Aviation Safety Report

Intelligence, Safety and Risk Analysis Unit

1 July 2014 to 30 June 2015

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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 July 2014 to 30 June 2015.[1] Note this is the fifth Aviation Safety Report that covers a 12 month period. Feedback suggests that a 'last 12 months' or 'per year' basis enables better comparisons between periods than the 6 monthly basis of the earlier twice yearly summary reports.

Key Indicators

- Measures of industry activity such as numbers of aircraft, air transport flights, seat hours and total hours flown have continued to increase.
    - Aircraft on the Register increased slightly by 1.5%
    - Airline Air transport flights increased by 5.8%
    - Adventure Aviation flights including parachute descents increased by 16.2%
    - Seat hours increased by 2.1% and,
    - Total hours flown increased by 4.9%
- The number of organisational certificates issued has decreased by 0.6 % to 970.
- The number of aircraft movements at principal aerodromes has decreased by 4.4% 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 100, down from 109 in the last period, and the trend is slightly down relative to the average of the preceding three years (102 accidents pa).
- There were 13 fatalities, 3 more than in the previous 12 months but the same as the average of the last three years (13 fatalities pa).
- The accident, fatalities and social cost statistics are now led by private aeroplane, private sport aircraft and other commercial helicopters, but several accidents, fatal and non-fatal, have seen airline helicopters (part 135), approaching the level of social cost per seat hour associated with agricultural aeroplanes and helicopters.
- The recent surge in the airspace incident rate continues. This period the number of airspace occurrences (all types) has increased by 13.6% on the last 12 months while the total flying hours in the same period increased by 4.9%.

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

Industry status as at 30 June 2015 and trend over the preceding 9 years

This section is organised into three parts

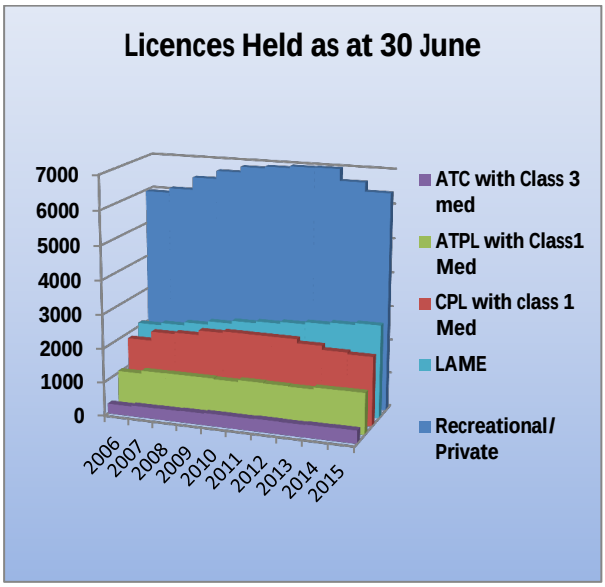
- Industry Size
- Industry Activity
- Safety Outcomes

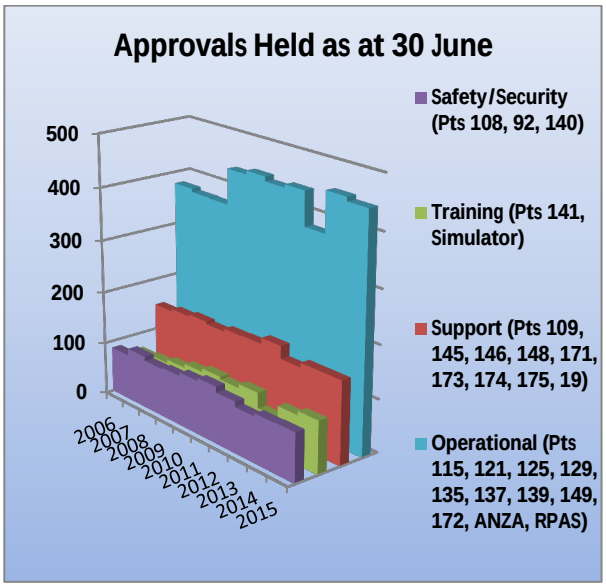
Industry Size

Several different measures of industry size are available. No single measure is likely to meet the needs of all readers. Available measures are

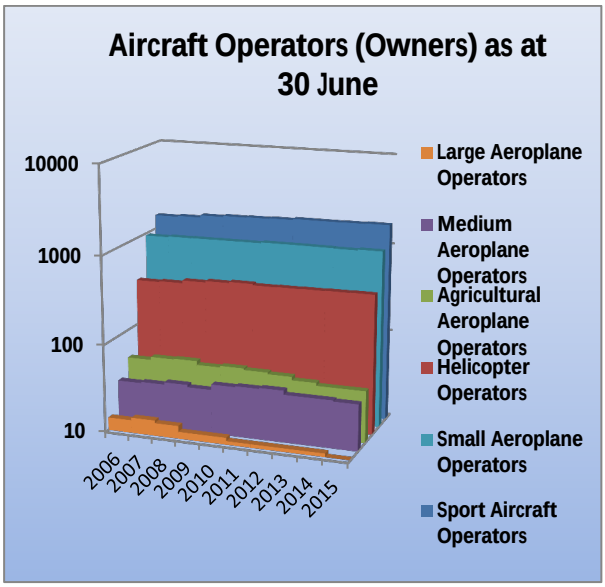
- Number of licenses (with current medical certificates as appropriate) at the year end
- Number of certificates and other operational approvals at the year end
- Number of aircraft operators (owners) at the year end
- Number of aircraft recorded as active at the year end

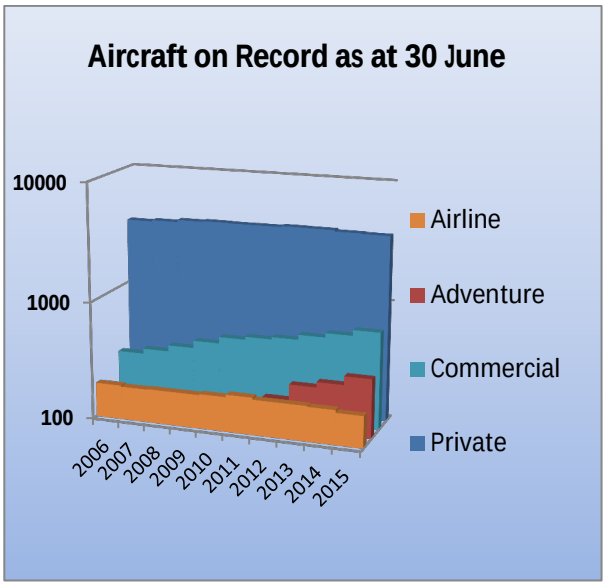
Ten year movements of these measures are summarised in the following graphs:





Don't be fooled by the logarithmic scale on the next 2 charts





Notes and Comment

Licenses

The 'Recreational/Private' group consists of holders of RPL licences who have appropriate current medical certificates plus holders of any pilot licence who have current class 2 medical certificates plus holders of PPL licenses only who hold a current class 1 medical certificate.

There is no medical requirement for holders of LAME licences which are issued on a lifetime basis. The increase in their numbers is simply an indication that more licences are being issued than holders' lifetimes are terminating.

Both the Recreational/Private and the CPL groups have been slowly declining in numbers over the last 3 years Microlight certificates issued by Part 149 organisations are not included and it has been suggested that PPL and RPL holders might be choosing to operate in the Microlight sector rather than the fully licensed sector.

Approvals

No significant trends are evident.

The number of Part 145 Aircraft Maintenance Organisation approvals peaked 4 years ago at 67 and has since declined to 56. If this is evidence of a continuing trend there might be a case for further assessment.

The number of Part 121 Large Aeroplane Operator approvals has fallen from 11 at the end of June 2006 to 7 at the end of June 2015. This sector is closely monitored.

The numbers of Part 137 Agricultural Aircraft Operator approvals declined from 117 at the end of June 2006 to 99 at the end of June 2014. This decline is not steady and varies from year to year. This sector is closely monitored and the decline does not represent any safety concern.

Aircraft Operators (Owners)

Those operators who operate more than one category of aircraft have been counted in each category. This means that any attempt to total the numbers will lead to more operators than actually exist.

The number of Large Aeroplane operators is declining and the number of Agricultural Aeroplane operators peaked in 2007 and has been declining ever since. The number of Medium Aeroplane operators peaked in 2012 and 2013 and is now back to the same level as in 2006. All other categories show small increases in the number of operators.

Aircraft

Aircraft have been counted in the Adventure group if there was a current Part 115 approval for the aircraft at the 30 June year end. Aircraft have been counted in the Private group if they have no Part 119 or Part 115 approval and they are not an agricultural aeroplane

The vast majority of aircraft recorded in the CAA database are private and their numbers climbed until 2012 and have declined since then. The most notable trend is in the commercial group where the numbers have increased by 244% since June 2006. Both fixed wing and rotary have contributed to this increase but the rotary component is the major factor having gone from 133 at the end of June 2006 to 442 at the end of June 2015.

For more detail follow these links:

Licences Aircraft Owners Approvals

Industry Activity

Most activity measures depend on operations statistics returns supplied by operators under the requirements of rule part 12.151 or rule part 19.103 for agricultural aviation statistics.

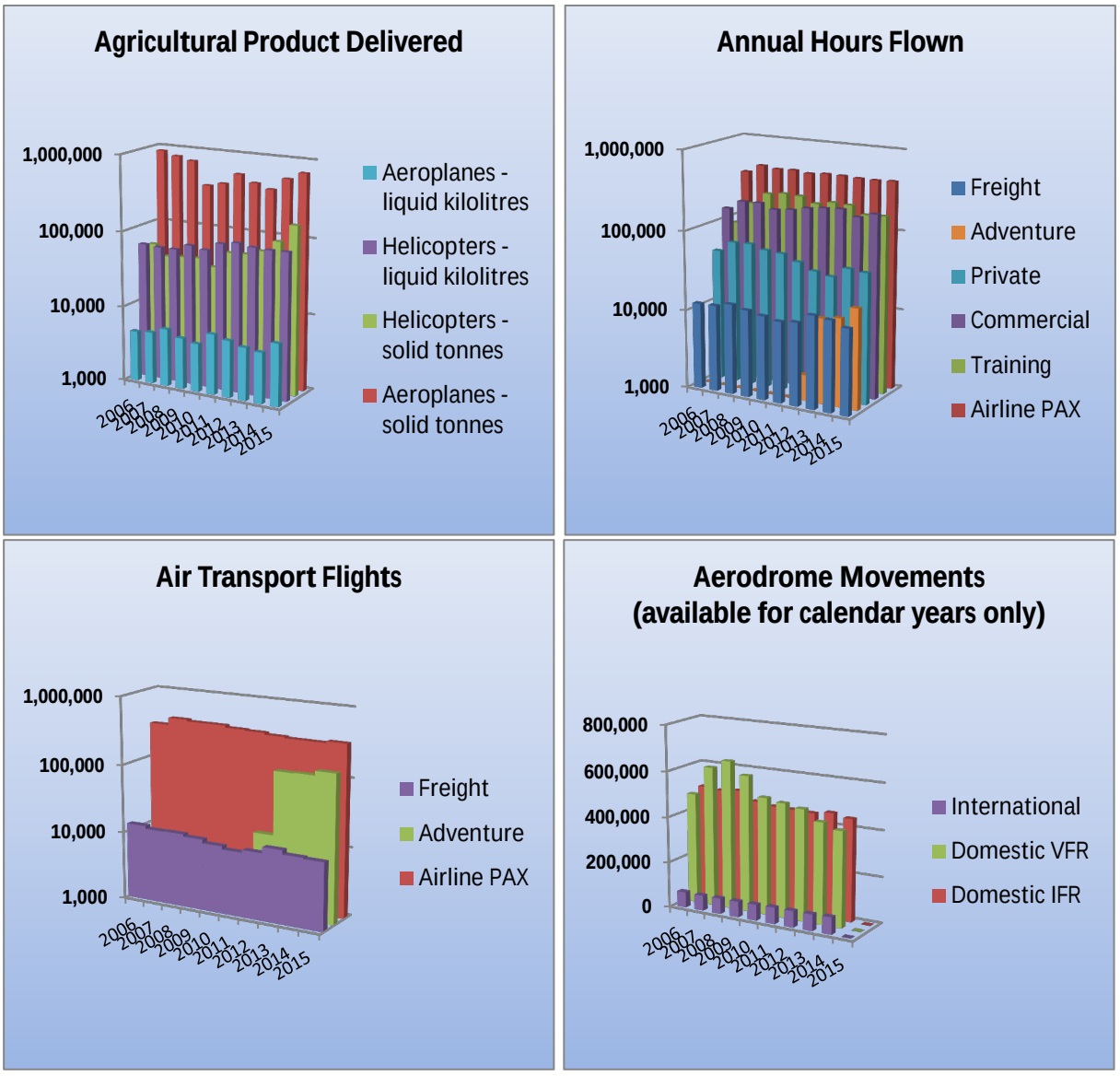
Compliance with these rules is inconsistent and varies widely across the industry. Activity estimates are carried out to adjust the industry totals for non-compliant operators. These estimates are calculated by assuming each non-compliant operator carries out the same mix of operations as the average of all compliant operators of the same aircraft category and class for the year and quarter being measured. At the time of data extraction 44% of expected returns for the year ended 30 June 2015 had not been received.

The following measures of industry activity are available

- Estimate of Hours Flown during the year
- Estimate of Air Transport flights conducted during the year
- Estimate of Agricultural Product delivered during the year
- Aerodrome Movements conducted during the year at monitored aerodromes

These measures are summarised in the following graphs that relate to years ending 30 June:

Note the logarithmic scale on the first 3 charts



Notes and Comment

Agricultural Product Delivered

There are no obvious trends in this measure but the values display wider variations from year to year than in some other sectors.

Hours Flown

The data presented here includes a 'standard' allowance for those aircraft for which no data had been received at the time of data extraction. This means that more recent data is less reliable than earlier data because there are more missing returns for more recent return periods.

Air Transport Flights

The comment in the previous section about the reliability of recent data applies equally to the air transport flights data.

The Adventure Aviation flights include all parachute descents carried out by Part 115 certificated organisations. Parachute descents make up approximately 55% of all Adventure Aviation flights.

No significant trends are apparent

Aerodrome Movements

This data is obtained directly from the Airways Corporation website and is only available with this level of detail on calendar year basis. The data is therefore presented as at the end of December 2014. It covers only aerodromes that have an Airways presence either as ATC or Flight Service. An examination of airlines' published schedules suggests that there are between 10 and 20 thousand scheduled movements at certificated aerodromes that are not included in our data. With the exception of Taupo Airport, there is no data available on the numbers of unscheduled movements at certificated aerodromes that have no Airways presence. Taupo aerodrome's annual movements averaged 29982 over the 10 year period covered by this report and were 22642 during the 2014 calendar year.

There has been a steady decline in VFR movements at Airways monitored aerodromes since a peak of 646695 in 2008. This may be no more than a reflection of the move of private flying away from busy commercial airports or may support a claim that private flying is declining in New Zealand generally.

For more detail follow these links:

Hours Flown Flights Aerodrome Movements

Safety Outcomes

Safety outcome measures covered in this report include

1. Fatality and serious injury rates
2. Accident rates
3. Airspace, Operational, Aerodrome, Defect, Bird and Security incident rates
4. Social costs
5. Participant Risk-Assessments

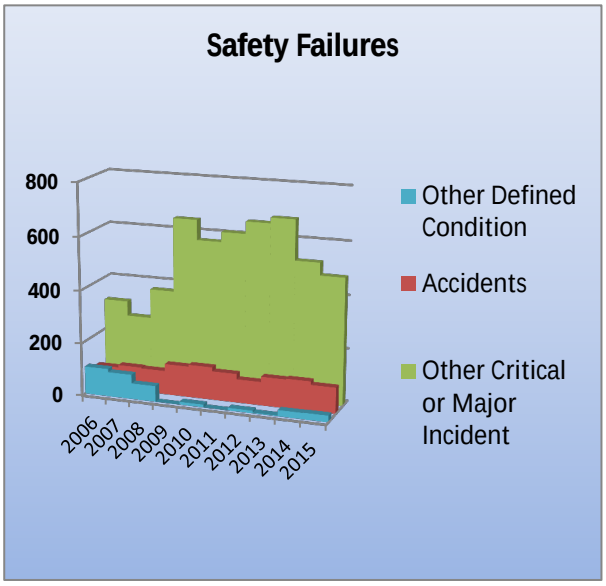
It is not practicable to summarise all of these measures in a concise form so this summary focusses on a concept of Safety Outcomes which classifies all reported occurrences into three groups, Safety Failures, Close Calls and Safety Successes. Aviation-Related Concerns, Risk Assessments and Non-Compliance Findings are summarised separately.

The values relate to years ending 30 June.

We have taken a Safety Failure as:

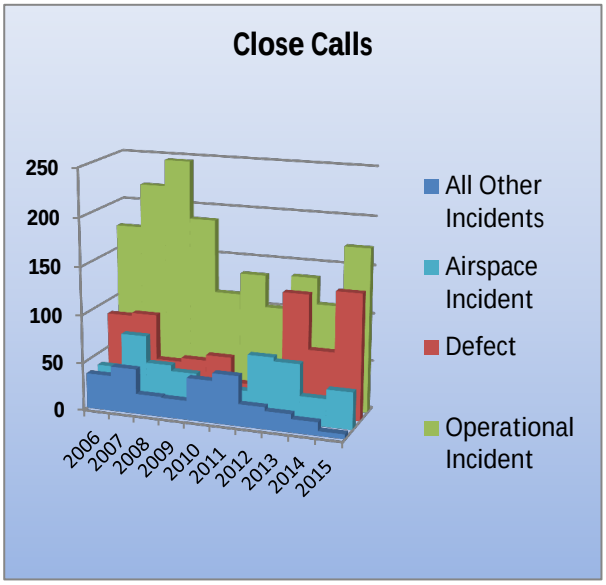
- an accident including hang glider and parachute or
- an incident where the aircraft is written off, destroyed or missing or
- a critical or major incident or
- an incident that has any of 31 selected descriptors, most of which relate to collision, serious landing outcomes, serious aircraft technical or operational failures or acts of violence

(Descriptor list to be included in appendix)

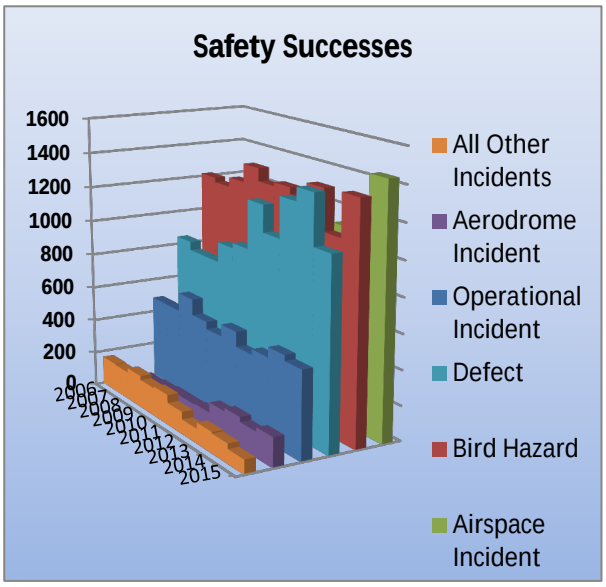


We have defined a Close Call as an incident that is not a safety failure but that has any of 112 selected descriptors that support the assumption that failure would have been the outcome if either the condition had escalated or adequate compensating action had not been taken.

