.8	4.5	4.5	5.1	5.2	5.7	6.8	4.7	4.4	3.6	3.4
Christchurch	3.9	4.1	3.7	3.7	3.3	2.9	3.2	3.6	3.4	3.3	3.2	3.2
Tauranga	1.9	2.2	2.5	2.3	2.0	2.3	2.8	3.1	3.4	3.2	2.7	3.0
Queenstown	3.4	4.8	5.5	5.4	4.3	3.3	2.3	2.3	2.3	2.5	3.1	2.9
Auckland	3.2	2.9	2.3	2.4	3.3	3.4	3.4	2.9	2.0	2.3	2.2	2.5
Paraparaumu	1.0	0.9	1.8	1.4	2.5	3.0	2.6	2.7	2.5	2.1	1.6	1.6
Whangarei	6.8	5.3	4.5	2.3	3.8	6.8	7.5	7.5	5.3	1.5	1.5	1.5
Hamilton	1.2	1.2	1.4	1.4	1.2	1.0	1.3	1.3	1.7	1.6	1.1	1.3
Timaru	2.5	2.5	3.8	3.8	5.0	6.3	6.3	6.3	3.8	3.8	2.5	1.3
Taupo	2.3	2.3	2.7	1.2	1.7	2.1	1.3	1.3	1.7	0.9	0.9	0.9
Hokitika	3.6	3.6	3.6	0.0	0.0	3.6	3.5	3.0	2.7	0.0	0.0	0.0
Overall	3.5	3.6	3.6	3.7	4.0	3.9	3.8	3.8	3.5	3.6	3.8	4.0

Data with a pink background is based on CAA estimates of aircraft movements for the aerodrome because the CAA has either no data or incomplete data for that aerodrome.

Analysis

Each aerodrome is assigned a risk category based on the most recent 12 month average bird strike rate per 10,000 aircraft movements. These categories are:

Low	where the rate is less than 5 strikes per 10,000 movements
Medium	where the rate is not less than 5 strikes per 10,000 movements but less than 10 strikes per 10,000 movements
High	where the rate is not less than 10 strikes per 10,000 movements.

Each aerodrome is also assigned a trend category based on a straight line approximation to the 3 year history of bird strike rates. These categories are:

Trending down	where the 3 year decrease exceeds 20% of the average
Constant	where the 3 year change is between + and – 20% of the average
Trending up	where the 3 year increase exceeds 20% of the average

The CAA then determines what if any actions are required based on the combination of the above categories

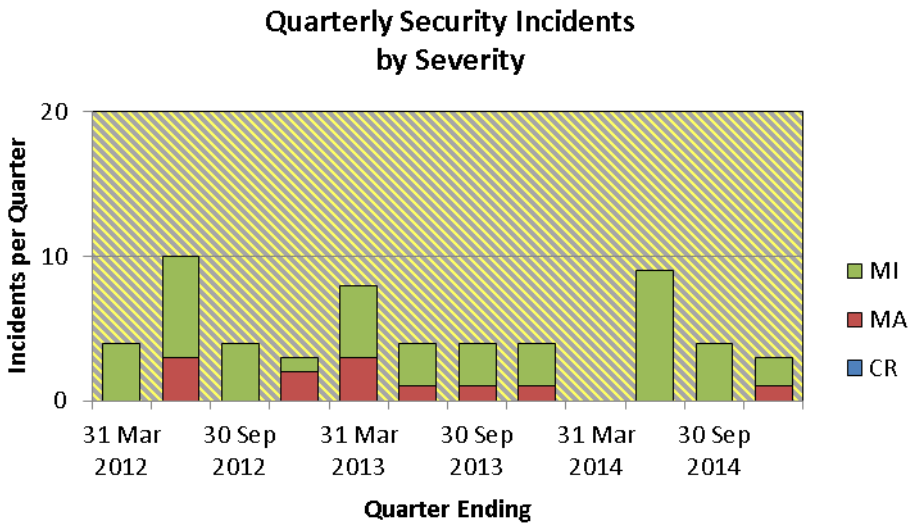
Details as at 31 March 2015 for individual aerodromes are shown in the following table.

Aerodrome	Risk Category	Trend
Auckland	Low	Downward
Chatham Islands	High	Upward
Christchurch	Low	Downward
Dunedin	Low	Constant
Gisborne	High	Upward
Hamilton	Low	Constant
Hokitika	Low	Downward
Invercargill	High	Upward
Kerikeri	Medium	Constant
Manapouri	High	Upward
Napier	High	Downward
Nelson	Low	Upward
New Plymouth	Medium	Upward
Ohakea	Medium	Upward
Palmerston North	Low	Constant
Paraparaumu	Low	Upward
Queenstown	Low	Downward
Rotorua	Low	Upward
Taupo	Low	Downward
Tauranga	Low	Upward
Timaru	Low	Constant
Wanganui	Medium	Upward
Wellington	Low	Constant
Westport	High	Downward
Whakatane	Medium	Upward
Whangarei	Low	Downward
Whenuapai	Medium	Downward
Woodbourne	Medium	Upward

Security Incidents

A security incident is defined as an incident that involves unlawful interference

The following chart shows the reported security incidents by quarter over the three year period ending 31 December 2014



Note: none of the incidents reported as occurring during this period has been assessed as Critical.

Yearly Comparison

The following table shows a breakdown by location (nearest staffed aerodrome) of the security incidents reported as occurring during the year ending 31 December 2014, the previous year and the average for the three prior years.

Location (Aerodrome)	Year Ending Dec 2014	Year Ending Dec 2013	Average 3 Prior Yrs
Auckland	3	3	25.3
Christchurch	0	2	6.0
Wellington	1	3	6.3
Milford Sound	0	0	0.0
Gisborne	0	3	0.0
Nelson	2	1	1.3
Hamilton	0	1	1.3
Rotorua	0	0	0.0
Queenstown	0	0	1.3
Dunedin	0	0	0.7
Palmerston North	0	0	0.0
Other	2	2	2.7
Not Reported	8	5	17.0
Total	16	20	62.0

The following table shows a breakdown by Aircraft Statistics Category of the security incidents reported as occurring during the year ending 31 December 2014, the previous year and the average for the three prior years.

Aircraft Type	Year Ending Dec 2014	Year Ending Dec 2013	Average 3 Prior Yrs
Large Aeroplanes	3	9	8.7
Medium Aeroplanes	0	1	2.0
Small Aeroplanes	0	1	0.3
Helicopters	0	0	0.0
Sport Aircraft	0	0	0.0
Agricultural Aeroplanes	0	0	0.0
Parachutes	0	0	0.0
Hang Gliders	0	0	0.0
Other	13	9	51.0
Total	16	20	62.0

The large drop in the number of recorded security incidents is at least partly due to a correction in the way we interpret the definition of a security incident. No attempt has been made at this time to re-assess historic data.