(Descriptor list to be included in appendix)



We have defined a Safety Success as a reported incident (i.e. something unexpected) that was managed to a safe outcome using normal operational procedures



Safety Failures

Whilst the goal for Safety Failures must be continuous reduction, it is difficult to identify a clear trend because of the small population. It is worthy of note that the number of 'Other Critical or Major' incidents does seem to be declining in recent years. These 'Other' incidents are mostly (87%) made up of Defects, Operational Incidents and Airspace Incidents in that order of frequency.

Close Calls

No obvious patterns or trends are evident in the records of close calls and this may be simply a symptom of the part that luck plays in determining whether an incident becomes a safety failure of remains a close call. The apparent predominance of Airspace and Defect incidents is consistent with the overall reporting numbers for these incident types which are equally predominant in the Safety Success outcomes.

Precursors to Safety Failure

The CAA operates two processes that generate indicators of possible future safety failure of a particular activity type by a particular operator. They are the Client Risk Assessment and Routine Audit processes.

The Client Risk Assessment Process

This process generates a 'score' representing a weighted assessment of a range of factors all of which have the ability to indicate possible risk to an operation. A new score is generated any time any one of the relevant factors changes or if a manual assessment is initiated.

Client Risk Assessment scores are unique to a particular activity type and are not comparable between one activity and another.

The next table and graph show how the Risk Assessments have changed over the last 9 years. The table is ordered by the 2015 average risk score for the activity type.

Activity	Year ending 30 June								
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Part 175 Aeronautical Info Service Organisation	25.1	34.4	6.2	7.6	12.1	21.2	14.6	11.1	43.3
Part 125 Air Operator Medium Aeroplanes	24.3	18.3	14.0	15.3	16.1	12.8	14.2	13.8	16.3
* Part 149 Aviation Recreation Organisation	11.8	3.0	5.1	30.7	8.4	16.2	11.4	14.4	16.2
Part 137 Agricultural Aircraft Operator	33.7	26.5	19.0	16.6	16.3	15.5	15.6	14.6	15.1
Part 135 Air Operator Helicopters and Small Aeroplanes	28.7	22.0	17.4	16.7	15.9	15.8	15.3	13.9	14.5
* Part 173 Instrument Flight Procedure				5.9	8.2	15.4	13.0	11.1	13.5
* Part 172 Air Traffic Service Organisation	29.2	26.7	7.3	9.7	9.9	22.0	19.1	15.1	12.8
* Part 109 Regulated Air Cargo Agent			7.7	13.9	11.2	10.4	11.7	12.7	12.4
Part 115 Adventure Aviation Operator Certificate							30.6	13.2	12.2
Part 148 Aircraft Manufacturing Organisation	14.4	12.2	11.8	10.4	11.2	10.8	9.4	10.9	11.7
Part 145 Maintenance Organisation	14.8	12.0	10.7	10.8	10.3	11.1	9.4	9.8	10.3
Part 19F Supply Organisation	13.8	12.1	12.6	11.1	11.2	10.2	9.1	10.8	10.2
Part 141 Aviation Training Organisation	15.1	15.6	11.8	11.4	9.5	10.7	9.3	8.3	9.3
Part 146 Aircraft Design Organisation	12.2	12.3	9.0	7.6	11.8	10.2	9.4	8.2	8.8
Part 121 Air Operator Large Aeroplanes	13.8	10.9	9.5	10.5	10.0	7.8	8.0	8.2	7.6
Part 92 Dangerous Goods Packaging Approval Holder	2.6			2.6	5.6	10.9	5.1	8.4	7.4
Australia AOC with ANZA Privileges Part 108 Security Programme				5.5	5.9	7.0	6.1	5.6	7.4
Part 139 Aerodrome Operator	8.5	6.6	5.3	6.3	5.7	5.8	5.9	6.5	7.2
Part 108 Security Programme	7.8	7.9	7.7	8.3	7.5	7.1	7.0	6.4	6.9
Part 129 Foreign Air Transport Operator	9.2	12.9	10.6	8.2	8.9	9.6	8.3	6.8	6.4
Part 140 Aviation Security Service Organisation	29.7	11.0	4.7	5.5	4.5	4.8	5.0	6.1	6.1
Part 174 Meteorological Service Organisation	16.3	30.2	7.3	9.6	10.3	15.9	10.7	5.1	5.3
Part 171 Telecom Service Organisation	21.9	10.8	6.0	4.9	6.8	17.3	12.7	6.6	5.1

When a client is initially certificated their risk score is automatically high. It gradually declines as the client builds up operational experience. The very high rating of the single Part 175 client is entirely due to their lack of certification time. Their score is already decreasing over time. The Part 115 holders also illustrate this effect well. The four activity sectors marked with an asterisk are displaying significantly poorer scores than in some previous years.

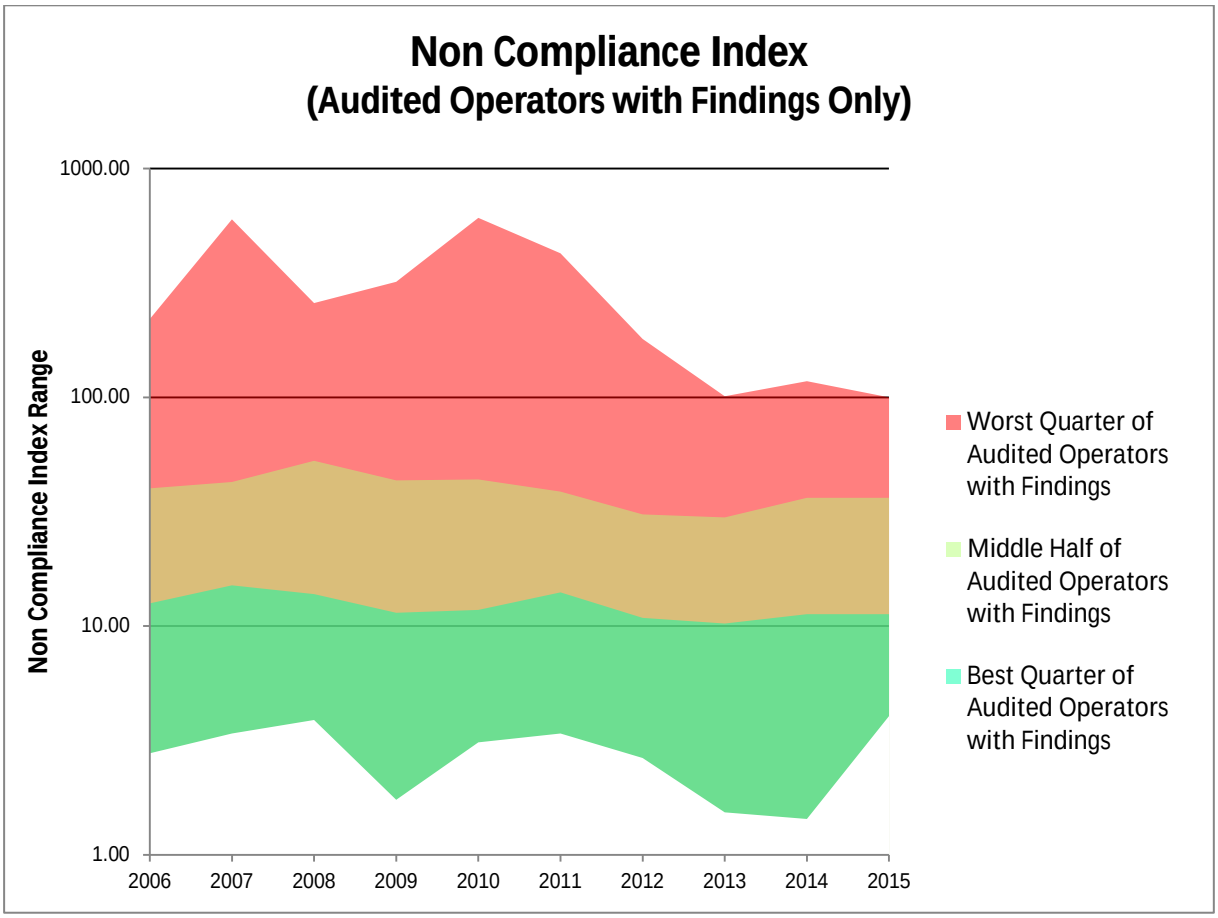
The Routine Audit Process

This process generates findings as a result of inspections of compliance with CAA rules. The number of findings and their severity divided by the number of hours spent on the inspection are used to generate a Non-Compliance Index.

The following chart shows the numbers of certificated operators. They are separated into those that have not been audited, those that have been audited and for whom no non-compliances were discovered and finally those for whom one or more non-compliances were discovered either as a result of an audit, an inspection or an investigation. The years run from 1 July of the preceding year to 30 June of the labelled year.

It is worth noting that as the CAA moves to risk-based auditing decisions, fewer operators are being audited each year. It is also worth noting that over the last three years only about half of the operators who are audited have generated findings. This is a change from earlier years when for most years significantly more than half of all audited operators generated findings.

The next chart shows how the non-compliance findings have been distributed across those clients that have been audited over the last 10 years. The chart plots a 'Non-Compliance Index' (NCI) which is a weighted measure of the number of non-compliances discovered divided by the number of hours spent on the audit process. The weighting factors used reflect the relative severity of the non-compliance and are 30 for a critical, 2 for a major and 1 for a minor finding. To help with interpreting this chart it may be worth noting that to generate an index of 100 an audit lasting 30 hours would need to discover one critical finding or alternatively 10 Major plus 10 Minor findings.



The most noticeable trend is the narrowing of the range of NCI values. Apparently the CAA is discovering fewer critical non-compliances in the last 3 years as compared to the time before 30 June 2012

Industry Size and Activity Data

Registered Aircraft

The following table summarises the number of registered aircraft or Part 115 approved aircraft as at 30 June 2015, one, three and nine years before that.

Aircraft Category and Class	Year Ending Jun 2015	One Year Ago	3 Years Ago	9 Years Ago
Large Aeroplane	**117**	127	126	123
Medium Aeroplane	**77**	77	79	73
Small Aeroplane	**1499**	1497	1525	1416
Helicopter	**828**	798	770	646
Agricultural Aeroplane	**93**	102	109	120
Sport Aircraft - Aeroplanes	**167**	159	136	94
Sport Aircraft - Amateur Built Aeroplane	**285**	285	270	205
Sport Aircraft - Amateur Built Glider	**3**	3	4	3
Sport Aircraft - Amateur Built Helicopter	**23**	24	22	12
Sport Aircraft - Balloons	**64**	61	72	58
Sport Aircraft - Glider	**283**	285	297	310
Sport Aircraft - Gyroplane	**57**	49	39	24
Sport Aircraft - Hang Glider	**18**	18	13	0
Sport Aircraft - Helicopter	**5**	4	5	8
Sport Aircraft - Microlight Class 1	**206**	212	222	251
Sport Aircraft - Microlight Class 2	**856**	823	809	604
Sport Aircraft - Power Glider	**47**	46	47	43
Sport Aircraft - Parachute	**204**	198	174	0
Sport Aircraft - Para Glider	**77**	67	35	0
Total	**4909**	**4835**	**4754**	**3990**

The totals need to be interpreted with care because the figures from 9 years ago did not include Hang Gliders, Parachutes of Para Gliders. Although most of these probably existed at that time they have only been recorded since the need to approve them for Part 115 operations arose in late 2011. Even now any private aircraft of these classes do not appear in the CAA records.

Significant growth areas are helicopters, sport aeroplanes, amateur built helicopters, gyroplanes and class 2 microlights.

Moderate declines are evident in the numbers of agricultural aeroplanes, gliders and class 1 microlights.

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 as at 30 June 2015, one, three and nine years before that.

Licences	Year Ending Jun 2015	One Year Ago	3 Years Ago	9 Years Ago
Recreational / Private - (RPL with Med or any Class2 Med only or any PPL only)	**6389**	6647	6973	5963
CPL with class 1 Med	**2046**	2098	2337	1844
ATPL with Class1 Med	**1228**	1223	1175	1058
ATC with Class 3 Med	**387**	381	374	296
LAME	**2754**	2699	2575	2114
Total	**12804**	**13048**	**13434**	**11275**

Note — the statistics above for pilot licences count only those with active medical certificates of a class appropriate for the licence type. 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 the totals therefore overestimate the number of licence holders, as each holder may hold more than one licence.

Operators (Owners)

The following table summarises the number of registered operators of aircraft on the register as at 30 June 2015, one, three and nine years before that.

Aircraft Category	Year Ending Jun 2015	One Year Ago	3 Years Ago	9 Years Ago
Large Aeroplane Operators	**9**	11	11	14
Medium Aeroplane Operators	**34**	35	39	31
Agricultural Aeroplane Operators	**39**	39	46	48
Helicopter Operators	**393**	390	383	330
Small Aeroplane Operators	**1023**	999	1009	948
Sport Aircraft Operators	**1754**	1730	1717	1442

No attempt has been made to total these figures because many operators own aircraft from multiple categories making totals meaningless.

The most notable trends are a 19% drop in the number of agricultural aeroplane operators over the last ten years and a 19% increase in the number of helicopter operators over the same period.

Certificated Operators

The following table shows the number of Civil Aviation Rule Part certificate holders as at 30 June 2015, one, three and nine years before that.

Approval	Year Ending Jun 2015	One Year Ago	3 Years Ago	9 Years Ago
Part 109 Regulated Air Cargo Agent	**65**	65	63	0
Part 115 Adventure Aviation Operator	**28**	28	20	0
Part 119 Air Operator	**172**	179	181	171
Part 119 Air Operator - Pacific	**0**	0	0	3
Part 129 Foreign Air Operator	**28**	30	28	43
Part 137 Agricultural Aircraft Operator	**103**	99	99	117
Part 139 Aerodromes	**27**	25	26	26
Part 140 Aviation Security Service	**1**	1	1	1
Part 141 Aviation Training Organisation	**56**	53	57	49
Part 141 Restricted Training Organisation	**0**	0	0	0
Part 145 Aircraft Maintenance Organisation	**56**	58	67	54
Part 146 Aircraft Design Organisation	**14**	14	15	12
Part 148 Aircraft Manufacturing Organisation	**20**	20	23	21
Part 149 Aviation Recreation Organisation	**8**	8	9	6
Part 171 Aeronautical Telecommunication Service Organisation	**2**	2	2	3
Part 172 Air Traffic Service	**1**	1	1	1
Part 173 Instrument Flight Procedure Service Organisation	**2**	4	3	0
Part 174 Meteorological Service Organisation	**2**	2	2	2
Part 175 Aeronautical Information Service Organisation	**2**	1	1	2
Part 19 Supply Organisation Certificate of Approval	**60**	57	60	55
Part 92 Dangerous Goods Packaging Approval	**57**	52	57	35
Part 129/108 Security Programme	**20**	22	21	32
Part 119/108 Security Programme	**16**	18	18	19
Part 121 Large Aeroplanes	**7**	9	9	11
Part 125 Medium Aeroplanes	**13**	14	15	13
Part 135 Helicopters and Small Aeroplanes	**163**	168	171	158
Australian AOC Operating with ANZA Privileges	**2**	2	1	0
Synthetic Training Device (Airlines)	**14**	11	9	7
Synthetic Training Device (General Aviation)	**30**	28	33	14
Pilotless Aircraft Authorisation	**1**	5	0	0
Total	**970**	**976**	**992**	**855**

* Note:

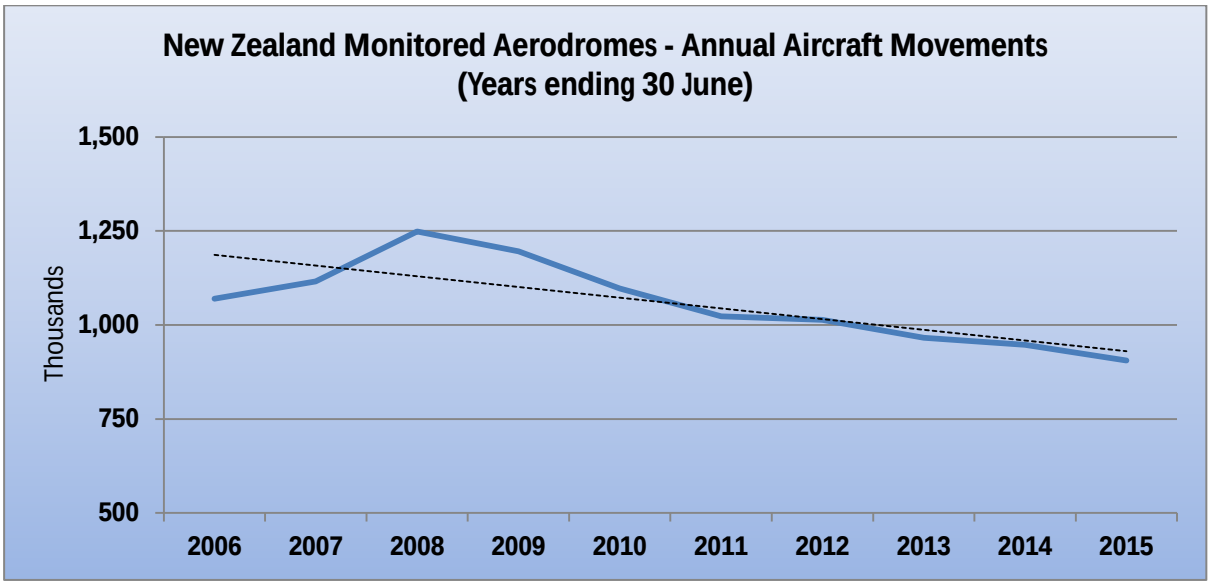
For organisations with Part 92 and for those with Part 172 certificates the figures show the total number of services that are certificated. This does not necessarily equate to the number of organisations that hold the certificate.

Aircraft Movements

Quarterly aircraft movement numbers are supplied to CAA 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.

Long-Term Change in Aircraft Movements

The following graph shows the annual number of aircraft movements for the ten-year period ending 30 June 2015. 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 following table shows 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.

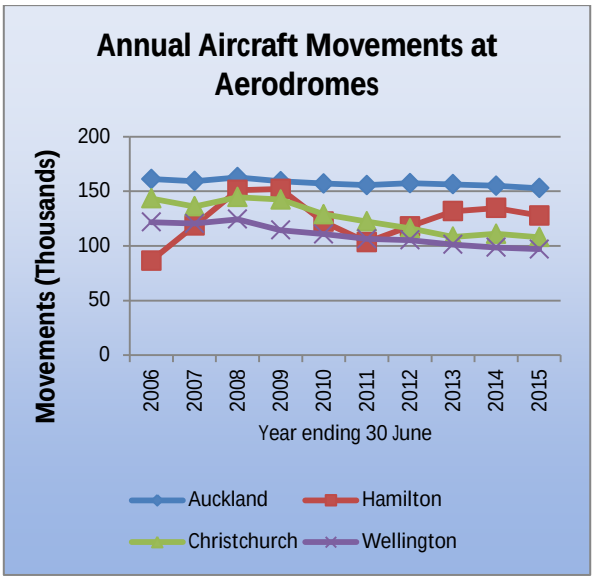
Annual Aircraft Movements at Aerodromes	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Auckland	161171	159287	162749	159157	157032	155609	157365	156405	155093	152792
Hamilton	86503	118626	151143	152062	122086	103408	117870	131795	134701	127861
Christchurch	143404	136151	144645	142434	128984	122352	116007	108259	111140	107996
Wellington	121717	120524	124399	114440	110817	106426	105323	101279	98601	97023
Palmerston North	53269	71875	94396	67646	55504	59476	68073	62881	53753	53534
Tauranga	90812	96011	104984	101664	93360	76784	72158	73193	64903	52590
Queenstown	54588	49080	50264	46471	44831	41406	43943	42070	43861	47991
Nelson	63597	51960	49381	48653	49813	50610	50295	46531	45139	45283
Ohakea	43301	56326	76069	75263	68597	56850	44154	27459	36007	28429
Paraparaumu					6305		30151	35639	23959	26055
Dunedin	27532	32044	49502	60995	46661	35213	28236	23300	23628	22412
Napier	24006	24173	26242	25965	25661	27725	25720	23963	24042	22371
Taupo	39378	33372	34102	32024	29370	27224	26558	24146	22976	21476
Woodbourne	24945	24236	26806	24317	22887	23703	23124	22077	21229	21416
New Plymouth	32928	34042	45731	43775	40578	34590	31687	27797	23402	21011
Rotorua	21462	24638	28583	24135	23331	22089	23100	22103	21204	19528
Invercargill	23764	24127	24810	25841	26251	29483	31268	25230	21468	17907
Gisborne	24282	25438	24157	24083	23279	22295	21563	18054	17149	15728
Milford	17940	17071	16933	14185	14426	13094	12931	13918	12836	15356
Whenuapai	14906	16925	13915	12918	13642	14981	14107	15145	15909	14711
Total	**1069505**	**1115906**	**1248811**	**1196028**	**1103415**	**1023318**	**1043633**	**1001244**	**971000**	**931470**

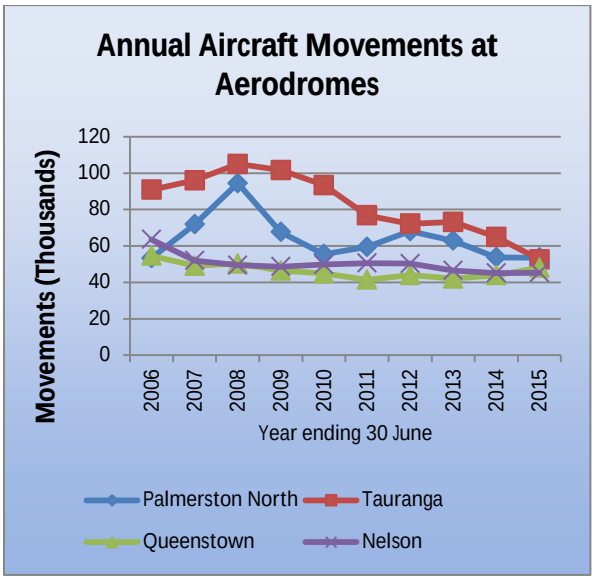
Movements data for individual aerodromes are graphed on the next page.

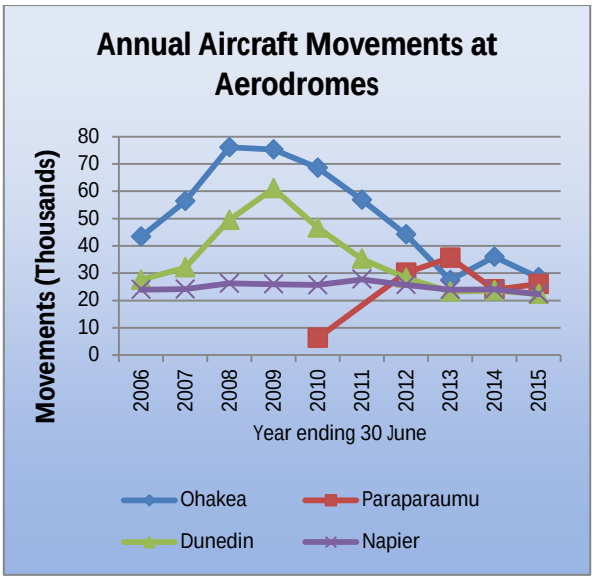
The aerodromes are grouped by the largest number of movements over the last year covered by this report

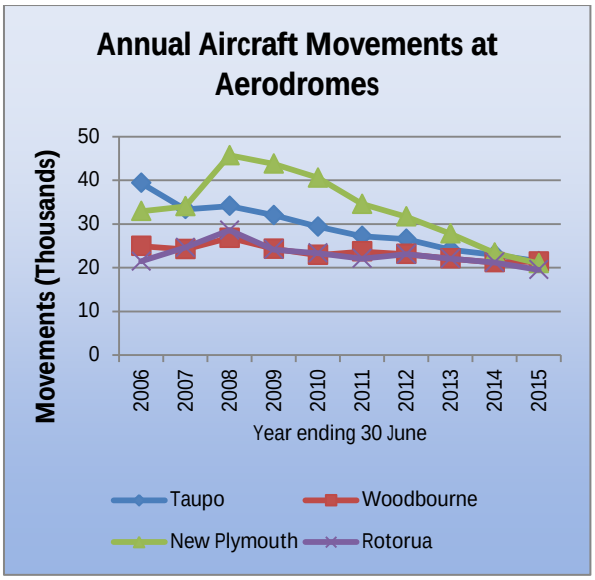
Note that the scales are different for each chart to prevent the smaller aerodromes' graphs from becoming unreadable which would happen if all the charts had the same scales.

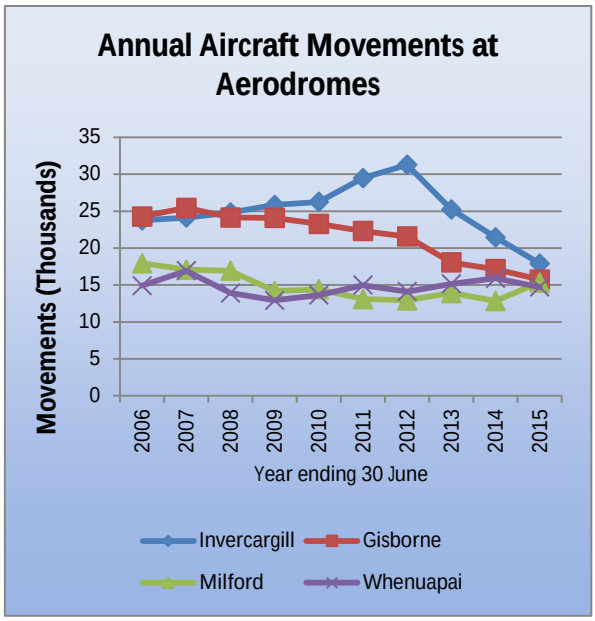
No information is available for Ardmore aerodrome although it is reported in the AIP as NZ's busiest aerodrome. The recent update of Part 139 requires all aerodromes that are published in the AIP to supply movement data so over time a wider picture of aerodrome movements should emerge.


Annual Aircraft Movements at Aerodromes
Movements (Thousands)
200
150
100
50
0
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year ending 30 June
Auckland
Hamilton
Christchurch
Wellington


Annual Aircraft Movements at Aerodromes
Movements (Thousands)
120
100
80
60
40
20
0
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year ending 30 June
Palmerston North
Tauranga
Queenstown
Nelson


Annual Aircraft Movements at Aerodromes
Movements (Thousands)
80
70
60
50
40
30
20
10
0
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year ending 30 June
Ohakea
Paraparaumu
Dunedin
Napier


Annual Aircraft Movements at Aerodromes
Movements (Thousands)
50
40
30
20
10
0
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year ending 30 June
Taupo
Woodbourne
New Plymouth
Rotorua

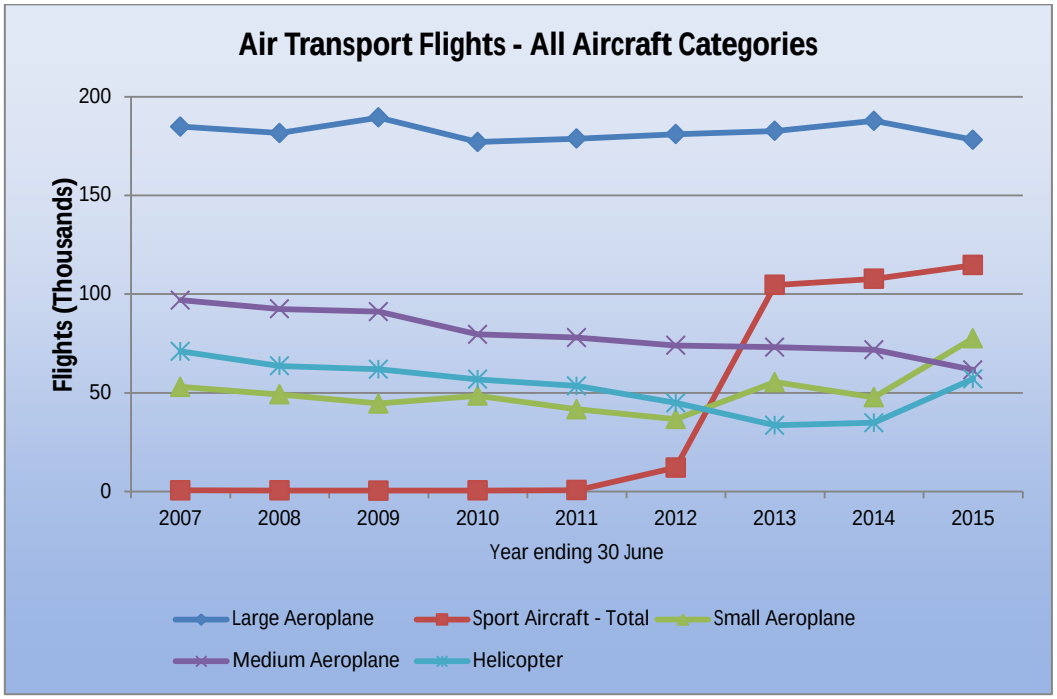

Annual Aircraft Movements at Aerodromes
Movements (Thousands)
35
30
25
20
15
10
5
0
2006 2007 2008 2009 2010 2011 2012 2013 2014 2015
Year ending 30 June
Invercargill
Gisborne
Milford
Whenuapai

Air Transport Flights

The following graphs show the estimated number of air transport flights for the nine years ending 30 June 2015. The estimates are based on the reported numbers of flights with an allowance for aircraft for which reports were not received.

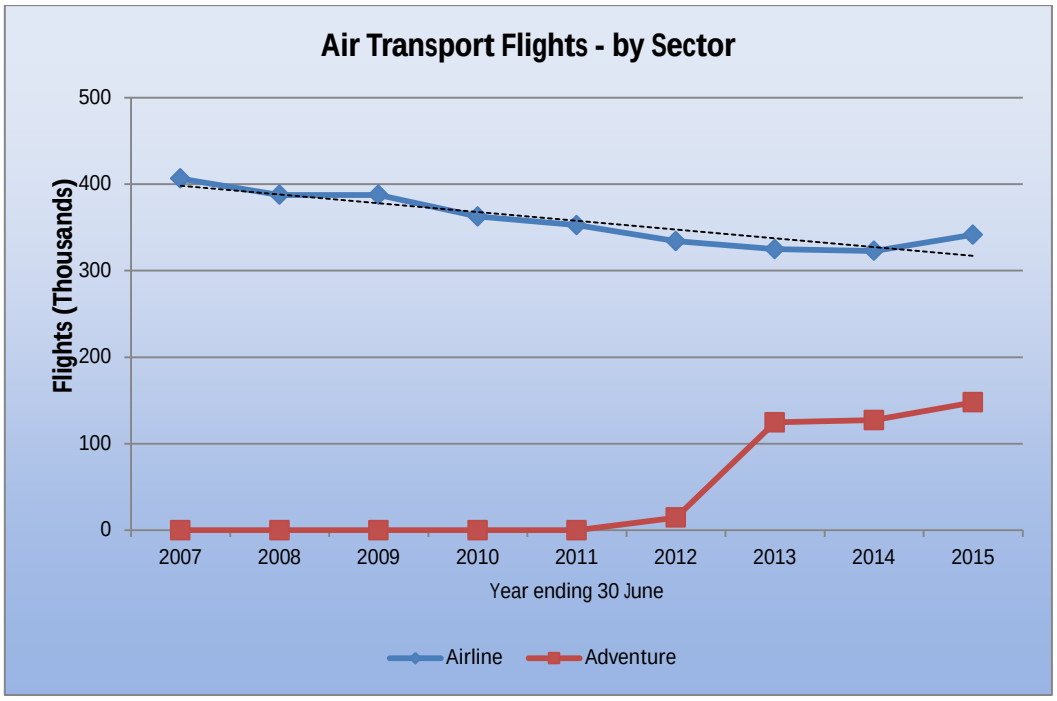
Note that these graphs exclude foreign registered aircraft that are operated in New Zealand.

Although the bulk of this report spans ten years, the data for Hours and Flights is limited to a nine year period. This is because the collection process changed in the 3rd quarter of 2005 and it is not feasible to include data from before that time.

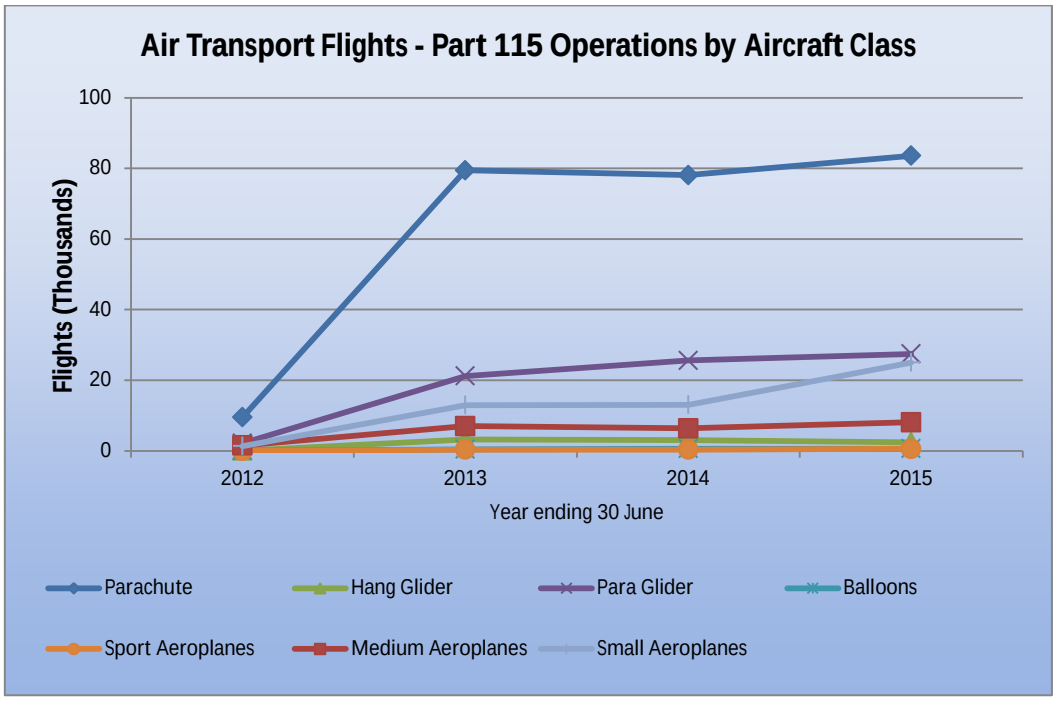


Apart from the expected emergence of adventure aviation flights the only trend that may be worthy of note is the 70% increase in helicopter air transport flights over the last two years. This is a reversal of a longer term declining trend that has persisted from 2006 to 2013. This change may be worth monitoring but it is important to remember that the reliability of the data for the final year of this report is always less than for the earlier years due to the late submission of data by some operators.

While it is expected that the Part 115 operations will not be reflected in the aerodrome movements data, it is interesting to note that the increase in airline sector flights in the last two years is also not seen in the aerodrome data. The increase is clearly seen in the small aeroplane and helicopter groups whose operations are less focussed around the monitored aerodromes than are the airlines operations.



The Airline graph shows a decrease of 16%. This trend is consistent with the decrease in the aerodrome movements of 15% over the last ten years



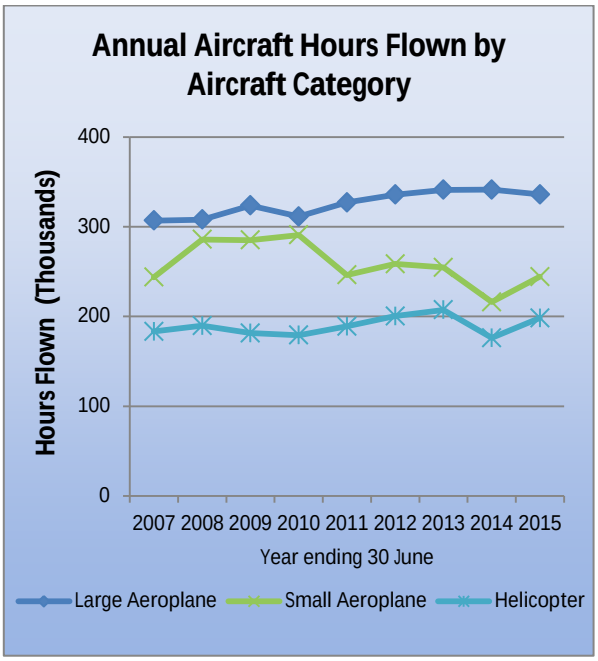
Because part 115 didn't come into force until 10 November 2011, the year ending 30 June 2012 represents less than a full year of operations. This data therefore should only be seen as representing industry growth from the 2013 year onwards.

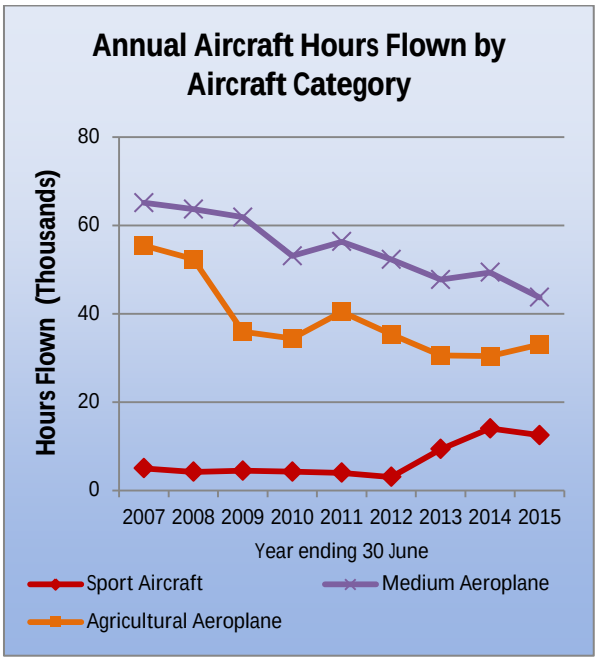
There are no obvious trends in activity levels yet.

Hours Flown

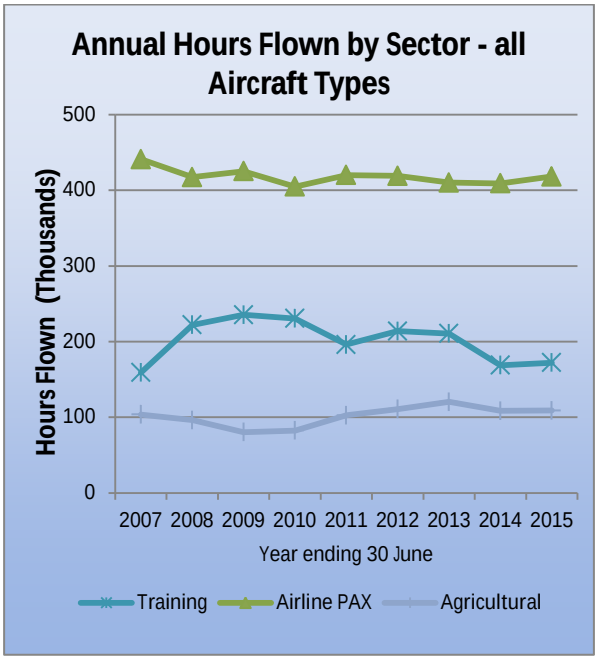
The following graphs show the estimated number of annual hours flown during the nine year period ending 30 June 2015. The estimates are based on the reported hours with an allowance for aircraft for which reports were not received. Recent improvements in the collection procedure for operating statistics data have resulted in improved return rates with a consequent improvement in confidence in the published data.