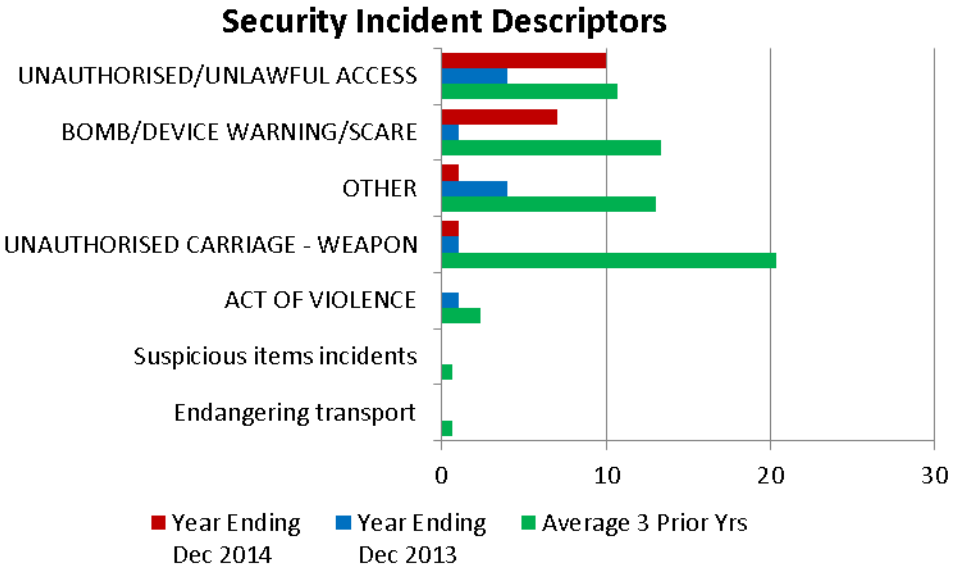
Descriptors and Causal Factors

The most common descriptor (10) recorded for Security Incidents during the Year Ending 31 December 2014 was 'UNAUTHORISED/UNLAWFUL ACCESS'

No causal factors have been recorded for security incidents that occurred during the Year Ending 31 December 2014.

Descriptors

The following chart shows the numbers of each occurrence descriptor that has been recorded for security incidents reported as occurring during the year ending 31 December 2014, the previous year and the average for the three prior years.



Aerodrome Incidents

Runway Incursions

Runway incursion rates are calculated by dividing the total number of reported Aerodrome Incidents that have any of the five runway incursion descriptors by the total number of reported movements for the same aerodrome over the same period. The result is tabulated and graphed as runway incursions per 100,000 movements.

Clearly the number of runway incursions is low with many certificated aerodromes having no such incidents reported at all. With such low numbers caution needs to be exercised in drawing statistical conclusions.

The following table shows 3 year moving average values of reported quarterly runway incursion rates for all certificated aerodromes for which adequate movement data is available.

Aerodrome	12/1	12/2	12/3	12/4	13/1	13/2	13/3	13/4	14/1	14/2	14/3	14/4
Gisborne	8.9	8.9	9.2	15.6	20.7	22.6	27.8	30.1	30.8	33.5	36.5	37.6
Tauranga	5.6	7.4	9.3	10.3	13.2	15.3	17.7	20.2	24.2	25.7	28.6	29.3
Hamilton	14.0	17.8	20.1	23.6	25.1	25.5	27.5	27.2	28.2	28.6	26.4	24.7
Whenuapai	9.5	14.0	20.7	22.8	20.2	18.1	24.6	24.4	26.4	26.6	26.6	24.3
Rotorua	11.9	14.6	14.5	16.1	24.9	23.8	23.6	22.3	24.0	24.1	18.5	17.0
Ohakea	2.7	2.9	3.8	4.0	5.1	7.8	8.2	13.9	14.0	14.9	20.7	23.9
Dunedin	8.5	9.1	12.6	12.2	16.1	18.4	18.6	19.4	19.5	21.3	19.2	18.4
Queenstown	12.2	11.5	14.0	14.9	15.6	15.7	15.6	14.8	11.6	12.3	11.5	12.8
Napier	11.5	12.6	12.6	12.5	12.7	14.2	15.5	13.0	11.9	12.2	10.9	8.3
Nelson	13.3	12.6	12.0	13.4	13.5	14.2	13.6	13.9	11.9	12.7	11.4	10.7
Woodbourne	4.3	5.7	4.3	4.3	5.8	5.8	8.8	8.8	8.9	9.0	7.6	9.2
Christchurch	7.5	7.6	7.8	7.9	8.3	7.5	8.2	7.7	7.7	7.2	7.5	7.0
New Plymouth	2.7	2.8	2.9	3.0	4.1	4.3	4.4	4.5	5.8	7.2	6.3	6.5
Invercargill	1.1	1.1	2.3	2.3	2.3	2.3	2.4	3.6	2.5	2.6	5.3	7.0
Palmerston North	3.9	3.3	3.2	3.7	4.7	4.2	4.7	4.8	5.3	5.4	5.5	6.8
Wellington	4.9	4.7	4.4	3.1	3.2	4.5	4.8	4.2	4.6	4.9	5.0	4.3
Taupo	2.4	2.4	2.4	2.5	2.5	2.6	2.6	2.6	1.3	1.4	2.8	4.2
Auckland	4.0	3.8	3.8	3.4	3.0	3.0	3.0	4.0	4.1	3.6	2.8	3.0
Overall	11.3	13.8	14.3	14.7	15.3	14.8	15.3	15.8	14.0	13.0	11.8	10.8

By way of comparison the FAA sets performance targets for **Category A and B** runway excursion incidents per **1,000,000** movements as follows

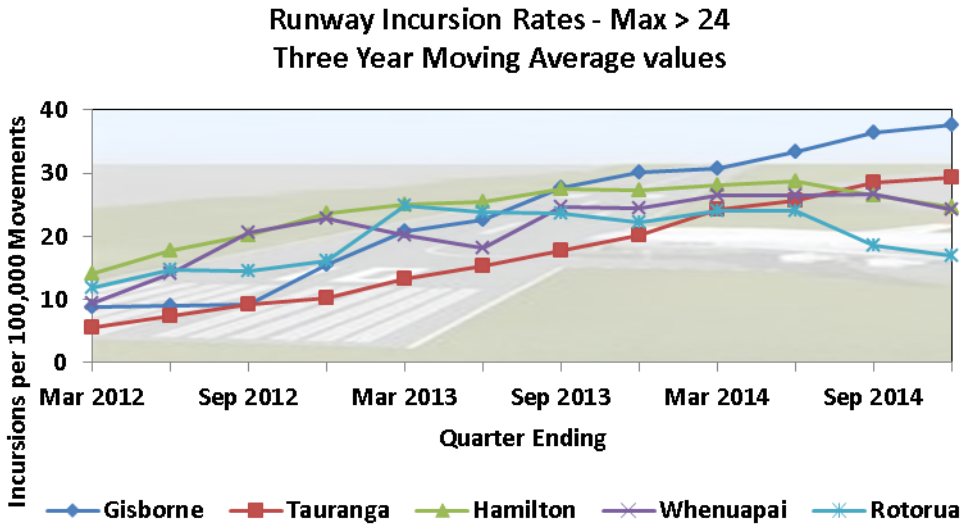
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Target	0.472	0.450	0.450	0.395	0.395
Actual	0.227	0.117	0.138	0.356	TBD

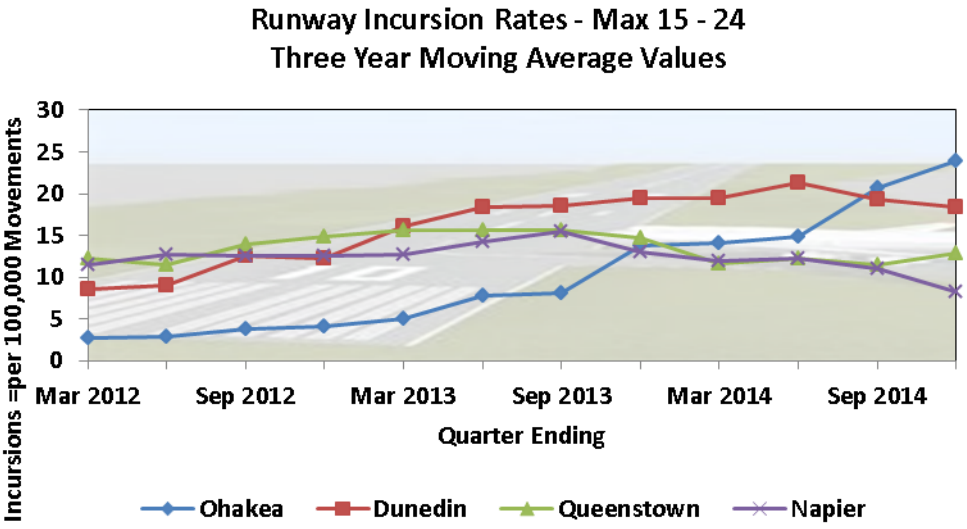
New Zealand category A and B figures for comparison would be:

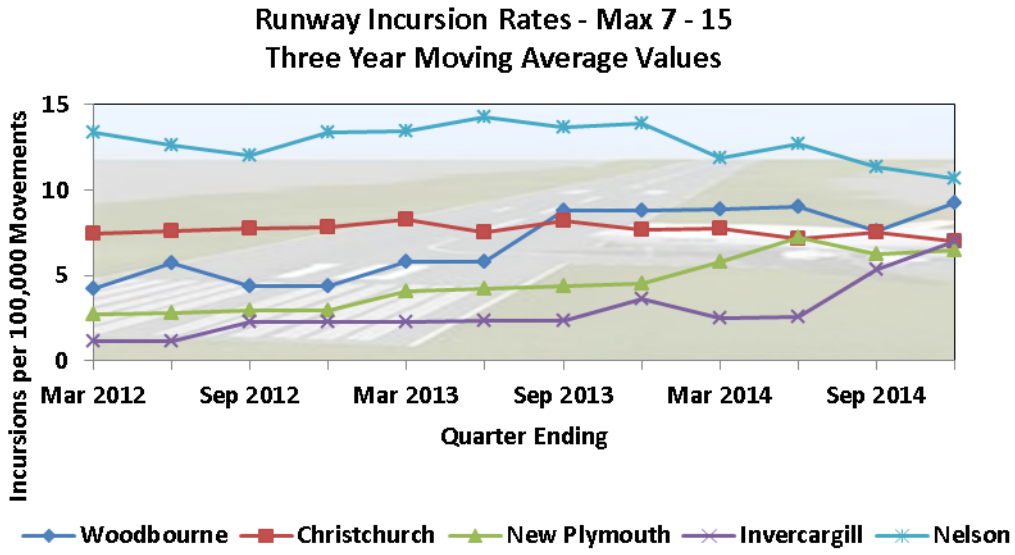
	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Actual	0.117	0.195	0.161	0.251	0.189

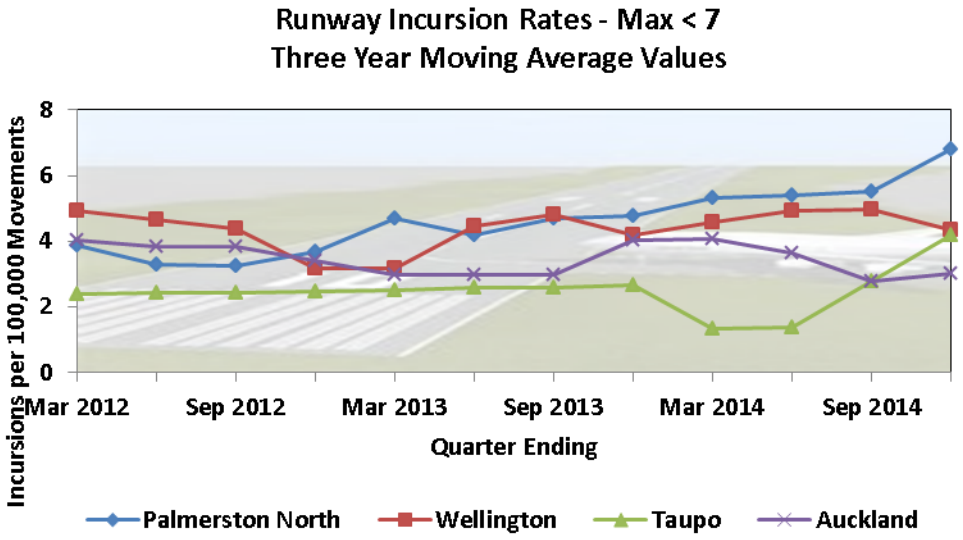
‘FY’ refers to the fiscal year used by the FAA. It runs from 1 October of the previous year to 31 September of the named year.

The charts on this page and the next show the above New Zealand data in a graphical way. Aerodromes have been grouped in an arbitrary way to keep the number of lines on each chart roughly equal. The grouping is based on the largest value reported over the period covered.






Runway Incursion Rates - Max 7 - 15
Three Year Moving Average Values
Incursions per 100,000 Movements
15
10
5
0
Mar 2012
Sep 2012
Mar 2013
Sep 2013
Mar 2014
Sep 2014
Quarter Ending
Woodbourne
Christchurch
New Plymouth
Invercargill
Nelson


Runway Incursion Rates - Max < 7
Three Year Moving Average Values
Incursions per 100,000 Movements
8
6
4
2
0
Mar 2012
Sep 2012
Mar 2013
Sep 2013
Mar 2014
Sep 2014
Quarter Ending
Palmerston North
Wellington
Taupo
Auckland

Occurrences — General

The following table shows the number of occurrences (excluding Non-Reportable Occurrences) that were registered on the CAA database during each of the 12 months of the reporting period.