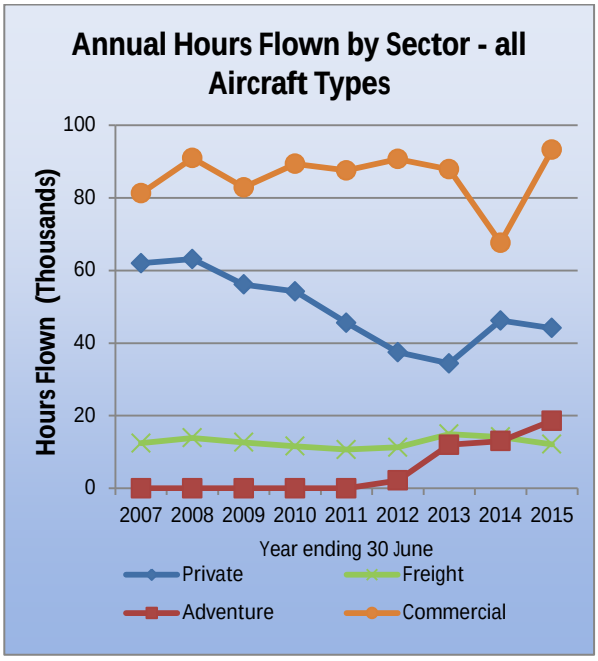
Note that these graphs exclude the aircraft statistics categories Sport Aircraft and Hang Gliders except where the aircraft are approved for use in Part 115 operations. Parachutes and foreign registered aircraft that are operated in New Zealand are also excluded.





Noteworthy is the decline in hours flown by Agricultural Aeroplanes from 52,000 in the year ending June 2008 to 36,000 one year later. This was possibly a consequence of the Global Financial Crisis and didn't trigger any intervention on the part of the CAA.





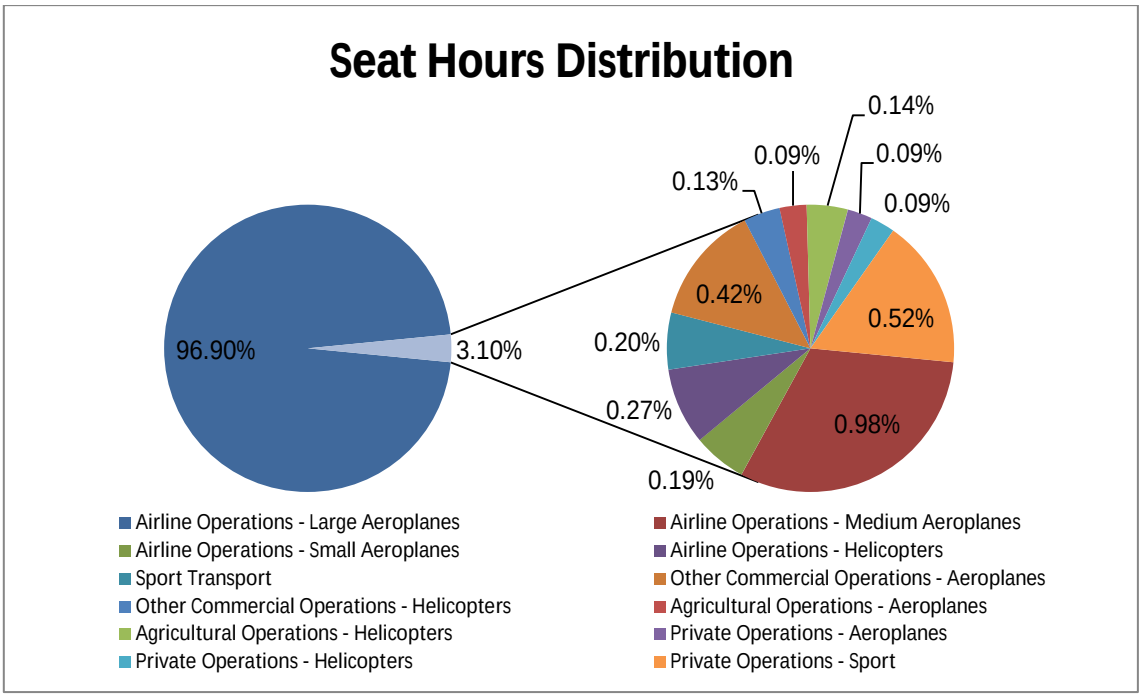
Seat-Hours

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 years ending 30 June. 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 seats.

The values in the table are thousands of seat hours.

Safety Outcome Target Group	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Airline Operations - Large Aeroplanes	38,391	38,562	44,747	47,028	45,232	47,504	48,779	49,556	49,588	**50,638**
Airline Operations - Medium Aeroplanes	570	544	786	764	656	696	732	679	581	**510**
Airline Operations - Small Aeroplanes	215	157	116	99	104	110	106	102	74	**98**
Airline Operations - Helicopters	151	154	138	126	112	128	132	123	118	**140**
Sport Transport	38	80	122	122	122	122	57	96	92	**104**
Other Commercial Operations - Aeroplanes	142	187	252	270	279	230	275	294	200	**218**
Other Commercial Operations - Helicopters	67	74	99	97	105	94	95	88	53	**66**
Agricultural Operations - Aeroplanes	53	59	53	35	37	45	51	43	44	**49**
Agricultural Operations - Helicopters	101	100	95	95	97	123	78	94	80	**75**
Private Operations - Aeroplanes	66	65	62	54	55	50	42	39	45	**45**
Private Operations - Helicopters	44	51	58	53	50	39	36	36	45	**45**
Private Operations - Sport	57	131	206	206	206	206	252	267	268	**273**

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.



This chart shows that for the year ending June 2015 approximately 96.9% 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 2.1% of seat hours offered being split between the other safety target groups.

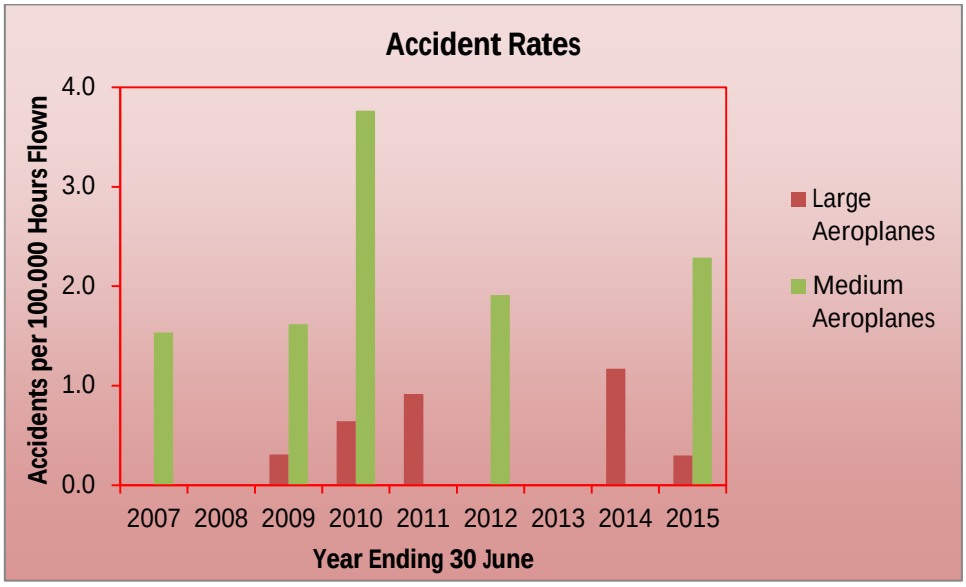
By comparison the 336,000 hours flown by the 117 large aircraft is similar to the 244,000 hours flown by the 1499 small aeroplanes on the register. The difference in passenger exposure is largely a function of the seating capacity.

Occurrence Analysis

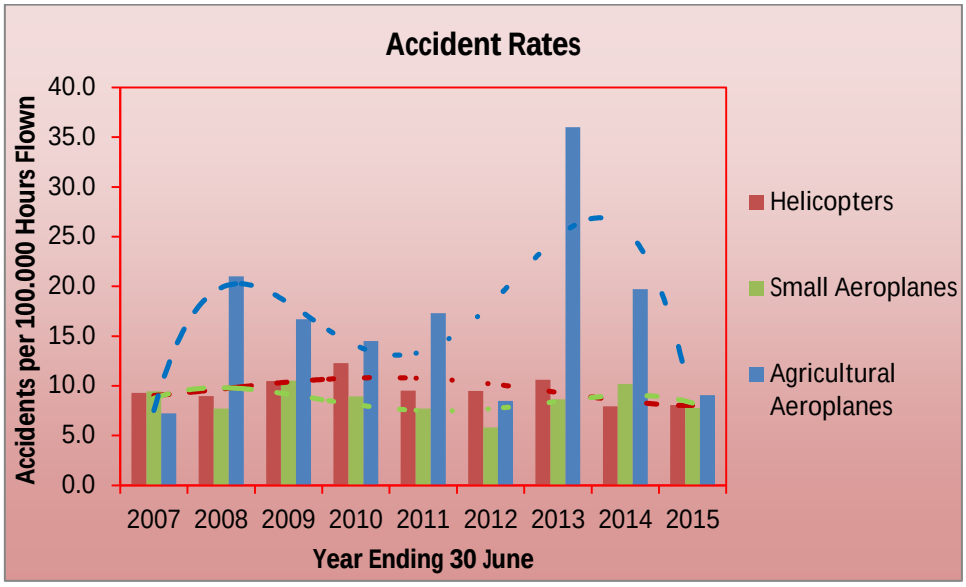
Aircraft Accidents

The following graphs show the annual aircraft accident rates (accidents per estimated 100,000 hours flown) for the nine-year period ending 30 June 2015 (excluding the Sport Aircraft statistics category).

Breakdown by Aircraft Category

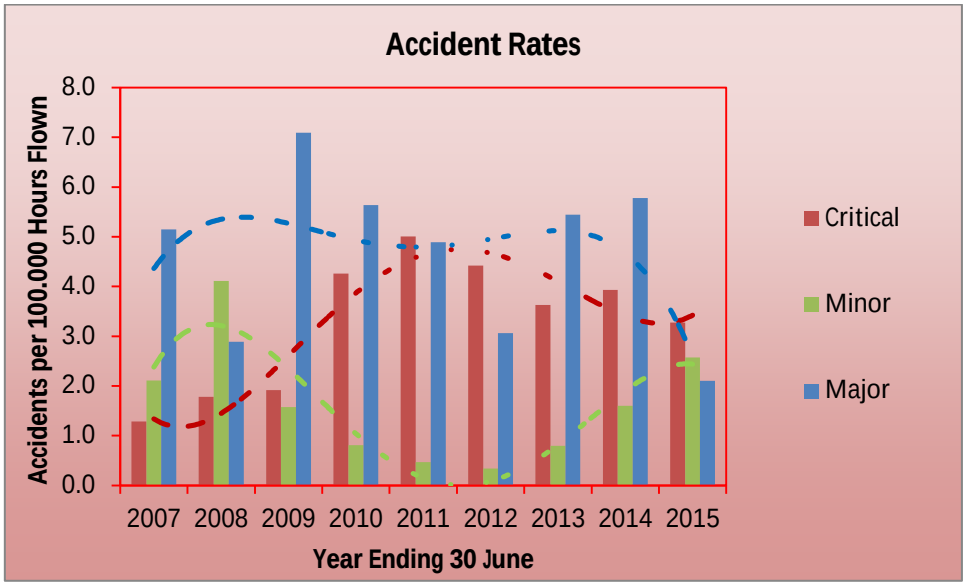


The numbers and rates of accidents in these two aircraft categories are too small for any trend analysis to be useful



Trends are indicated by dashed lines colour coded the same as the corresponding aircraft categories. Note the cyclic nature of the trend line for the accident rate for Agricultural Aeroplanes.

Breakdown by Severity



The definitions of Accident and Severity (see Appendix) are such that Minor accidents are relatively unlikely to occur so the recent resurgence in their numbers is noteworthy.

Yearly Comparisons – counts, not rates

The tables below show the numbers of reported accidents broken down by aircraft type and accident severity.

Critical Accidents

Aircraft Type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Large Aeroplanes	0	0	0	0	0	0	0	0	1	**0**
Medium Aeroplanes	2	1	0	0	1	0	0	0	0	**0**
Small Aeroplanes	6	2	6	5	8	9	7	7	7	**6**
Helicopters	6	6	3	5	6	16	14	10	8	**14**
Sport Aircraft excluding Hang Gliders and Parachutes	2	1	4	5	19	17	17	11	14	**7**
Hang Gliders	2	3	1	6	5	4	7	8	5	**6**
Parachutes	1	2	0	0	3	2	4	3	4	**4**
Agricultural Aeroplanes	2	0	2	2	3	1	1	3	2	**1**
Unknown	0	1	1	0	0	0	0	1	0	**0**
Total	**21**	**16**	**17**	**23**	**45**	**49**	**50**	**43**	**41**	**38**

Major Accidents

Aircraft Type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Large Aeroplanes	0	0	0	0	0	2	0	0	2	**0**
Medium Aeroplanes	0	0	0	1	0	0	1	0	0	**1**
Small Aeroplanes	5	18	5	20	16	10	7	13	11	**6**
Helicopters	11	9	12	13	16	2	5	12	5	**1**
Sport Aircraft excluding Hang Gliders and Parachutes	11	12	5	27	15	22	11	15	25	**8**
Hang Gliders	4	6	2	6	8	4	2	2	4	**1**
Parachutes	0	2	1	3	2	3	7	4	1	**1**
Agricultural Aeroplanes	1	4	4	2	2	4	2	8	2	**2**
Unknown	1	1	0	0	0	2	1	0	2	**0**
Total	**33**	**52**	**29**	**72**	**59**	**49**	**36**	**54**	**52**	**20**

Minor Accidents

Aircraft Type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Large Aeroplanes	0	0	0	1	2	1	0	0	1	**1**
Medium Aeroplanes	0	0	0	0	1	0	0	0	0	**0**
Small Aeroplanes	4	3	11	5	2	0	1	2	4	**7**
Helicopters	3	2	2	1	0	0	0	0	1	**1**
Sport Aircraft excluding Hang Gliders and Parachutes	14	13	19	4	2	1	1	5	4	**13**
Hang Gliders	5	4	7	5	12	5	0	3	3	**17**
Parachutes	1	3	0	3	1	2	0	2	3	**2**
Agricultural Aeroplanes	2	0	5	2	0	2	0	0	2	**0**
Unknown	1	0	0	1	0	0	1	0	1	**0**
Total	**30**	**25**	**44**	**22**	**20**	**11**	**3**	**12**	**19**	**41**

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 last ten one year periods ending 30 June 2015. All aircraft types are included. The table is sorted by the number of accidents in the year ending June 2015.

Safety Outcome Target Group	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Private Operations - Sport	37	40	40	47	56	54	42	52	57	**49**
Sport Transport	4	9	0	12	12	11	10	4	7	**12**
Private Operations - Aeroplane	7	10	4	18	9	5	7	12	11	**10**
Other Commercial Operations - Aeroplane	7	11	16	9	12	11	5	7	10	**6**
Other Commercial Operations - Helicopter	3	7	4	6	3	7	8	4	4	**6**
Agricultural Operations - Helicopter	6	4	4	6	5	3	7	4	4	**5**
Private Operations - Helicopter	9	6	8	3	11	7	2	8	1	**4**
Agricultural Operations - Aeroplane	5	4	11	6	5	6	3	11	6	**3**
Airline Operations - Small Aeroplanes	3	1	2	3	3	3	1	2	1	**2**
Airline Operations - Large Aeroplanes	0	0	0	2	2	3	0	0	4	**1**
Airline Operations - Medium Aeroplanes	1	1	0	0	2	0	1	0	0	**1**
Airline Operations - Helicopter	2	0	1	4	3	1	2	6	5	**1**
Other	0	0	0	1	1	1	2	1	2	**0**
Total	**84**	**93**	**90**	**117**	**124**	**112**	**90**	**111**	**112**	**100**

Not all accidents generate equal consequences and the usefulness of the above data for focussing intervention decisions is limited. The ‘Sport Transport’ group ranks 2nd in this data but when consequential factors like fatalities, serious injuries and aircraft damage are taken into account the ranking changes to 8th as can be seen from the next section.

Social Cost

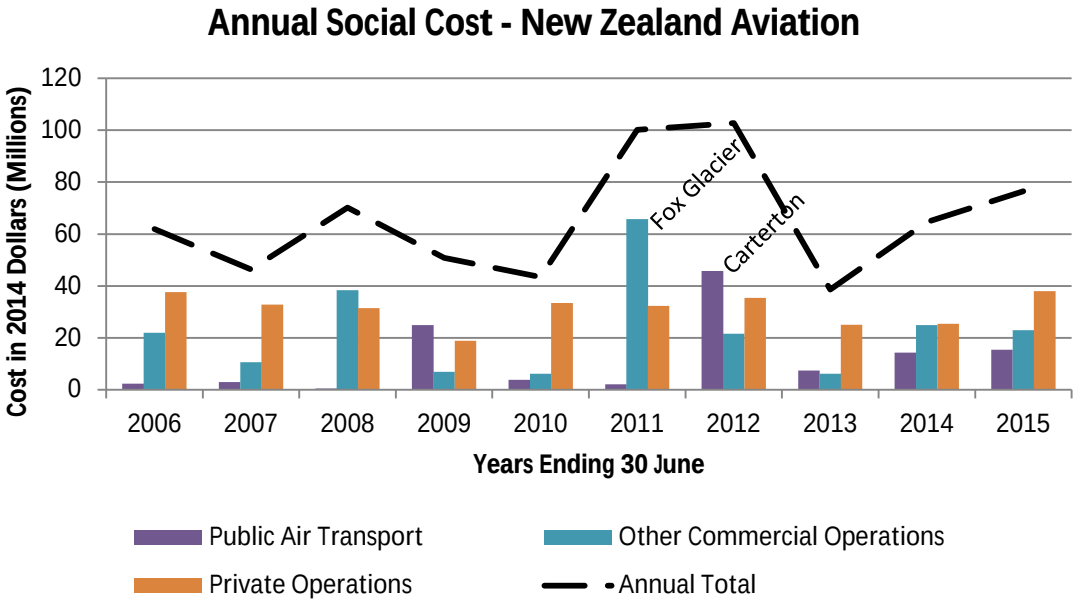
Social cost is a measure of the cost of fatal, serious and minor injuries and aircraft destroyed. The measure has been developed and maintained by the Ministry of Transport, and is updated annually. The following table displays the social cost expressed in in millions of 2014 dollars for each safety target group for the last ten one year periods ending 30 June 2015. The table is sorted by the social cost in the year ending 30 June 2015.