Month	ACC	ADI	ARC	ASP	BRD	DEF	DGD	HGA	INC	NIO	PAA	PIO	SEC
Jan - 2014	13	14	80	131	111	176	16	2	61	1	0	3	1
Feb - 2014	14	10	74	95	85	106	13	3	57	2	0	1	0
Mar - 2014	14	15	95	135	103	117	9	1	56	3	3	0	0
Apr - 2014	5	12	71	75	99	127	5	2	62	4	1	0	2
May - 2014	2	15	77	125	148	136	4	0	60	2	0	3	2
Jun - 2014	4	8	53	114	93	113	2	0	55	2	3	2	4
Jul - 2014	1	12	77	141	98	187	4	0	74	0	2	3	2
Aug - 2014	2	9	63	129	84	152	1	0	59	0	0	1	1
Sep - 2014	5	21	78	132	104	133	7	3	81	5	0	3	2
Oct - 2014	6	24	66	137	97	95	3	4	78	2	0	1	0
Nov - 2014	6	17	74	99	102	128	4	3	69	1	1	1	1
Dec - 2014	6	15	71	111	97	98	9	1	48	1	0	2	1
Total	**78**	**172**	**879**	**1424**	**1221**	**1568**	**77**	**19**	**760**	**23**	**10**	**20**	**16**

ACC	Accident	**DGD**	Dangerous Goods Incident
ADI	Aerodrome Incident	**HGA**	Hang Glider Accident
ARC	Aviation Related Concern	**INC**	Aircraft Incident
ASP	Airspace Incident	**NIO**	Facility Malfunction Incident
BRD	Bird Incident	**PAA**	Parachute Accident
CSI	Cargo Security Incident	**PIO**	Promulgated Information Incident
DEF	Defect Incident	**SEC**	Security Incident

Causal Factor Summary

Introduction

The following section presents an summary of occurrence causes recorded during the year ending 31 December 2014 as determined by safety investigations.

The causal factor summary is grouped into three parts, each dealing with a unique sector of the aviation industry:

- Aircraft Flight Operations (Aircraft Operator Organisations and Flight Crew);
- Aircraft Maintenance Operations (Aircraft Maintenance/Design Organisations and Maintenance Engineers);
- Air Traffic Services and Personnel (Air Traffic Service Organisations and Air Traffic Service personnel).

The first two sections are further sub-grouped by Aircraft Category, namely:

- Large Aeroplanes;
- Medium Aeroplanes;
- Other Aeroplanes, Helicopters and Sport; and
- "Unknown".

A discussion of the Reason Model – Latent Failure Model used by the CAA for causal factor identification is provided in the appendix.

The following abbreviations apply:

ACC	Accident	**DGD**	Dangerous Goods Incident
ADI	Aerodrome Incident	**HGA**	Hang Glider Accident
ARC	Aviation Related Concern	**INC**	Aircraft Incident
ASP	Airspace Incident	**NIO**	Facility Malfunction Incident
BRD	Bird Incident	**PAA**	Parachute Accident
CSI	Cargo Security Incident	**PIO**	Promulgated Information Incident
DEF	Defect Incident	**SEC**	Security Incident

Aircraft Flight Operations

The following section summarises causal factors identified from investigation of occurrences that occurred during the year ended 31 December 2014 and which have been attributed to aircraft flight operations (the aircraft operator, organisation or flight crew). The number of times particular causal factors have been identified is reported by occurrence type.

Large Aeroplanes

Category	Cause	ACC	ADI	ASP	DEF	INC
Active Failure	ACTIONS INCONSISTENT WITH PROCEDURES			1		1
	INACCURATE SYSTEM "DIAGNOSIS"	1				3
	INAPPROPRIATE "STRATEGY"			1		1
	POOR PROCEDURE "ACTION"		1	1		1
	PRIMARILY "STRUCTURAL/MECHANICAL"			1	5	3
	STATE CHANGE NOT DETECTED "INFORMATION"					2
Organisation	DESIGN DEFICIENCIES					1
	INADEQUATE COMMUNICATIONS	1				
	INADEQUATE CONTROL AND MONITORING	2				
	INADEQUATE DEFENCES					1
	INADEQUATE PROCEDURES			1		1
	INADEQUATE RESOURCE MANAGEMENT			1		2
	INADEQUATE TRAINING				1	4
	OTHER ORGANISATION FACTOR					1
Task/Environment Error	HOSTILE ENVIRONMENT					2
	INADEQUATE CHECKING			1		
	LACK OF KNOWLEDGE	1				1
	POOR SYSTEM FEEDBACK					1
	PSYCHOLOGICAL OTHER			1		
	TASK UNFAMILIARITY			1		
Task/Environment Violation	OTHER VIOLATION ENFORCING CONDITION			1		2

Medium Aeroplanes

Category	Cause	ACC	ADI	ASP
Active Failure	INAPPROPRIATE "STRATEGY"	1		
Task/Environment Error	HOSTILE ENVIRONMENT	2		
	OTHER ERROR ENFORCING CONDITION			1
	POOR SIGNAL:NOISE		1	

Unknown Aircraft Category

Category	Cause	ARC	ASP	INC
Active Failure	ACTIONS INCONSISTENT WITH PROCEDURES			3
	INACCURATE SYSTEM "DIAGNOSIS"		1	2
	INAPPROPRIATE "GOAL"			1
	PRIMARILY "STRUCTURAL/MECHANICAL"		1	1
Organisation	POOR DECISIONS	1		
Task/Environment Error	INADEQUATE CHECKING		1	
	INTERPRETATION DIFFICULTIES			1
	PHYSIOLOGICAL OTHER			1
	TASK UNFAMILIARITY		1	

Other Aeroplanes, Helicopters and Sport Aircraft

Category	Cause	ACC	ADI	ARC	ASP	DEF	INC
Active Failure	ACTIONS INCONSISTENT WITH PROCEDURES				4		2
	INACCURATE SYSTEM "DIAGNOSIS"						2
	INAPPROPRIATE "GOAL"	1			1		
	INAPPROPRIATE "PROCEDURES"				2		
	INAPPROPRIATE "STRATEGY"				2	1	2
	POOR PROCEDURE "ACTION"	4			5		1
	PRIMARILY "STRUCTURAL/MECHANICAL"	7				13	
	STATE CHANGE NOT DETECTED "INFORMATION"	3					
Organisation	INADEQUATE CONTROL AND MONITORING	1					
	INADEQUATE PLANNING			1			
	INADEQUATE PROCEDURES						1
	INADEQUATE TRAINING						1
	INAPPROPRIATE GOALS OR POLICIES						1
Task/Environment Error	HOSTILE ENVIRONMENT	1					
	INADEQUATE CHECKING	3			7		2
	INEXPERIENCE (NOT LACK OF TRAINING)	1					1
	INFORMATION OVERLOAD				1		1
	INTERPRETATION DIFFICULTIES				1		
	LACK OF KNOWLEDGE	2	1				
	NEGATIVE TASK TRANSFER (HABITS)	1					
	POOR HUMAN-SYSTEM INTERFACE	1					
	PSYCHOLOGICAL OTHER				1		
	RISK MISPERCEPTION	2			2		2
	TASK OVERLOAD	1					1
	TASK UNFAMILIARITY						1
	TIME SHORTAGE		1		1		
Task/Environment Violation	HAZARD MISPERCEPTION	1					1
	OTHER VIOLATION ENFORCING CONDITION	3					

Aircraft Maintenance Operations

The following section summarises causal factors identified from investigation of occurrences that occurred during the year ended 31 December 2014 and have been attributed to aircraft maintenance operations (the aircraft operator, aircraft maintenance organisation or maintenance engineer). The number of times particular causal factors have been identified is reported by occurrence type.