Safety Outcome Target Group	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Private Operations - Aeroplane	8.8	8.5	0.0	1.4	8.3	0.2	6.4	0.4	4.1	**17.5**
Other Commercial Operations - Helicopter	0.0	5.9	11.5	0.8	0.0	18.6	15.9	0.4	0.9	**16.3**
Private Operations - Sport	4.8	23.6	30.4	13.2	23.4	24.1	29.0	19.4	13.0	**15.1**
Airline Operations - Helicopter	0.0	0.0	0.0	2.5	1.3	0.4	0.4	5.9	9.0	**7.6**
Agricultural Operations - Helicopter	0.7	4.3	1.6	1.1	0.0	1.3	5.6	0.0	10.9	**5.9**
Private Operations - Helicopter	24.0	0.7	1.0	4.3	1.7	8.1	0.0	5.3	8.3	**5.5**
Airline Operations - Small Aeroplanes	0.0	0.0	0.0	0.2	0.6	0.0	0.2	0.7	1.0	**5.0**
Sport Transport	1.7	2.9	0.0	22.2	1.8	1.7	45.1	0.7	0.9	**2.8**
Agricultural Operations - Aeroplane	12.6	0.3	7.3	4.9	1.7	0.0	0.0	5.7	1.8	**0.7**
Airline Operations - Large Aeroplanes	0.0	0.0	0.4	0.1	0.0	0.0	0.1	0.1	3.4	**0.1**
Other Commercial Operations - Aeroplane	8.7	0.0	18.0	0.2	4.5	45.8	0.2	0.2	11.3	**0.0**
Airline Operations - Medium Aeroplanes	0.7	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	**0.0**
Other	0.0	0.0	0.0	8.0	0.0	0.0	0.0	8.3	0.0	**0.0**
Total	**61.9**	**46.3**	**70.2**	**58.8**	**43.4**	**100.1**	**102.8**	**46.9**	**64.7**	**76.4**

The extreme value of 102.8 million dollars in the year ending 30 June 2012 is largely a result of a multiple fatality accident in the ballooning sector. The next largest and also an extreme value is 100.1 million dollars in the year ending 30 June 2012 which is also largely a result of a multiple fatality accident in the commercial parachuting sector. The current year (ending 30 June 2015) is otherwise the highest of the ten years reported here, the biggest contributing sectors being the ‘Other Commercial - Helicopter’ and ‘Private’ (non- helicopter) sectors.

The following charts show the annual social cost for each Safety Outcome Target Group for the ten year period ending 30 June 2015. Note that the Sport groups include hang gliders and parachutes. These charts show the same data as the table above but are intended to give a more visual perspective on the Safety performance of the industry as measured by the Social Cost.

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

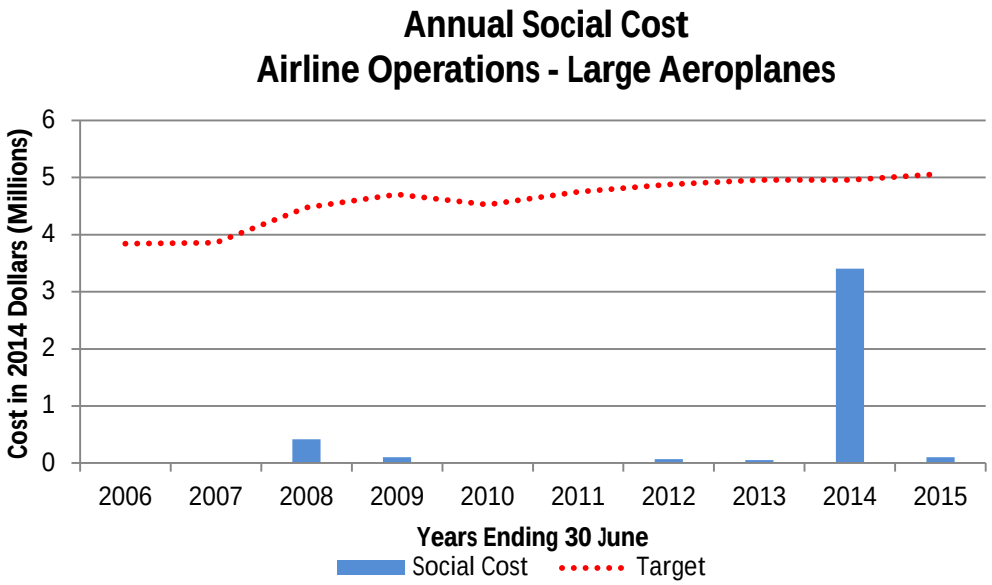


Clearly the Private Operations group is where our recent major safety failures have occurred.

The next charts show the breakdowns by individual Safety Outcome Target Group.

Each chart also shows the social cost target for the group. These targets were set in 2005 as a 'social cost dollars per seat-hour flown' value. For the graphs below these target figures have been scaled by the seat hours estimated to have been flown within the group and adjusted by the general consumer price index for the intervening years.

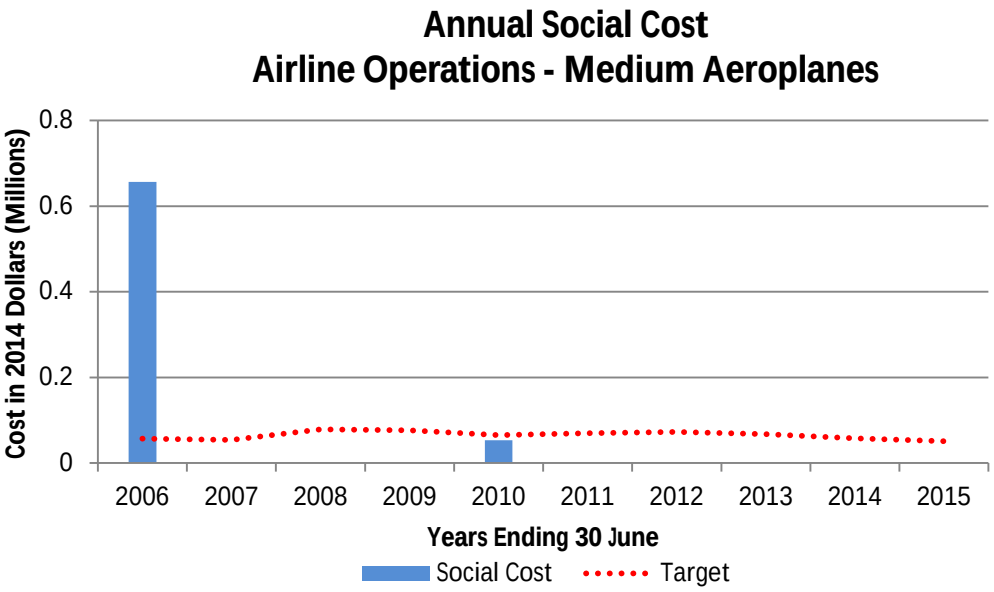
Each chart is followed by a table showing the numbers of injuries or events that contributed to the social cost.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	0	0	0	0	0	0	0	0	0	0
Serious Injuries	0	0	1	0	0	0	0	0	3	0
Minor Injuries	1	1	0	6	0	0	4	3	7	6
Aircraft Unusable	0	0	0	0	0	0	0	0	1	0

The most significant contribution was one aircraft written off in 2014

Because of the number of seats offered within this group the potential exists for an event to be catastrophic. Accordingly the operators give priority to safety and the CAA maintains relatively tight surveillance. The result is a level of safety well within the target level.

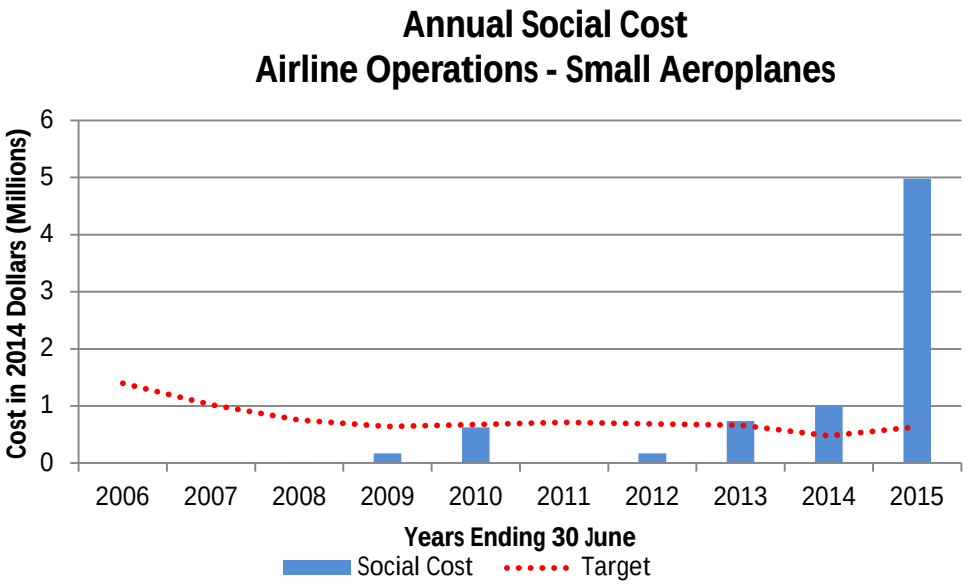


	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	0	0	0	0	0	0	0	0	0	0
Serious Injuries	0	0	0	0	0	0	0	0	0	0
Minor Injuries	1	0	0	0	3	0	0	0	0	0
Aircraft Unusable	1	0	0	0	0	0	0	0	0	0

The most significant contributions were an aircraft written off in 2006 and three minor injuries in 2010

Because of the number of seats offered within this group the potential exists for an event to be catastrophic. Accordingly the operators give priority to safety and the CAA maintains relatively tight surveillance. The result is a level of safety well within the target level.

The much lower level of activity within this sector (1.3% of all the seat-hours in the industry) means that a single event has the ability to cause the social cost to exceed the target in the year the event occurred. This is not seen as a problem as long as the target is met on average over an extended period.

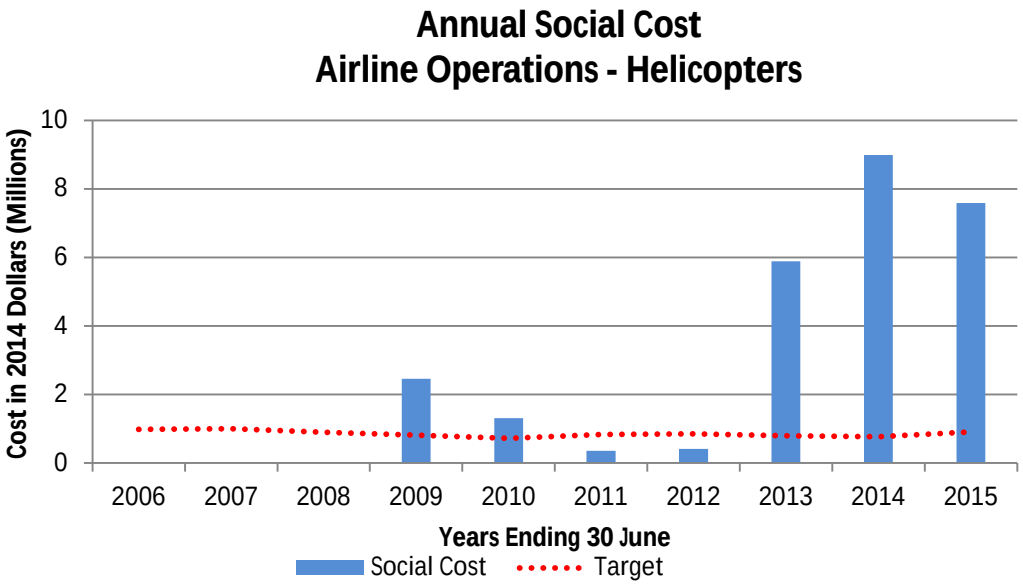


	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	0	0	0	0	0	0	0	0	0	1
Serious Injuries	0	0	0	0	1	0	0	1	2	2
Minor Injuries	0	0	1	0	2	0	0	0	0	0
Aircraft Unusable	1	0	0	1	1	0	1	1	1	1

One fatality in 2015 is the major contributing factor in this group coupled with an average aeroplane write-off rate of 0.7 per year over the last ten years. Each of the last four years has seen one write-off accident in this group. There were also 6 serious injuries 5 of which occurred in the last three years.

The recent safety trend in this group is a concern. This was one of the reasons for commencing the Part 135 sector risk profile, published November 2015.

Also social cost is increasing despite activity levels slowly declining within this group.

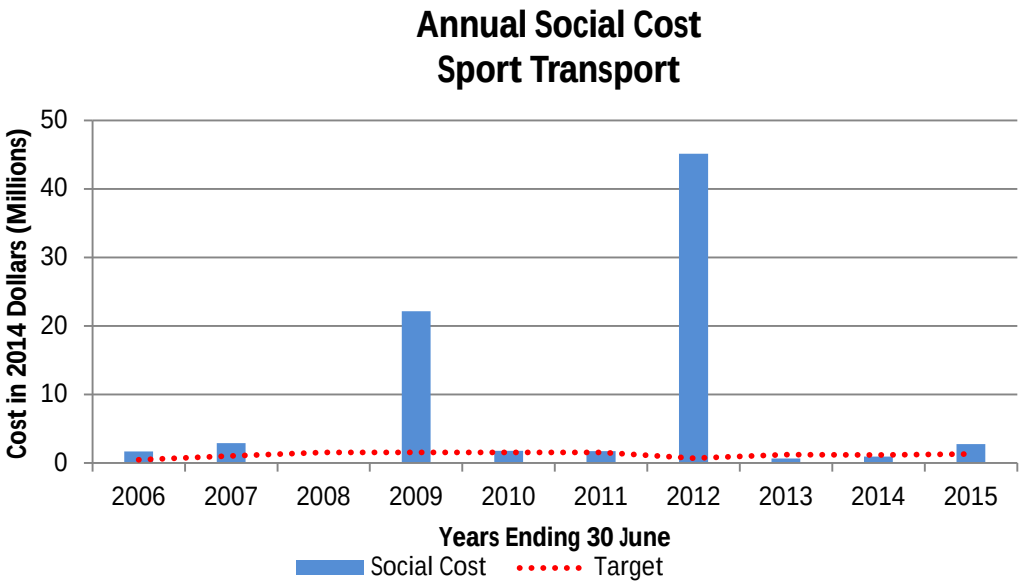


	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	0	0	0	0	0	0	0	1	1	1
Serious Injuries	0	0	0	2	0	0	1	0	1	4
Minor Injuries	0	0	0	2	2	2	0	0	7	2
Aircraft Unusable	0	0	0	2	1	1	0	1	3	1

This group has hosted three fatalities in the last ten years, one in each of the last three years. This coupled with three aircraft write-offs in the 2014 year and an increasing number of serious and minor injuries in the last two years means there is concern about the safety trend in this group.

The social cost target has been met in five of the last ten years but the last time was in the year ending June 2012

The helicopter sector has been identified as a priority area for the CAA in the 2016/17 strategic safety plan. This sector was also examined by the Part 135 Sector Risk Profile Published November 2015 on the CAA website.

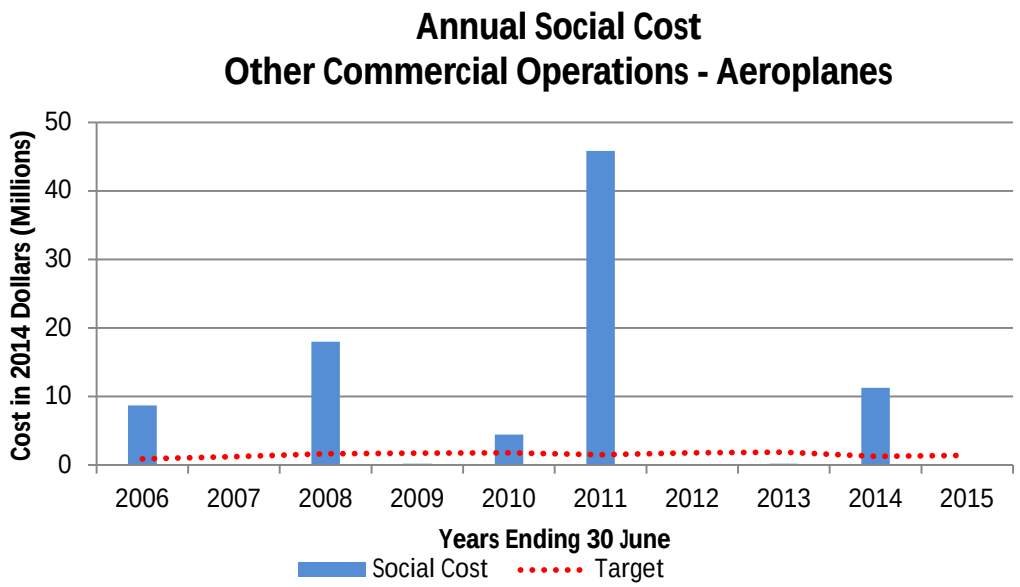


	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	0	0	0	5	0	0	11	0	0	0
Serious Injuries	4	7	0	5	3	5	3	1	2	4
Minor Injuries	2	0	1	4	5	6	4	5	6	9
Aircraft Unusable	0	0	0	3	1	1	1	1	0	1

Five fatalities in 2009 and eleven in 2012 dominate the safety performance of this group. The nature of the operations within this group is generally viewed as being less safe than in other groups and this is usually understood by customers and is reflected in the targets that are set.

The group has shown the capability of meeting the social cost targets in three of the last ten years and almost meeting them in a further two. The safety failures of 2009 and 2012 were all in different sub-sectors of this group, spanning microlight, glider, hang glider and balloon operations.

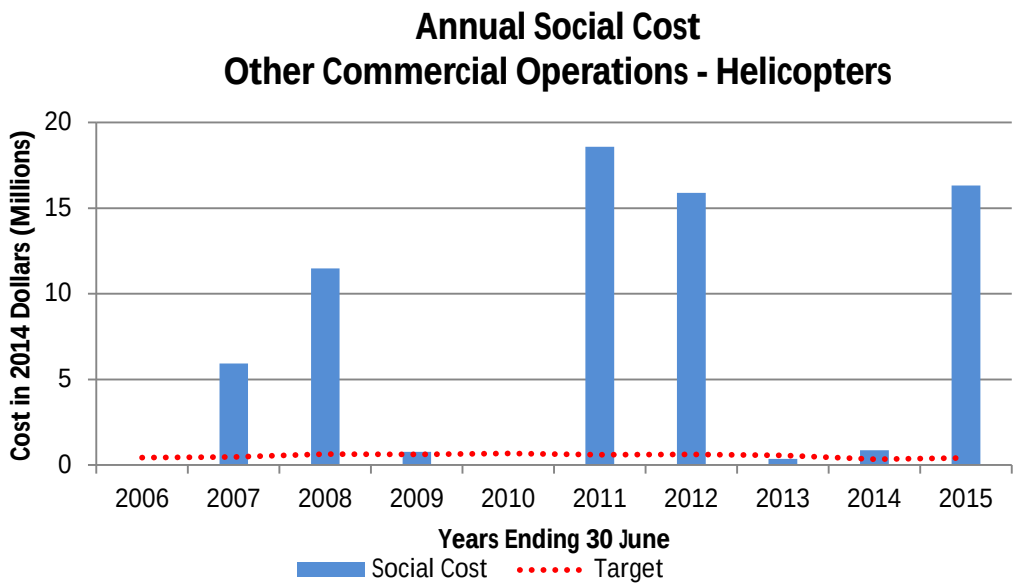
No common causal themes have been identified by subsequent investigations leading to the idea that safety procedures in this group may need to be more individually tailored than in other groups.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	2	0	4	0	1	11	0	0	2	0
Serious Injuries	0	0	3	0	0	2	0	0	6	0
Minor Injuries	4	2	1	1	0	0	0	1	0	0
Aircraft Unusable	4	0	5	1	3	4	1	1	5	0

The most noteworthy event in this group is an accident in the year ending 30 June 2011 in which five crew and four passenger fatalities occurred during a parachuting transport flight.

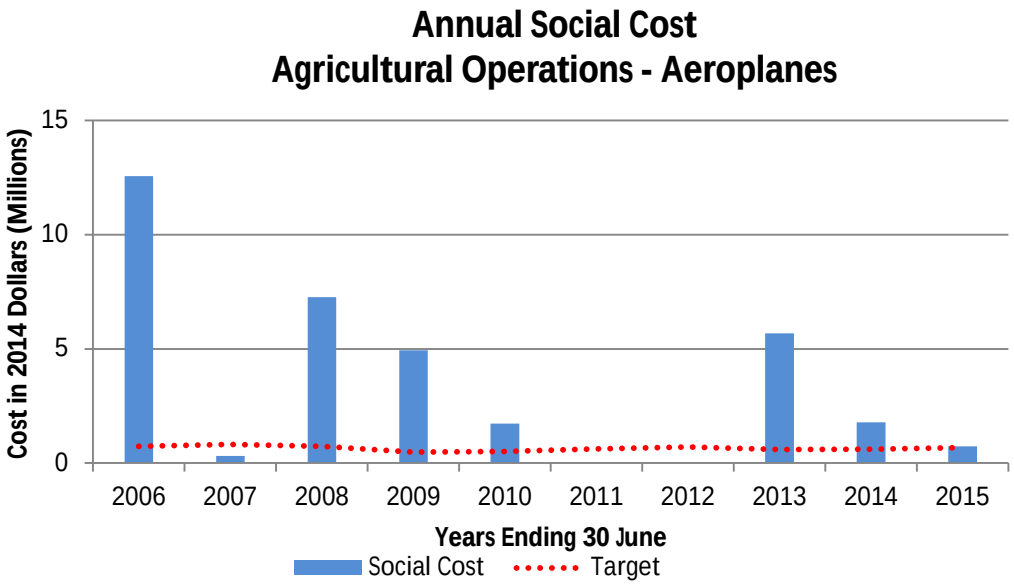
The low level of activity within this sector (0.6% of all the seat-hours in the industry) means that a single event has the ability to cause the social cost to exceed the target in the year the event occurred. This is not seen as a problem as long as the target is met on average over an extended period. This is not the case in this group.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	0	0	2	0	0	4	3	0	0	3
Serious Injuries	0	1	0	1	0	1	1	0	2	2
Minor Injuries	2	5	1	2	0	1	2	2	2	3
Aircraft Unusable	0	4	3	1	0	4	3	1	0	6

This group seems to display an almost cyclic pattern of safety failure. It is possible that economic pressures might influence behaviour but difficult to show any reliable correlation.

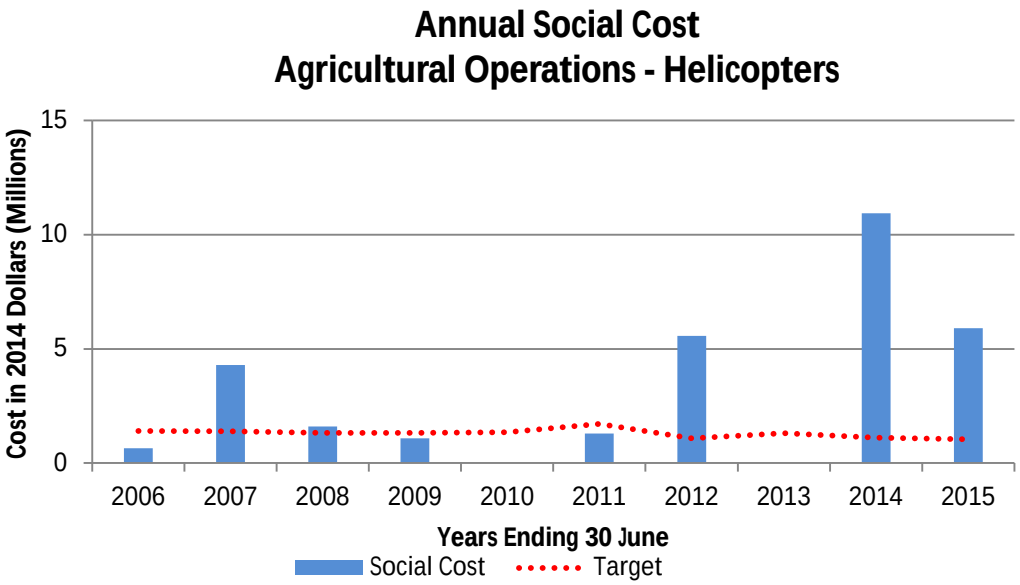
The low level of activity within this sector (0.2% of all the seat-hours in the industry) means that a single event has the ability to cause the social cost to exceed the target in the year the event occurred. This is not seen as a problem as long as the target is met on average over an extended period. This is not the case in this group.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	3	0	1	1	0	0	0	1	0	0
Serious Injuries	0	0	1	0	1	0	0	1	2	1
Minor Injuries	0	0	0	0	2	0	0	1	0	0
Aircraft Unusable	2	1	5	1	2	0	0	2	1	1

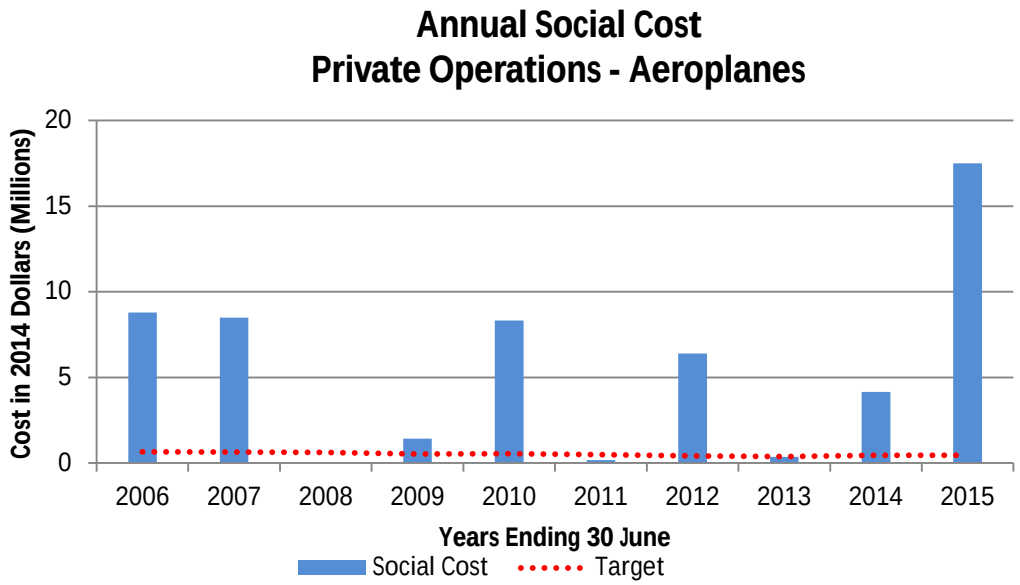
This group's safety performance is closely monitored and following significant safety failures the performance usually improves for a few years.

There is a steady long term downward trend in social cost



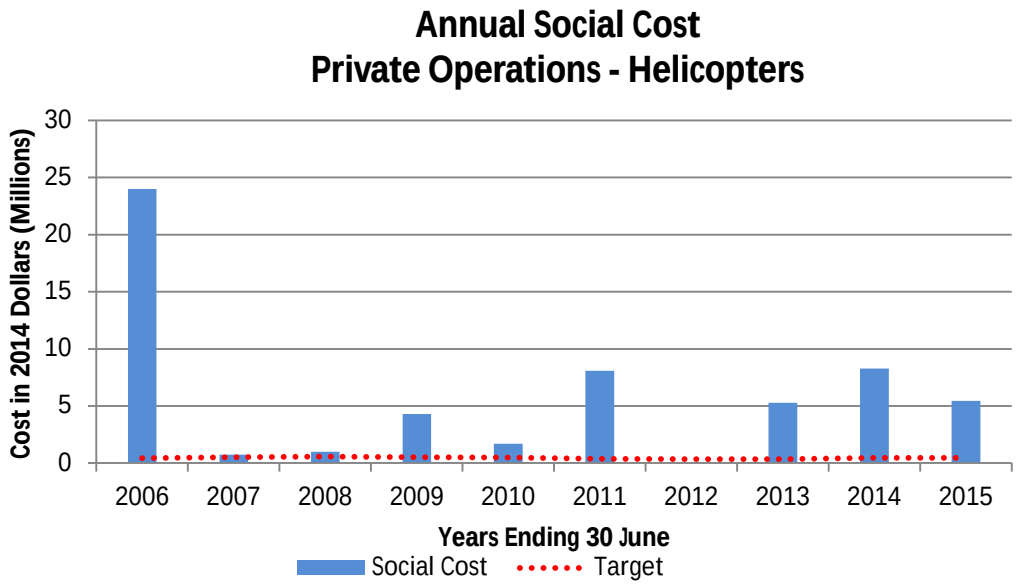
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	0	1	0	0	0	0	1	0	2	1
Serious Injuries	0	0	0	1	0	0	0	0	1	0
Minor Injuries	1	0	0	2	0	0	0	0	1	1
Aircraft Unusable	2	1	2	2	0	0	2	0	3	3

Although the absolute social costs of the safety failures in this group are on a par with those of the agricultural aeroplanes group, it must be remembered that this group operates about twice the number of hours of the aeroplane group. Nevertheless social cost increases in the last four years are a cause of concern especially in a climate of mildly decreasing activity level. Significant longer term interventions are in place with the support of the industry.



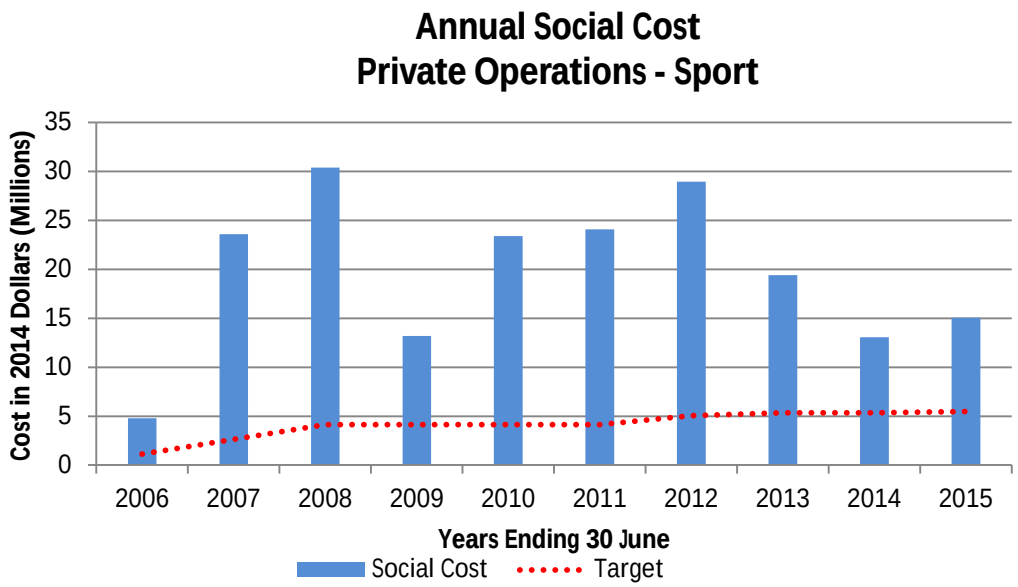
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	2	2	0	0	1	0	1	0	1	4
Serious Injuries	0	0	0	3	0	0	5	0	0	2
Minor Injuries	1	1	1	1	1	0	0	1	0	4
Aircraft Unusable	2	3	0	1	2	1	2	2	1	4

Until 2014 there was some optimism that the safety performance in this group was improving but the 2014 and 2015 results are trending the wrong way. The social cost target has been met or bettered on only three of the last ten years.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	5	0	0	1	0	1	0	1	2	1
Serious Injuries	2	0	0	0	0	3	0	0	0	2
Minor Injuries	6	6	2	0	5	1	0	2	0	1
Aircraft Unusable	5	2	3	1	2	5	0	4	1	2

Following three fatal accidents (five fatalities) in 2006 this group's safety performance improved significantly although the last three years are trending the wrong way.



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Fatalities	0	5	7	2	6	5	6	3	2	2
Serious Injuries	11	8	5	12	8	11	11	17	11	15
Minor Injuries	9	7	6	5	17	5	4	12	15	21
Aircraft Unusable	1	5	6	3	6	7	6	4	4	8

This group clearly stands out as the major contributor to the social cost in the private operations sector. The group includes the microlight, amateur-built, parachute and paraglider aircraft types and accordingly represents a large number of aircraft. The trend over the last four years has been one of improvement.

Flight Phase

The following table shows the flight phase recorded for accidents for the ten one year periods ending 30 June 2015. The figures include all aircraft types. The table is ordered by the 2015 values.

Flight Phase	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
LANDING	29	41	31	43	49	35	32	45	47	**41**
TAKEOFF	13	9	20	21	26	24	13	9	20	**17**
CRUISE	20	21	13	14	11	13	10	13	14	**13**
CLIMB	2	6	5	7	5	11	3	5	7	**6**
UNKNOWN	1	0	0	2	0	2	2	3	1	**5**
APPROACH	1	1	2	6	6	5	6	6	8	**4**
DESCENT	4	2	2	4	4	4	2	7	2	**4**
AGRICULTURAL MANOEUVRES	1	1	2	2	5	2	2	3	2	**4**
TAXIING	5	1	5	5	3	5	3	3	4	**3**
HOVER	2	1	3	2	6	1	5	3	2	**2**
CIRCUIT	1	1	1	1	0	1	1	0	0	**1**
Not Recorded	0	6	2	5	6	7	6	4	3	**0**
PARKED	2	2	3	5	3	2	4	8	0	**0**
HOLDING	0	0	1	0	0	0	0	0	0	**0**
HOVER TAXI	3	1	0	0	0	0	0	2	1	**0**
AEROBATICS	0	0	0	0	0	0	1	0	1	**0**

The most common phase of flight during which accidents occurred in the year ending 30 June 2015 was the Landing phase (41%). This proportion of accident by flight phase is largely unchanged from previous years and reflects the fact that landing is the highest risk phase of flight.

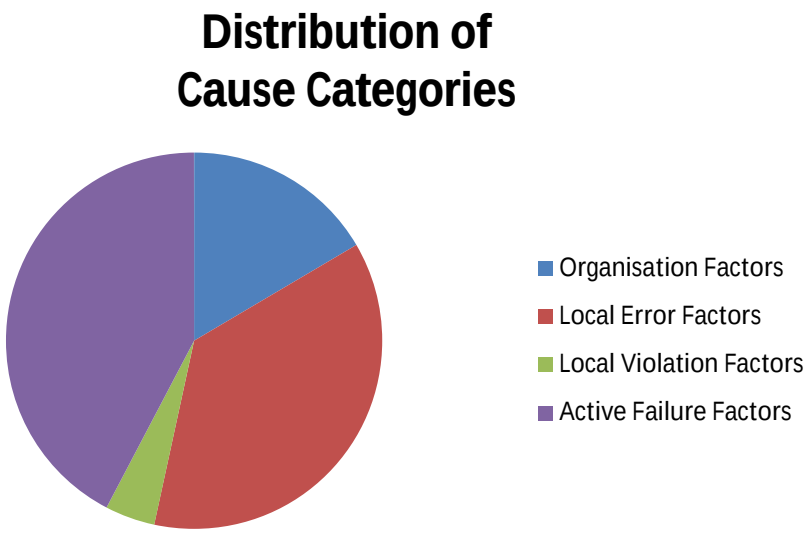
The most common event descriptor associated with Landing phase accidents during the year ending 30 June 2015 was 'Other' (15%). The ranking of this descriptor is unusual, the descriptor ‘Hard Landing’ having been the most common for many years.

The most common cause (at 37%) recorded for Landing phase accidents during the year ending 30 June 2015 was ‘Active Failure Factors - ACTIONS INCONSISTENT WITH PROCEDURES’'

Accident Causal Factors

442 causal factors have been assigned to 405 (43%) of the 949 accidents that were reported as occurring during the ten years ending 30 June 2015.

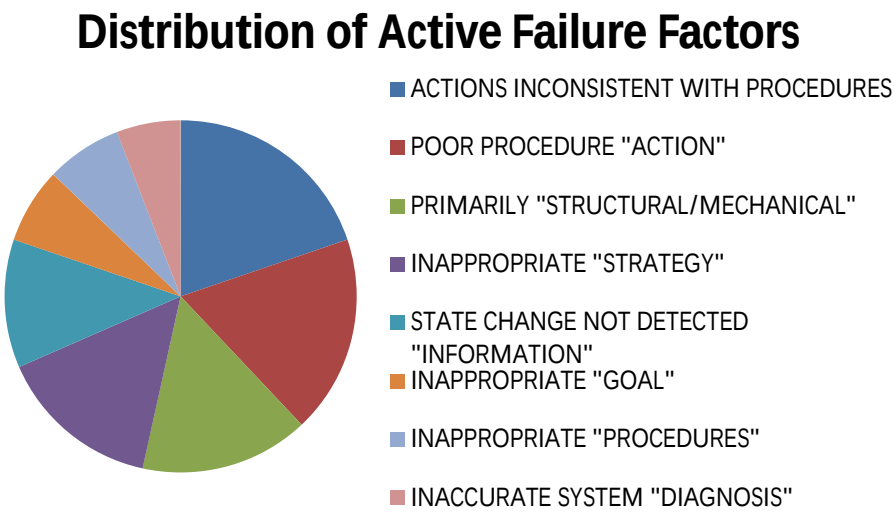
The following chart shows the distribution of cause categories (groupings of causal factors) recorded for those accidents.



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.

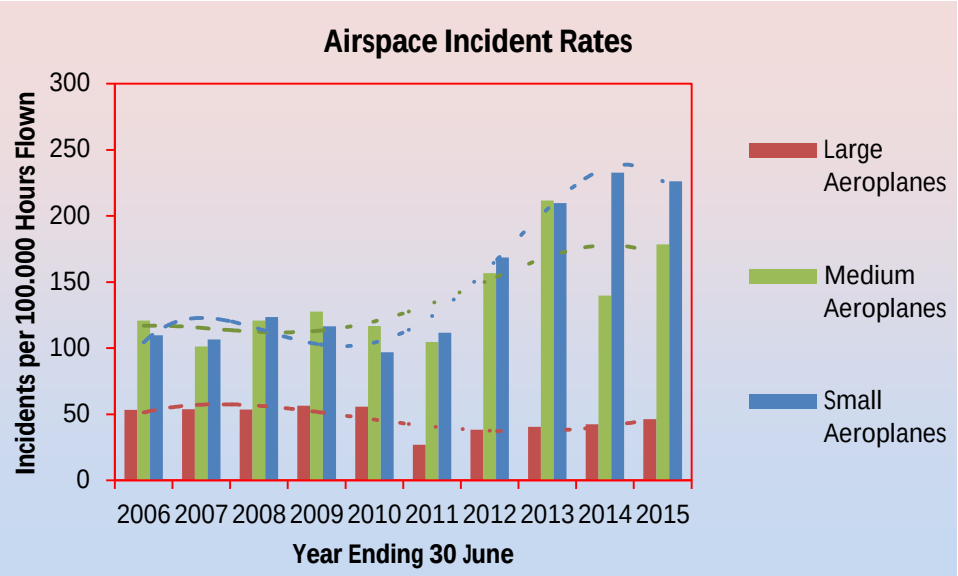
The following chart shows the distribution of Active Failure causes during the same period as above.