Large Aeroplanes

Category	Cause	DEF	INC
Active Failure	PRIMARILY "STRUCTURAL/MECHANICAL"	1	2
	STATE CHANGE NOT DETECTED "INFORMATION"		1
Organisation	DESIGN DEFICIENCIES	1	
	INADEQUATE DEFENCES	1	
	INADEQUATE PROCEDURES	1	
Task/Environment Error	LACK OF KNOWLEDGE	1	
	POOR INSTRUCTIONS/PROCEDURES	1	
	TASK OVERLOAD	1	
Task/Environment Violation	POOR SUPERVISION & CHECKING	1	

Medium Aeroplanes

Category	Cause	DEF
Active Failure	POOR PROCEDURE "ACTION"	1
	PRIMARILY "STRUCTURAL/MECHANICAL"	1

Other Aeroplanes, Helicopters and Sport Aircraft

Category	Cause	ACC	DEF	INC
Active Failure	INAPPROPRIATE "PROCEDURES"		2	
	POOR PROCEDURE "ACTION"		2	
	PRIMARILY "STRUCTURAL/MECHANICAL"		6	
Organisation	DESIGN DEFICIENCIES	1	4	
	INADEQUATE COMMUNICATIONS		1	
	INADEQUATE PROCEDURES		2	1
	UNSUITABLE EQUIPMENT		1	
Task/Environment Error	INADEQUATE CHECKING	1	1	1
	INTERPRETATION DIFFICULTIES		1	
	LACK OF KNOWLEDGE		1	

Unknown Aircraft Category

Category	Cause	ARC	DEF	INC
Organisation	INADEQUATE PROCEDURES		6	
Task/Environment Error	LACK OF KNOWLEDGE			1
	POOR INSTRUCTIONS/PROCEDURES	2		

Air Traffic Services and Personnel

The following tables summarise causal factors identified from investigation of occurrences that occurred during the year ended 31 December 2014 and which have been attributed to air traffic services or personnel. The number of times particular causal factors have been identified is reported by occurrence type.

Air Traffic Service Providers

Category	Cause	ADI	ASP	INC	PIO
Organisation	DESIGN DEFICIENCIES		4		
	INADEQUATE CONTROL AND MONITORING		1		
	INADEQUATE DEFENCES	1	1		
	INADEQUATE PROCEDURES	1	1		
	INADEQUATE TRAINING		5		
	INAPPROPRIATE GOALS OR POLICIES		1		
	OTHER ORGANISATION FACTOR		4		
Task/Environment Error	INADEQUATE CHECKING		2		
	OTHER ERROR ENFORCING CONDITION		2		
	PHYSIOLOGICAL OTHER		4		
	PSYCHOLOGICAL OTHER		2	1	1
	RISK MISPERCEPTION		3		
	TIME SHORTAGE		1		

Air Traffic Service Personnel

Category	Cause	ADI	ASP
Active Failure	INAPPROPRIATE "PROCEDURES"		2
	POOR PROCEDURE "ACTION"		1
Task/Environment Error	INADEQUATE CHECKING	1	
	OTHER ERROR ENFORCING CONDITION		1
	POOR SIGNAL:NOISE	1	

Client Risk Assessment

Introduction

The CAA's client risk assessment system came into operation in February 2007.

The system measures a series of factors, rated using a scale of 1 to 5 where 1 is an exemplary rating. It is a qualitative rating and relates solely to the interaction the CAA staff member is having with the client at that time, or to changes in the organisation recorded in the CAA database.

Risk profiles can be generated at any time, including at the end of every audit.

The combined ratings form a risk assessment used to help decide the depth and frequency of inspection and monitoring for each client.

Results are in the form of a percentage of the maximum possible score (if all factors had been rated 5), and are divided into bands of low, moderate, high and very high:

Low: <=16%

Moderate: 16-26%

High: 26-36%

Very High: >36%

Clients can have several risk profiles current at one time, one for each activity. Each risk profile is independent of the others, and applies only to the relevant activity.

The following table refers to risk profiles current on the dates shown and shows the numbers of certificate holders with risk scores in each band.

Comparison of Client Numbers in Risk Score Bands

(as at 31 December 2014 and over the Preceding Four Years)

	As at 31 December 2014				Average at end of each of the 4 previous 12 month periods			
Activity	**Very High**	**High**	**Mode rate**	**Low**	**Very High**	**High**	**Mode rate**	**Low**
Australia AOC with ANZA Privileges Part 108 Security Programme	0	0	0	1	0.0	0.0	0.0	0.5
Part 108 Security Programme	0	0	0	3	0.0	0.0	0.0	1.5
Part 109 Regulated Air Cargo Agent	0	1	11	54	0.5	1.0	8.3	52.3
Part 115 Adventure Aviation Operator Certificate	2	0	3	23	0.5	1.3	6.5	7.8
Part 121 Air Operator Large Aeroplanes	0	0	0	2	0.0	0.0	0.0	3.5
Part 125 Air Operator Medium Aeroplanes	1	0	0	5	0.8	0.3	0.0	5.8
Part 129 Foreign Air Transport Operator	0	0	1	23	0.5	0.0	1.3	24.3
Part 135 Air Operator Helicopters and Small Aeroplanes	1	2	24	79	1.3	2.8	31.0	85.3
Part 137 Agricultural Aircraft Operator	0	5	17	50	0.5	2.0	17.5	54.3
Part 139 Aerodrome Operator	0	0	1	17	0.0	0.0	0.3	21.8
Part 140 Aviation Security Service Organisation	0	0	0	1	0.0	0.0	0.0	0.5
Part 141 Aviation Training Organisation	0	1	4	19	0.3	0.3	2.0	26.8
Part 145 Maintenance Organisation	1	0	0	18	0.8	0.3	1.0	26.3
Part 146 Aircraft Design Organisation	0	0	0	8	0.0	0.0	1.0	8.0
Part 148 Aircraft Manufacturing Organisation	1	0	0	7	0.0	0.3	0.8	9.3
Part 149 Aviation Recreation Organisation	0	1	0	6	0.3	0.0	1.0	4.8
Part 171 Telecom Service Organisation	0	0	0	0	0.0	0.0	0.0	1.0
Part 172 Air Traffic Service Organisation	0	0	0	1	0.0	0.3	0.0	0.0
Part 173 Instrument Flight Procedure	0	0	0	1	0.0	0.0	0.0	2.0
Part 174 Meteorological Service Organisation	0	0	0	0	0.0	0.0	0.0	1.0
Part 175 Aeronautical Info Service Organisation	1	0	0	0	0.0	0.0	0.0	0.8
Part 19F Supply Organisation	0	0	5	30	0.5	0.3	3.5	36.0
Part 61 Pilot Licence (Aeroplane) Holder	0	0	0	0	0.3	0.0	0.0	0.5
Part 92 Dangerous Goods Packaging Approval Holder	0	0	0	2	0.0	0.0	0.0	1.8