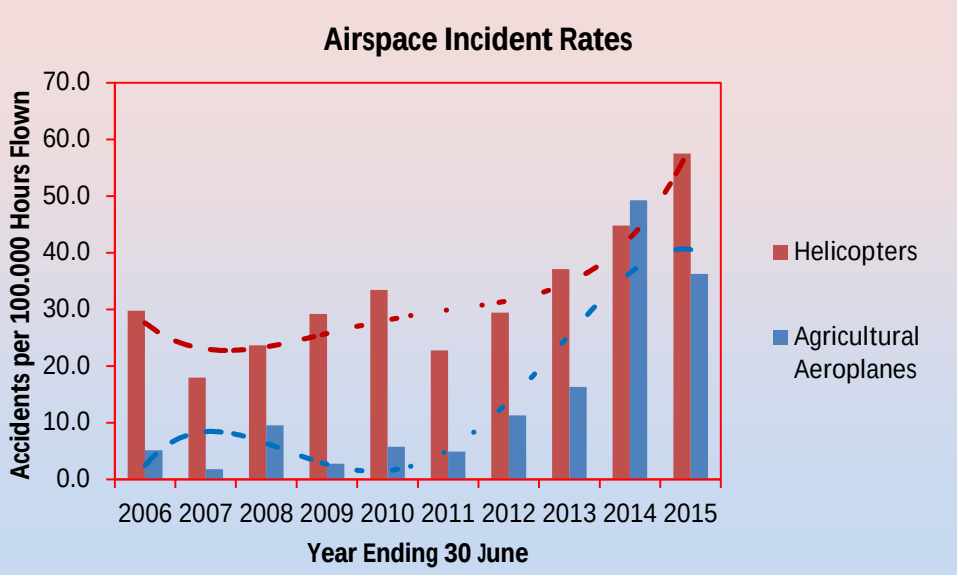


Airspace Incidents

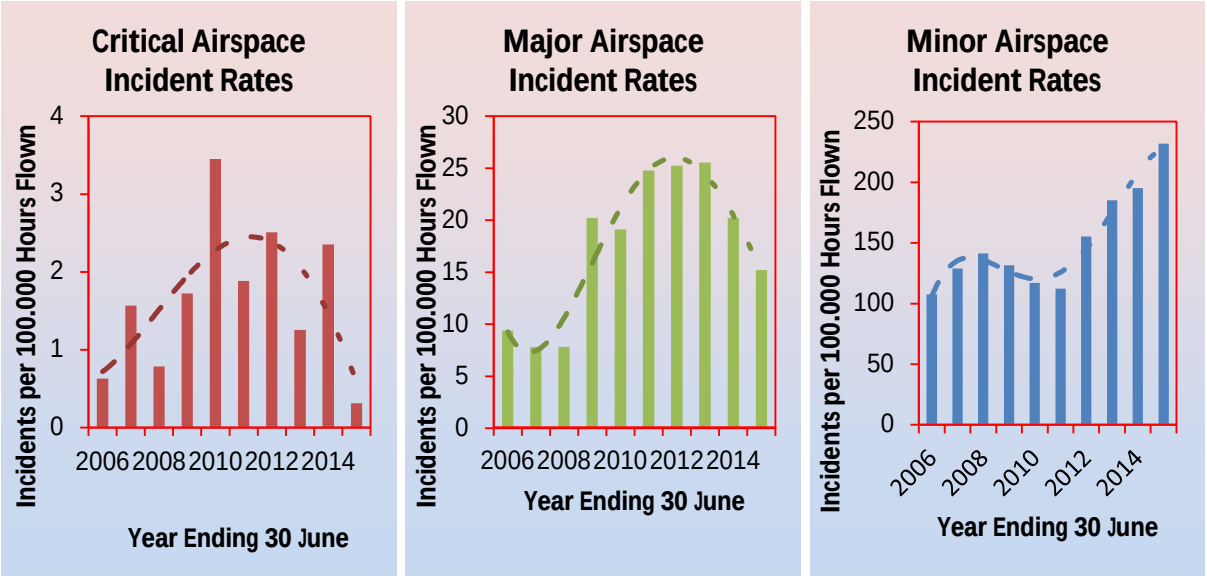
The following graphs show the reported annual airspace incident rates (incidents per 100,000 hours flown) for the ten one-year periods ending 30 June 2015 (excluding the Sport Aircraft category). The graphs do not differentiate between incidents that are pilot or ATS attributable.

Breakdown by Aircraft Category

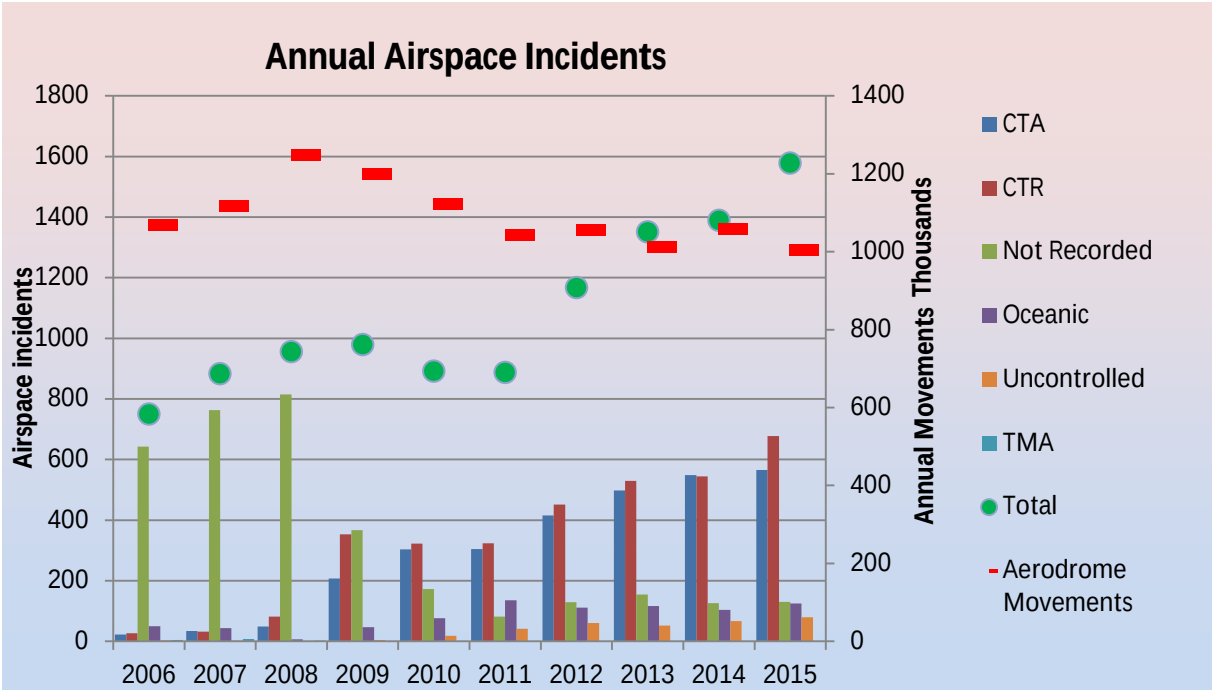




Breakdown by Severity



Breakdown by Airspace Designation



After June 2011 a sudden onset of a steady increase in the total numbers of reported airspace incidents is evident. This was in an environment of a steady but slower decrease in the reported number of aerodrome movements. No single underlying cause for this increase can be identified, although Airways Corporation began several safety enhancement training initiatives around this time.

Breakdown of Airspace Incidents in Control Zones by Aerodrome

Aerodrome	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Hamilton	4	5	10	14	47	60	120	162	94	162
Auckland	4	8	7	4	39	40	36	51	50	69
Tauranga	0	1	3	2	14	26	43	47	73	66
Queenstown	0	0	0	4	22	27	34	30	36	66
Christchurch	5	3	9	24	27	29	36	36	68	74
Palmerston North	1	1	12	13	21	22	25	34	48	51
Dunedin	0	0	0	1	15	9	20	34	29	42
Nelson	4	0	2	7	27	19	29	20	19	29
Wellington	0	3	7	13	32	31	46	28	34	28
Napier	2	2	5	0	8	5	10	17	12	16
Woodbourne	0	3	7	5	25	14	5	18	17	16
Whenuapai	1	0	0	2	6	4	7	12	9	12
Ohakea	0	0	2	3	8	4	10	11	13	13
Rotorua	1	1	6	3	13	19	20	7	14	10
Gisborne	0	1	1	1	4	5	1	13	9	8
New Plymouth	1	0	2	1	7	6	4	5	11	8
Invercargill	0	0	0	2	5	3	1	3	5	3

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 1556 of the 1578 reported airspace incidents in the year ending 30 June 2015. 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.

Descriptor Categories

Airspace incident descriptors can be broadly grouped into those that are solely associated with Air Traffic Service provision, those that are associated with Pilot activity and those that may be associated with either.

The breakdown into these broad categories is shown in this table.

Descriptor is associated with	Number of times descriptor applied
ATS	289
Pilot	1285
Either	222

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

Descriptor	Number assigned in 2015
ATS Clearance/Instruction Deficiency	106
ATS Coordination Deficiency	140
ATS Flight Information Deficiency	16
ATS Flight Planning System Deficiency	27

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

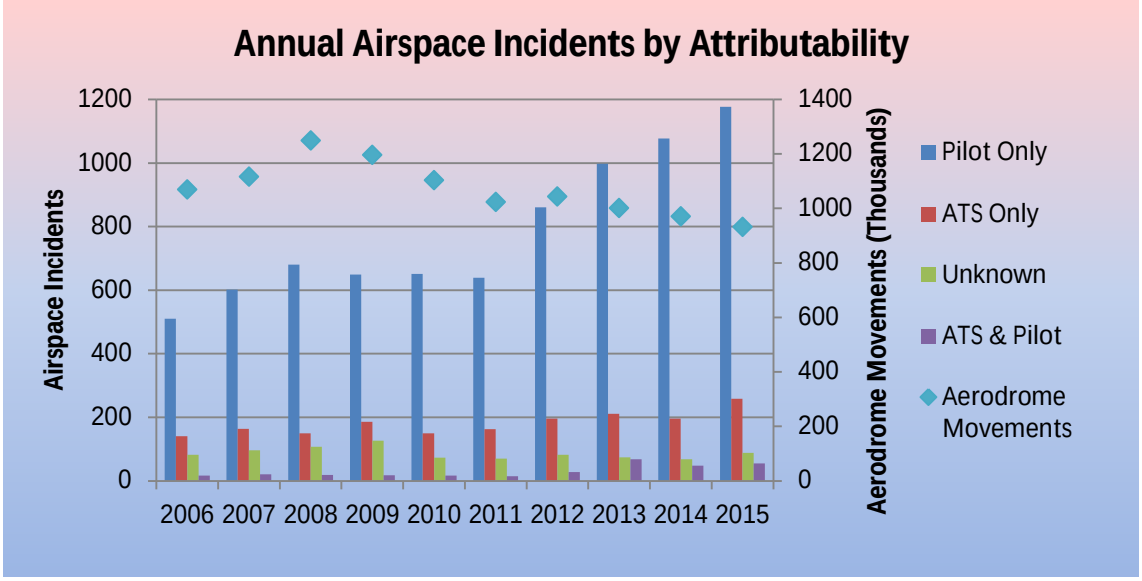
Descriptor	Number assigned in 2015
Air Proximity	72
Breach Of Other Clearance	525
Pilot Flight Planning Deficiency	20
Pilot Position Reporting Deficiency	110
Pilot Readback Deficiency	10
Unauth Airspace Incursion	375
Unauth Altitude Penetration	173

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

Descriptor	Number assigned in 2015
Controller/Pilot Datalink Communications	2
Loss Of Separation	38
Near Collision	10
Other	107
Reduced Vertical Separation Minima	0
Short Term Conflict Alert	9
Traffic Collision Avoidance System	56

Trend

The following graph shows the annual numbers of airspace incident reports and their attributability for the ten year period ending 30 June 2015.



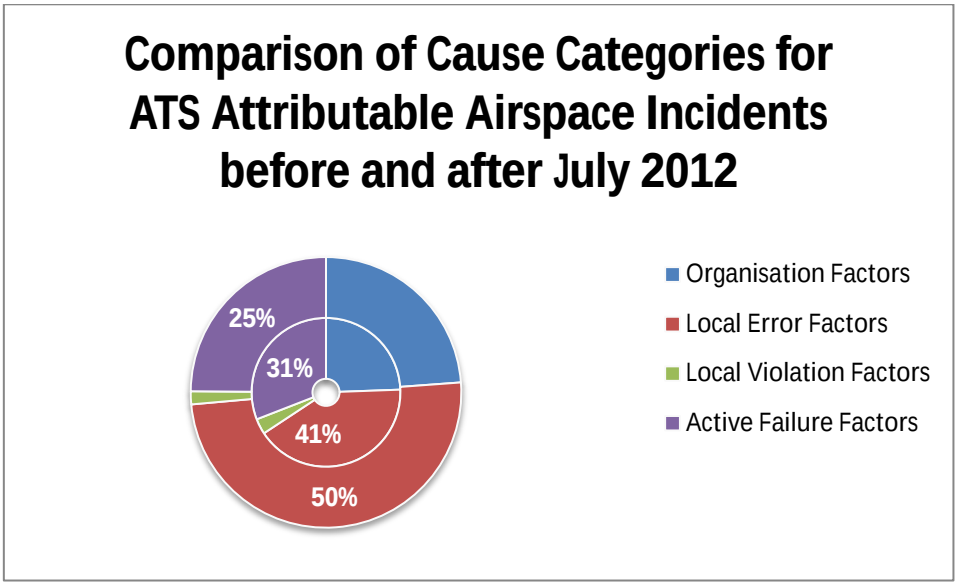
The number of "unknown" attributable airspace incidents reflects difficulties with coding of reports received by the CAA. Note that there is often a time delay between incidents occurring, being investigated, and attributability being assigned to either ATS or Pilot.

The ratio of Pilot Attributable to ATS Attributable incidents was relatively stable until the 2012 year that saw the total numbers begin a sharp upward trend. The data suggests that pilot attributable incidents are a disproportionate component of this trend.

ATS Attributable ASP Incidents

Causal Categories

The following chart shows the distribution of cause categories (groupings of causal factors) recorded for ATS-attributable airspace incidents that occurred during prior to and after June 2011. The inner ring represents the July 2006 to June 2011 period and the outer ring the period from July 2011 to June 2015



Local Error Factors

The increase in local error factors from 41% to 50 % while perhaps not major is the result of a major shift in causes after June 2011.

The top three causes were:

July 2006 to June 2011		July 2011 to June 2015	
INADEQUATE CHECKING	58%	INADEQUATE CHECKING	27%
TASK OVERLOAD	9%	OTHER ERROR ENFORCING CONDITION	22%
OTHER ERROR ENFORCING CONDITION	7%	RISK MISPERCEPTION	16%

Active Failure Factors

An increase in active failure factors offset most of the shift in local error factors.

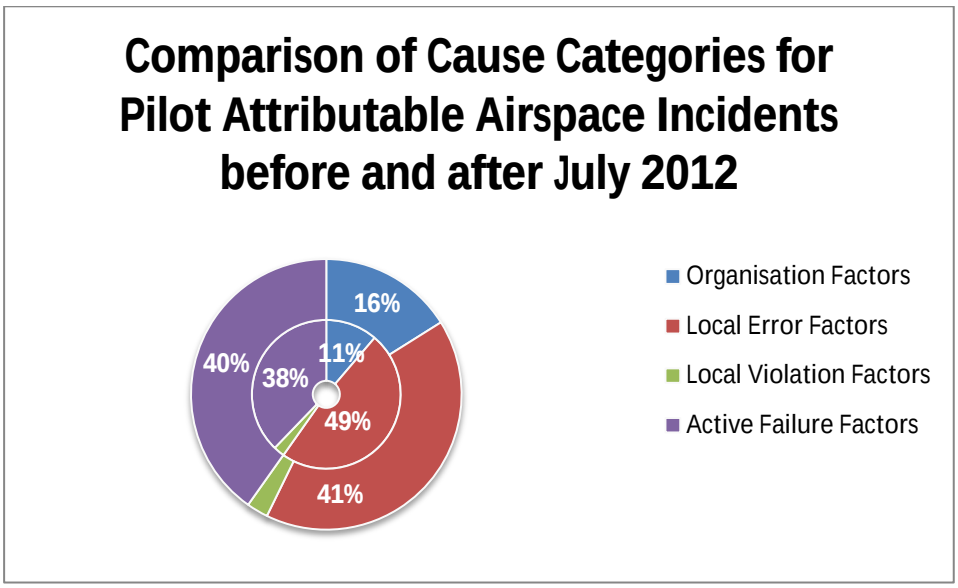
The top three contributing causes were:

July 2006 to June 2011		July 2011 to June 2015	
POOR PROCEDURE "ACTION"	30%	POOR PROCEDURE "ACTION"	13%
INACCURATE SYSTEM "DIAGNOSIS"	32%	INACCURATE SYSTEM "DIAGNOSIS"	21%
ACTIONS INCONSISTENT WITH PROCEDURES	17%	ACTIONS INCONSISTENT WITH PROCEDURES	27%

Pilot Attributable ASP Incidents

Causal Categories

The following chart shows the distribution of cause categories (groupings of causal factors) recorded for Pilot-attributable airspace incidents that occurred during prior to and after June 2011. The inner ring represents the July 2006 to June 2011 period and the outer ring the period from July 2011 to June 2015



Organisation Factors

Organisation factors increased from 11% to 16 % of all causal factors.

The top three causes were:

July 2006 to June 2011		July 2011 to June 2015	
INADEQUATE PROCEDURES	14%	INADEQUATE CONTROL AND MONITORING	28%
INADEQUATE COMMUNICATIONS	14%	INADEQUATE TRAINING	20%
INADEQUATE SPECIFICATIONS/REQUIREMENTS	14%	OTHER ORGANISATION FACTOR	16%

Local Error Factors

A reduction in the incidence of local error factors offset the increase in organisation factors.