Appendix — Definitions

General

Accident [ACC] — means an occurrence that is associated with the operation of an aircraft and takes place between the time any person boards the aircraft with the intention of flight and such time as all such persons have disembarked and the engine or any propellers or rotors come to rest, being an occurrence in which–

(1) a person is fatally or seriously injured as a result of–

(i) being in the aircraft; or

(ii) direct contact with any part of the aircraft, including any part that has become detached from the aircraft; or

(iii) direct exposure to jet blast–

except when the injuries are self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to passengers and crew; or

(2) the aircraft sustains damage or structural failure that–

(i) adversely affects the structural strength, performance or flight characteristics of the aircraft; and

(ii) would normally require major repair or replacement of the affected component–

except engine failure or damage that is limited to the engine, its cowlings, or accessories, or damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents, or puncture holes in the aircraft skin; or

(3) the aircraft is missing or is completely inaccessible.

Aerodrome incident [ADI] — means an incident involving an aircraft operation and–

(1) an obstruction either on the aerodrome operational area or protruding into the aerodrome obstacle limitation surfaces; or

(2) a defective visual aid; or

(3) a defective surface of a manoeuvring area; or

(4) any other defective aerodrome facility.

Aircraft incident [INC] — means any incident, not otherwise classified, associated with the operation of an aircraft.

Airspace incident [ASP] — means an incident involving deviation from, or shortcomings of, the procedures or rules for–

(1) avoiding a collision between aircraft; or

(2) avoiding a collision between aircraft and other obstacles when an aircraft is being provided with an Air Traffic Service.

Bird incident [BRD] — means an incident where–

(1) there is a collision between an aircraft and one or more birds; or

(2) when one or more birds pass sufficiently close to an aircraft in flight to cause alarm to the pilot.

Cargo security incident [CSI] — means an incident involving cargo or mail that is carried, or has been accepted by a regulated air cargo agent or an air operator for carriage, by air on an aircraft conducting an international regular air transport operation passenger service, and–

(1) there is evidence of tampering or suspected tampering with the cargo or mail which could be an act or an attempted act of unlawful interference; or

(2) a weapon, explosive, or other dangerous device, article or substance, that may be used to commit an act of unlawful interference is detected in the cargo or mail.

Dangerous goods incident [DGD] — means an incident associated with and related to the carriage of dangerous goods by air after acceptance by the operator, that–

(1) results in injury to a person, property damage, fire, breakage, spillage, leakage of fluid or radiation, or other evidence that the integrity of the packaging has not been maintained; or

(2) involves dangerous goods incorrectly declared, packaged, labelled, marked, or documented.

Defect incident [DEF] — means an incident that involves failure or malfunction of an aircraft or aircraft component, whether found in flight or on the ground.

Facility malfunction incident [NIO] — means an incident that involves an aeronautical facility.

Fatal Injury — means any injury which results in death within 30 days of the accident.

Incident — means any occurrence, other than an accident, that is associated with the operation of an aircraft and affects or could affect the safety of operation. Note: Incident has many sub-categories.

Occurrence — means an accident or incident.

Promulgated information incident [PIO] — means an incident that involves significantly incorrect, inadequate, or misleading information or aeronautical data promulgated in an aeronautical information publication, map, chart, or otherwise provided for the operation of an aircraft.

Security incident [SEC] — means an incident that involves unlawful interference.

Serious Injury — means any injury that is sustained by a person in an accident and that–

(1) requires hospitalisation for more than 48 hours, commencing within 7 days from the date the injury was received; or

(2) results in a fracture of any bone, except simple fractures of fingers, toes, or nose; or

(3) involves lacerations which cause severe haemorrhage, nerve, muscle, or tendon damage; or

(4) involves injury to an internal organ; or

(5) involves second or third degree burns, or any burns affecting more than 5% of the body surface; or

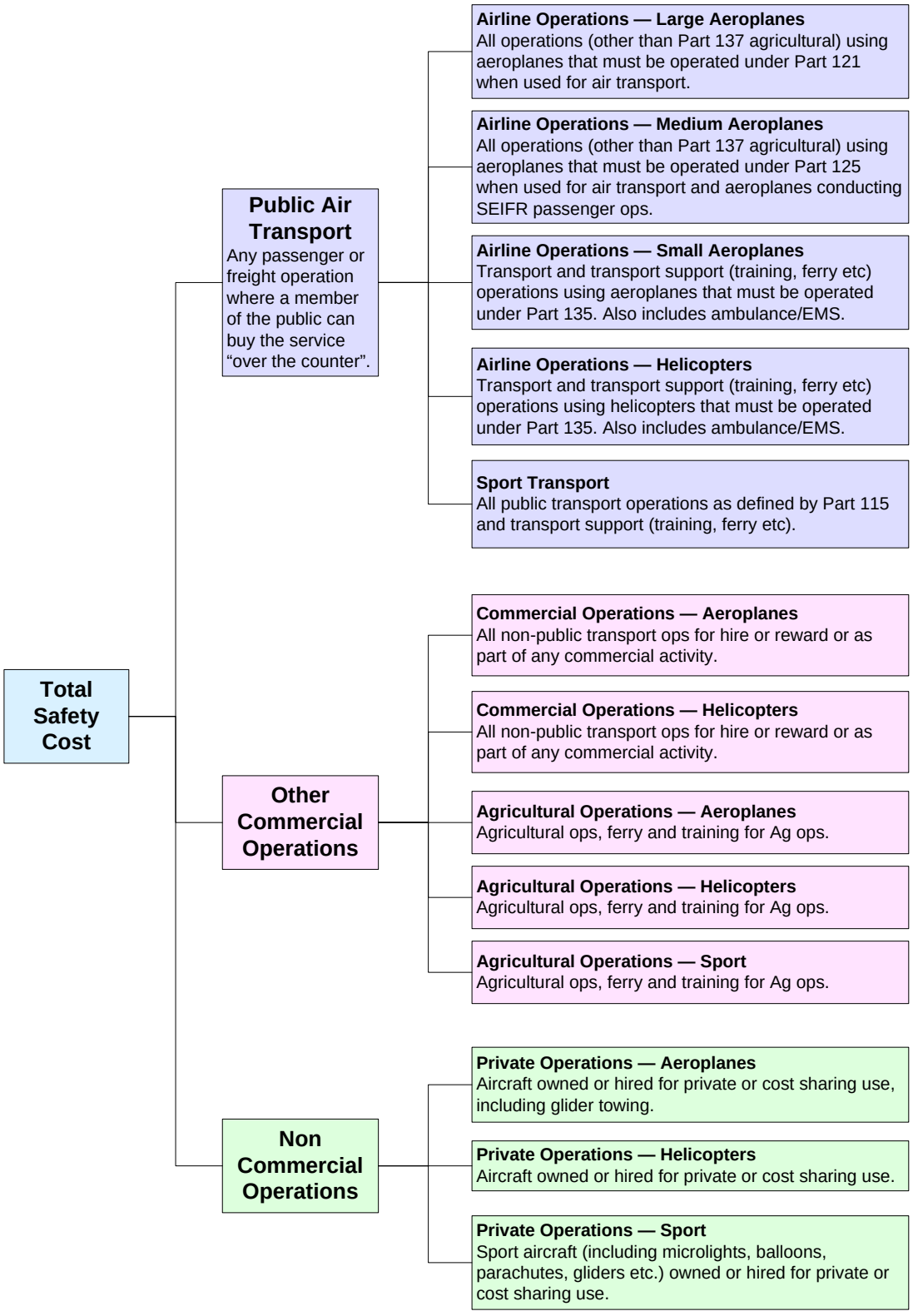
(6) involves verified exposure to infectious substances or injurious radiation.

Severity

The following definitions apply to the severity accorded to occurrences and to findings as the result of investigation of occurrences.

Severity Factor		Definition
CR	Critical	An occurrence or deficiency that caused, or on its own had the potential to cause, loss of life or limb;
MA	Major	An occurrence or deficiency involving a major system that caused, or had the potential to cause, significant problems to the function or effectiveness of that system;
MI	Minor	An isolated occurrence or deficiency not indicative of a significant system problem.

Safety Target Groups



Target group name	General description	Includes	Excludes
Airline Operation - Large Aeroplanes	All operations using large passenger and freight aeroplanes that are operated under part 121	Ferry, test, training, passenger and freight, domestic and international, Part 91 operations, and commercial operations other than Part 137 agricultural operations. Includes all aeroplanes that have a passenger seating configuration of 30 seats or more, or a payload capacity of more than 3410kg.	Part 137 agricultural operations
Airline Operation - Medium aeroplanes	All operations using medium passenger and freight aeroplanes that are operated under part 125.	Ferry, test, training, passenger and freight, domestic and international, Part 91 operations, and commercial operations other than Part 137 agricultural operations. Aeroplanes that have a seating configuration of 10 to 30 seats, excluding any required crew member seats, or a payload capacity of 3410 kg or less and a MCTOW of greater than 5700 kg, and any aeroplanes conducting SEIFR passenger operations.	Part 137 agricultural operations
Airline Operation - Small aeroplanes	All operations by 119 certificate holders using other aeroplanes.	Ferry, test, passenger and freight, domestic and international, training in support of Part 135 operations, Ambulance/EMS	Part 137 agricultural operations, Part 91 operations, and commercial operations. SEIFR under Part 125
Airline Operation - Helicopters	All operations by 119 certificate holders using helicopters	Ferry, test, passenger and freight, domestic and international, training in support of Part 135 operations, Ambulance/EMS	Part 137 agricultural operations, Part 91 operations, and commercial operations. SEIFR under Part 125
Commercial Operations - Aeroplane	Other commercial operations Aeroplane (all non-public transport ops for hire or reward or as part of any commercial activity)	Positioning, ferrying flights, training (dual and solo), "Commercial non-certified", Business and Executive	Public transport ops, Agricultural ops & training for Agricultural ops, non-commercial ops
Commercial Operations - Helicopter	Other commercial operations Helicopter (all non-public transport ops for hire or reward or as part of any commercial activity)	Positioning, ferrying flights, training (dual and solo), "Commercial non-certified", Business and Executive	Agricultural ops & training for Agricultural ops, public transport, non-commercial ops.
Agricultural Operations - Aeroplane	Agricultural operations using aeroplanes	Agricultural ops, ferry & training for Ag ops.	Everything else.
Agricultural Operations - Helicopters	Agricultural operations using helicopters	Agricultural ops, ferry & training for Ag ops.	Everything else
Agricultural Operations - Sport Aircraft	Agricultural operations using sport aircraft	Agricultural ops, ferry & training for Ag ops.	Everything else
Private Aeroplane	Private operations in aeroplanes	Cost sharing, aircraft hired from schools and clubs for private or cost sharing use, glider towing	Airline, commercial, agricultural operations, sport aircraft, balloons, training (dual and solo)
Private Helicopter	Private operations in helicopters	Cost sharing, aircraft hired from schools and clubs for private or cost sharing use	Airline, commercial, agricultural operations, sport aircraft, balloons, training, ferry/positioning flights by commercial operators
Sport Transport	All public transport ops by sport aircraft	Ferry, test, passenger and freight, domestic and international, training for such ops. And balloons	Agricultural operations.

Target group name	General description	Includes	Excludes
Sport Private	Private operations using sport aircraft	Cost sharing, aircraft hired from schools and clubs for private or cost sharing use, training, gliders, power gliders, hang gliders, parachutes and all forms of inflatable wing, balloons	Airline, commercial, agricultural operations, and training for these activities

Aircraft Categories

Aircraft Statistics Category	Definition	Aircraft Class
Large Aeroplanes	Aeroplanes that must be operated under Part 121 when used for air transport	Aeroplane
Medium Aeroplanes	Aeroplanes that must be operated under Part 125 when used for air transport, except for those required to operate under Part 125 solely due to operating SEIFR	Aeroplane
Small Aeroplanes	Other Aeroplanes with Standard Category Certificates of Airworthiness	Aeroplane
Agricultural Aeroplanes	Aeroplanes with Restricted Category Certificates of Airworthiness limited to agricultural operations	Aeroplane
Helicopters	Helicopters with Standard or Restricted Category Certificates of Airworthiness	Helicopter
Sport Aircraft	All aircraft not included in the groups above	Aeroplane, Amateur Built Aeroplane, Amateur Built Glider, Amateur Built Helicopter, Balloon, Glider, Gyroplane, Helicopter, Microlight Class 1, Microlight Class 2, Power Glider

Significant Events

The following text is taken from the procedure SI - 0.0 Occurrence Management, 0.08 - Occurrence completion:

To facilitate in deciding whether or not your investigation file should be "tagged" as a "Significant Event" here are some occurrences that substantially meet the criteria.

- Occurrences that are investigated by TAIC unless it is known that the TAIC are using the event for their own training purposes and would not otherwise be investigating.
- Critical air transport occurrences resulting in Near Collision (provided one of the aircraft involved is airborne, nearly airborne, or has just landed). In cases where an aircraft is landing or taking off the event would not be significant unless the aircraft's speed was in excess of 10 kts.
- Critical air transport occurrences resulting in Loss of Control
- Critical air transport occurrences where a Distress or Urgency call was (or should have been) made
- Air transport occurrences where the last in a series of "redundant" systems failed in flight or during take off or landing
- SEIFR air transport occurrences involving loss of engine power to the extent that an unscheduled landing is required
- Fatal accidents
- Occurrences that are relevant to a current (group) of safety concerns. For example in 1999/2000 aircraft electrical wiring was a significant international concern therefore occurrences in the New Zealand fleet of electrical wiring problems may warrant them being tagged as significant.
- Occurrences that are relevant to the current CAA (Business) Safety Plan. For the 1999/2000-year collision with terrain, obstacles, and water; controlled flight into terrain and loss of control in flight were relevant for aircraft with a MCTOW of 5,670 kg and above.
- Engine failure in 2-plus engined air transport aircraft at critical phases of flight or failures of a nature that may have a fleet impact or significantly affect safe operations or are subject to media scrutiny.
- Significant structural or engine failure of a private GA aircraft/helicopter that may have implications for the fleet type, particularly where that type is used for air transport operations.

Serious Events

The following text is taken from the procedure SI - 2.0 Safety Investigation - Appendices, 2.02 Appendix B - Aviation Occurrence Notification Checklist:

“Serious incident” means an incident involving circumstances indicating that an accident nearly occurred. The difference between an accident and serious incident lies only in the result (ICAO Annex 13 definition). The serious incidents listed below are extracted from ICAO Annex 13 attachment D. The list is not exhaustive and only serves as guidance to the definition of serious incident.

(a) Near collisions requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate.

(b) Controlled flight into terrain only marginally avoided.

(c) Aborted take-off on a closed or engaged runway.

(d) Take-off from a closed or engaged runway with marginal separation from obstacle(s).

(e) Landings or attempted landings on a closed or engaged runway.

(f) Gross failures to achieve predicated performance during take-off or initial climb.

(g) Fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents.

(h) Events requiring the emergency use of oxygen by the flight crew.

(i) Aircraft structural failures or engine disintegration’s not classified as an accident.

(j) Multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft.

(k) Flight crew incapacitation in flight.

(l) Fuel quantity requiring the declaration of an emergency by the pilot.

(m) Take-off or landing incidents. Incidents such as undershooting, overrunning or running off the side of runways.

(n) System failures, weather phenomena, operations outside the approved flight envelope or other occurrences, which could have caused difficulties controlling the aircraft.

(o) Failures of more than one system in a redundancy system mandatory for flight guidance and navigation.

Reason Model – Latent Failure Model

CAA identification of occurrence causal factors is based on the Reason Model (latent failure model). Occurrence investigations attempt to assign attributable cause by identifying the generic type of organisation or person involved and the contributing active failures, local factors, and/or organisation factors. The analysis contained in the Causal Factor Analysis section of this report summarises the results from investigation by reporting the different types of causal factors identified versus occurrence type. It should be noted that occurrence types (e.g. Accident, Defect etc.) are not mutually exclusive (e.g. an accident and a defect may be associated) and hence any causal factor recorded during the investigation will be recorded for all associated occurrence types.

The following two diagrams are designed to show the basic principles of the latent failure model:

Diagram 1

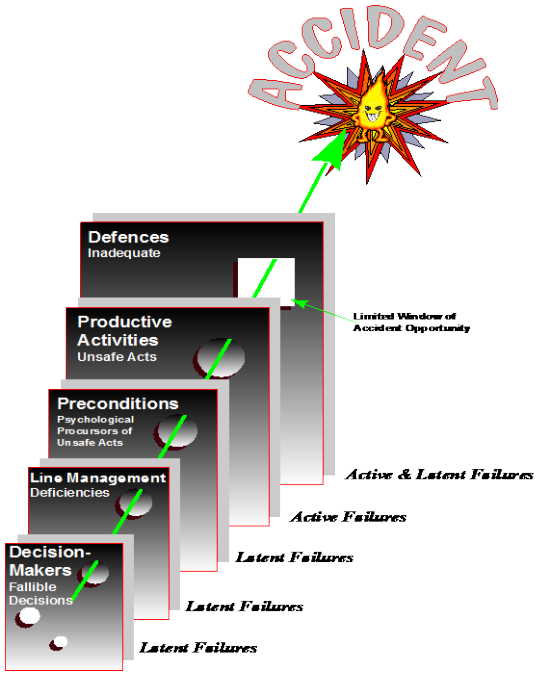


Diagram 1 shows the layers of defences that have been created within the aviation system to prevent accidents and incidents happening. It also shows how these defences have holes in them. When these holes line up there is a window of opportunity for an accident or incident. All that is needed to complete the breach in the defence is an active failure at the operational level. When this happens an accident occurs. When the defences in the system work properly and are only partially breached the end result may be an incident. Incidents are free lessons that should be investigated to show where the holes (latent failures) in the system are. Holes in the system are there all the time and a good pro-active audit program should also help in detecting them.

Diagram 2

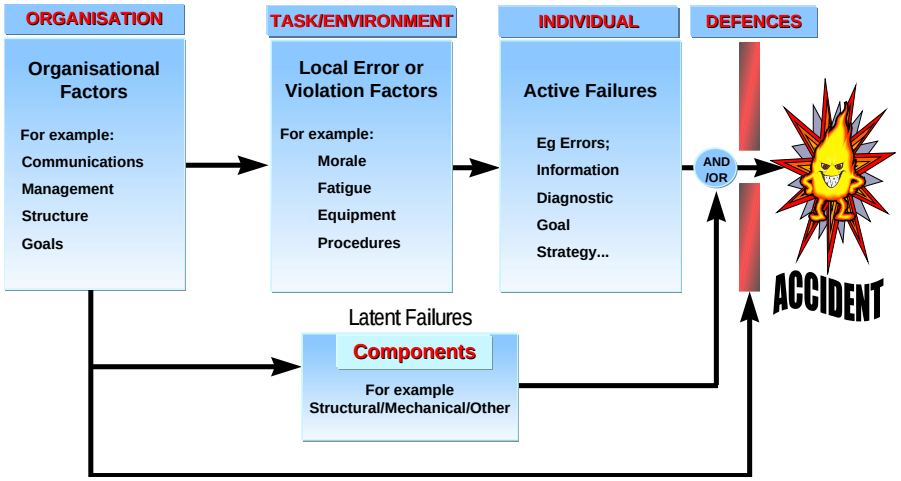


Diagram 2 shows how the latent failures are grouped into 3 areas:

1. The active failures.
2. Task/environment or local factors.
3. Organisational factors.

In basic terms the latent failure model states that an accident is predicated by deficiencies in the management and physical systems responsible for and supporting the particular operation. Management system deficiencies in the responsible organisation(s) can lead to error or violation inducing conditions in the local working environment. The existence of these conditions increases the likelihood of actual errors or violations by personnel which can place an over-reliance on, or expose deficiencies in, final defences.