The top three causes were:

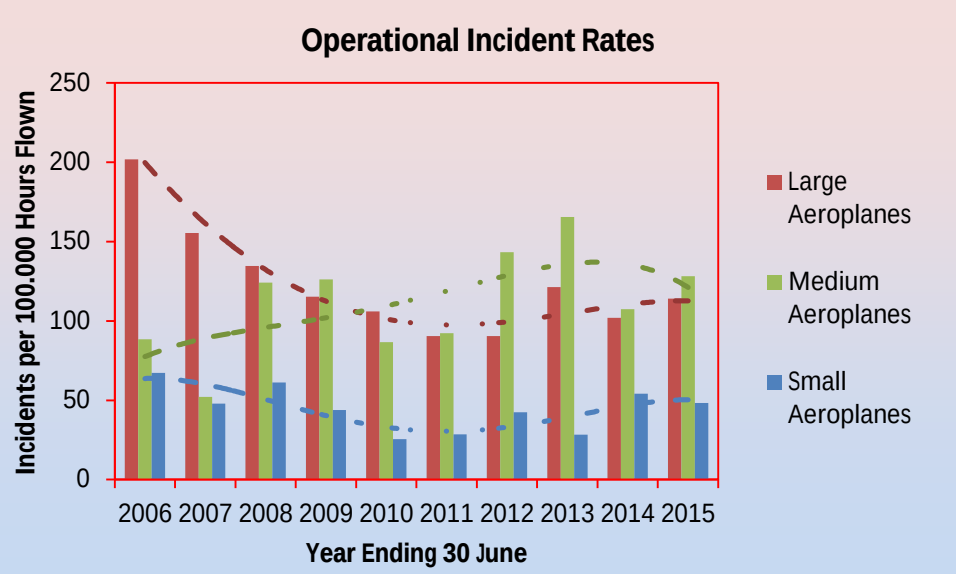
July 2006 to June 2011		July 2011 to June 2015	
INADEQUATE CHECKING	28%	INADEQUATE CHECKING	27%
POOR INSTRUCTIONS/PROCEDURES	12%	POOR INSTRUCTIONS/PROCEDURES	4%
TASK UNFAMILIARITY	7%	TASK UNFAMILIARITY	6%

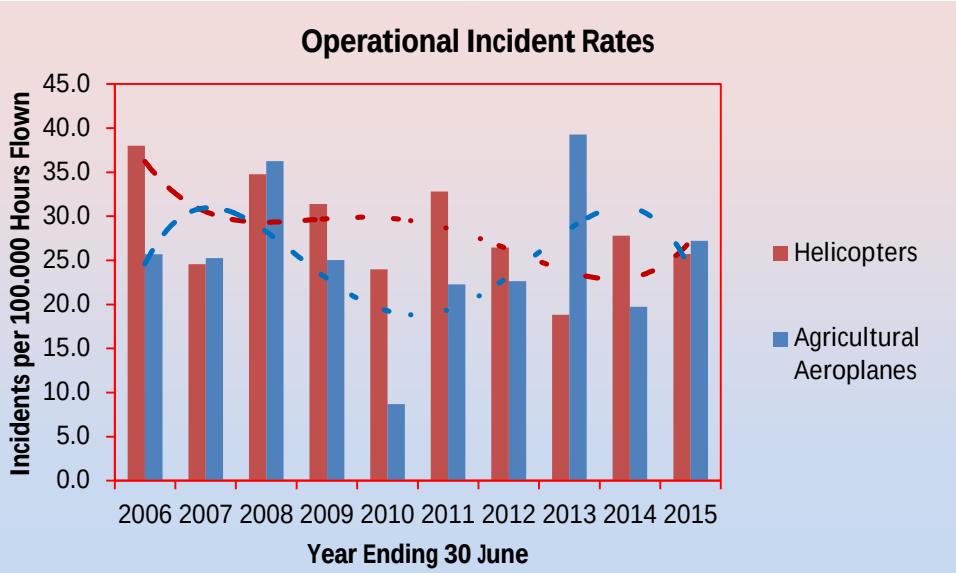
In early 2011 a system of follow-up letters was introduced by CAA for operators of aircraft who didn't report Airspace incidents that were reported by the ATS provider. Since the introduction of this system there has been a noticeable increase in the number of Airspace Incidents that are reported by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

Operational (Aircraft) Incidents

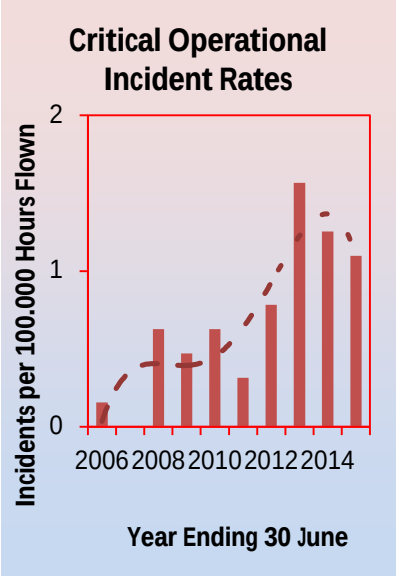
The following graphs show the reported annual operational incident rates (incidents per 100,000 hours flown) for the ten-year period ending 30 June 2015.

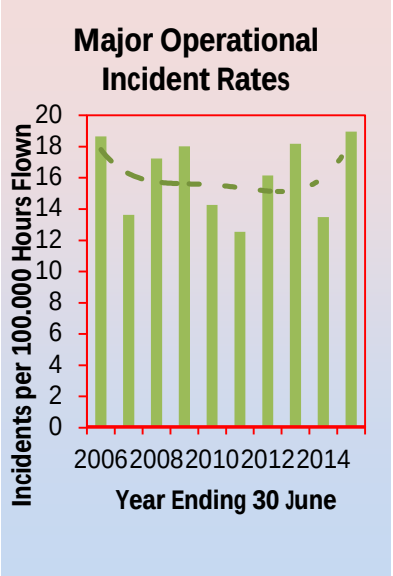
Breakdown by Aircraft Category

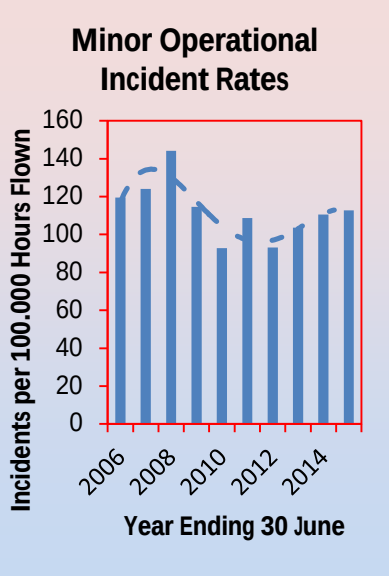




Breakdown by Severity







Number of Incidents

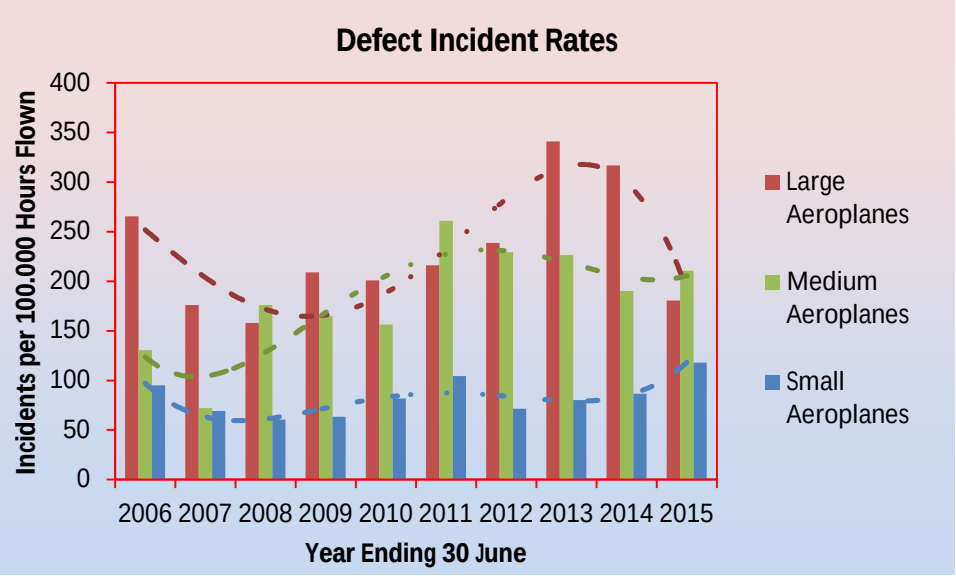
The following table shows, for each safety target group, the number of operational incidents each year for the last ten one year periods ending 30 June 2015. All aircraft types are included. The table is sorted by the number of incidents in the year ending June 2015.

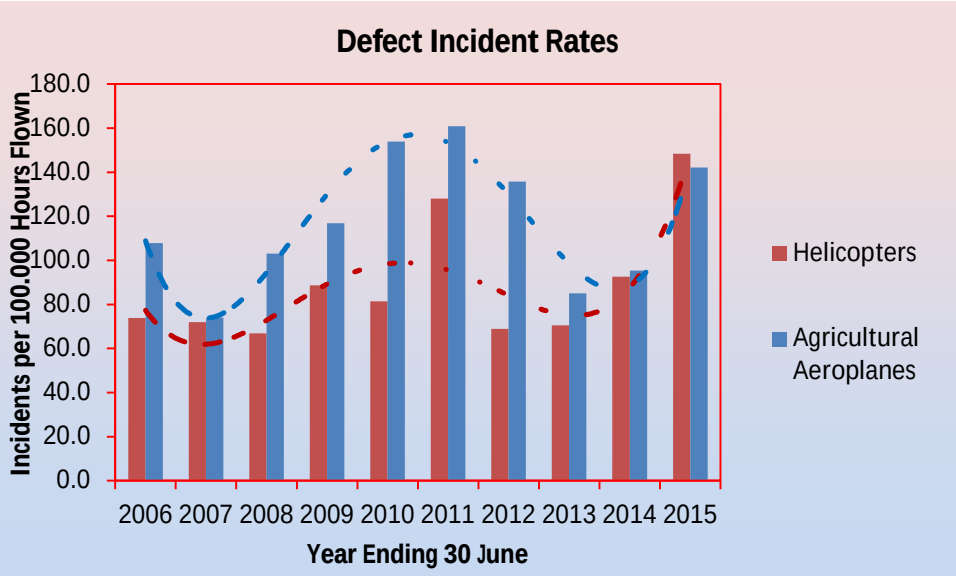
Safety Outcome Target Group	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Airline Operations - Large Aeroplanes	326	360	347	360	332	324	323	457	396	**449**
Other Commercial Operations - Aeroplane	44	60	124	94	53	58	78	58	87	**93**
Airline Operations - Medium Aeroplanes	47	31	79	71	46	43	74	74	57	**57**
Other	5	6	6	8	18	127	53	26	40	**55**
Private Operations - Sport	28	17	25	19	25	18	47	58	68	**52**
Other Commercial Operations - Helicopter	24	26	36	28	18	25	37	16	19	**39**
Sport Transport	4	2	7	3	2	5	16	31	46	**28**
Private Operations - Aeroplane	64	41	16	21	14	10	22	11	24	**19**
Airline Operations - Small Aeroplanes	20	11	33	13	8	11	11	2	9	**11**
Agricultural Operations - Aeroplane	6	14	20	8	3	9	9	12	4	**9**
Airline Operations - Helicopter	3	0	10	15	10	20	6	11	18	**5**
Agricultural Operations - Helicopter	7	7	13	12	11	11	5	8	9	**5**
None	293	298	317	195	143	107	13	15	14	**5**
Private Operations - Helicopter	11	5	1	2	3	7	7	4	3	**2**
Total	**882**	**878**	**1034**	**849**	**686**	**775**	**701**	**783**	**794**	**829**

Defect Incidents

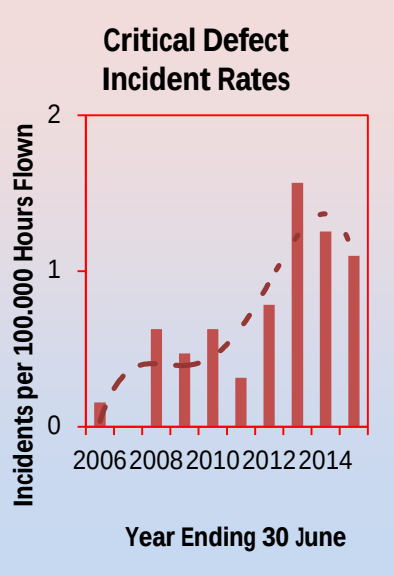
The following graphs show the aircraft defect incident reporting rates (incidents reported per 100,000 hours flown) for the ten-year period ending 30 June 2015.

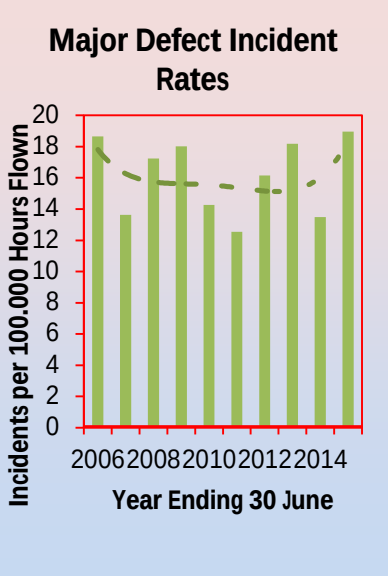
Breakdown by Aircraft Category

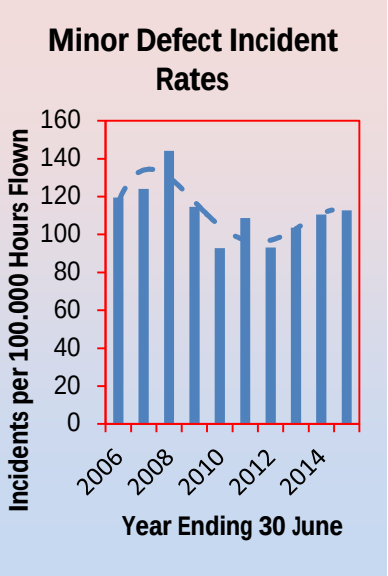




Breakdown by Severity







Number of Incidents

The following table shows, for each safety target group, the number of defect incidents each year for the last ten one year periods ending 30 June 2015. All aircraft types are included. The table is sorted by the number of incidents in the year ending June 2015.

Safety Outcome Target Group	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Airline Operations - Large Aeroplanes	473	464	423	590	620	700	794	1155	1090	**628**
Other Commercial Operations - Helicopter	53	66	63	65	46	109	82	55	94	**281**
Other Commercial Operations - Aeroplane	70	104	94	219	143	185	133	146	154	**261**
Airline Operations - Medium Aeroplanes	50	50	100	74	66	117	111	97	77	**70**
Agricultural Operations - Aeroplane	37	43	51	36	44	65	47	29	29	**53**
Private Operations - Aeroplane	69	35	31	26	65	33	33	30	35	**44**
Other	3	15	8	10	17	35	15	23	48	**26**
Airline Operations - Small Aeroplanes	30	45	49	49	48	80	33	41	26	**25**
Private Operations - Sport	9	9	9	11	30	27	38	19	17	**16**
None	199	119	129	46	69	24	14	12	10	**9**
Agricultural Operations - Helicopter	9	9	6	8	13	29	19	27	25	**6**
Private Operations - Helicopter	21	8	3	15	17	26	12	12	17	**6**
Airline Operations - Helicopter	6	20	28	61	60	78	26	54	27	**5**
Sport Transport	1	0	1	0	1	8	5	11	4	**1**
Total	**1030**	**987**	**995**	**1210**	**1239**	**1516**	**1362**	**1711**	**1653**	**1431**

ATA Chapters

Defect Incidents reported as occurring during the year ending 30 June 2015 were associated with the following ATA component code chapters.

Large Aeroplanes

The most common chapter was Chapter 27 (AEROPLANE FLIGHT CONTROL - GENERAL) with 186 defects. The next most common chapter was Chapter 21 (AIR CONDITIONING - GENERAL) with 41 defects

Medium Aeroplanes

The most common chapter was Chapter 34 (FLIGHT NAVIGATION SYSTEMS - GENERAL) with 18 defects. The next most common chapter was Chapter 32 (LANDING GEAR (LG) - GENERAL) with 14 defects

Small Aeroplanes

The most common chapter was Chapter 73 (POWERPLANT FUEL SYSTEM - GENERAL) with 77 defects. The next most common chapter was Chapter 32 (LANDING GEAR (LG) - GENERAL) with 35 defects

Agricultural Aeroplanes

The most common chapter was Chapter 73 (POWERPLANT FUEL SYSTEM - GENERAL) with 10 defects. The next most common chapter was Chapter 32 (LANDING GEAR (LG) - GENERAL) with 10 defects

Helicopters

The most common chapter was Chapter 73 (POWERPLANT FUEL SYSTEM - GENERAL) with 141 defects. The next most common chapter was Chapter 28 (FUEL SYSTEM - GENERAL) with 39 defects

Sport Aircraft

The most common chapter was Chapter 23 (COMMUNICATION SYSTEMS - GENERAL) with 5 defects. The next most common chapters were Chapter 73 (POWERPLANT FUEL SYSTEM - GENERAL) and Chapter 27 (AEROPLANE FLIGHT CONTROL - GENERAL) with 4 defects each.

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.

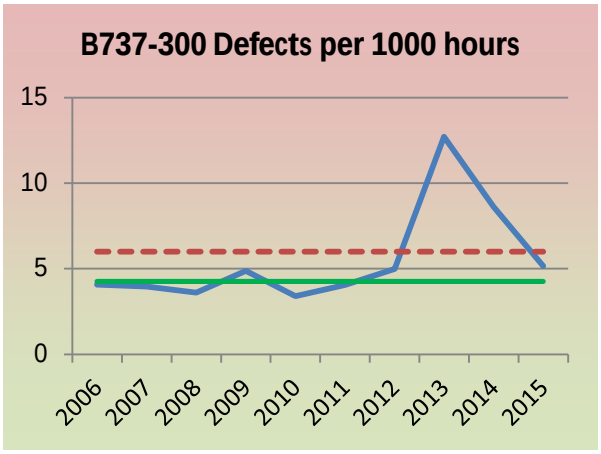
Defect Rate	CAA Action
Normal	Monitor
Alert	Notify appropriate General Manager
High	Notify appropriate General Manager

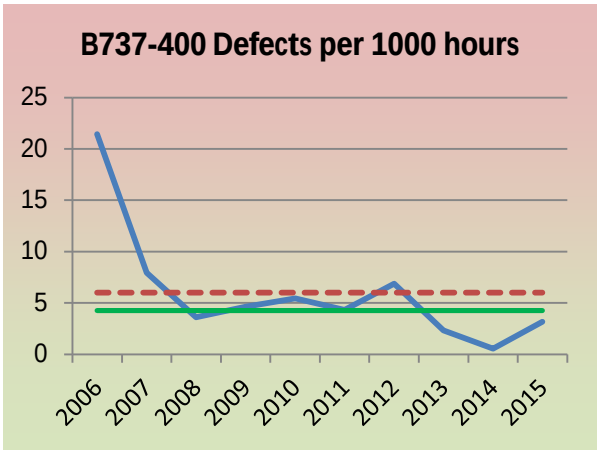
The timing of defect reports is often considerably later than what is mandated by Rule Part 12 and likewise a small number of operators of large and medium aeroplanes are persistently late with their hours and flights data returns. As a result the last two quarters of following defect rate graphs are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

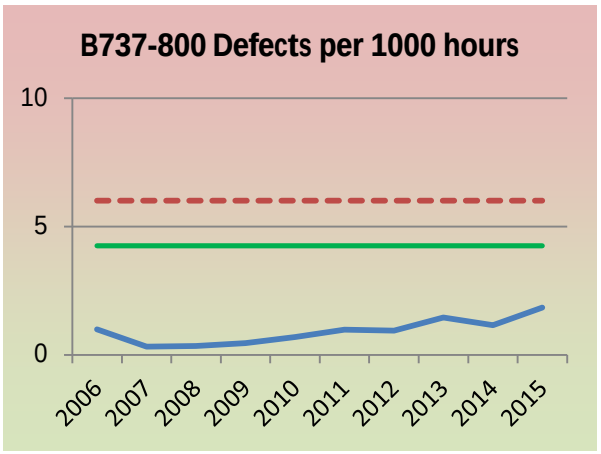
Analysis

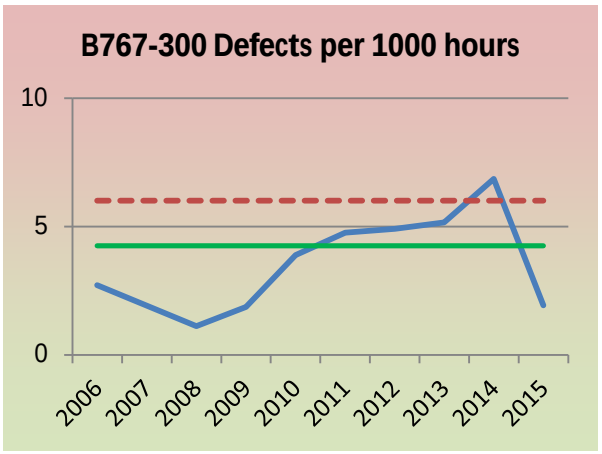
The red line on each graph shows the High defect rate. The green line shows the Alert defect rate. The Manager Airline Maintenance is notified of all high and alert rates on a quarterly basis.

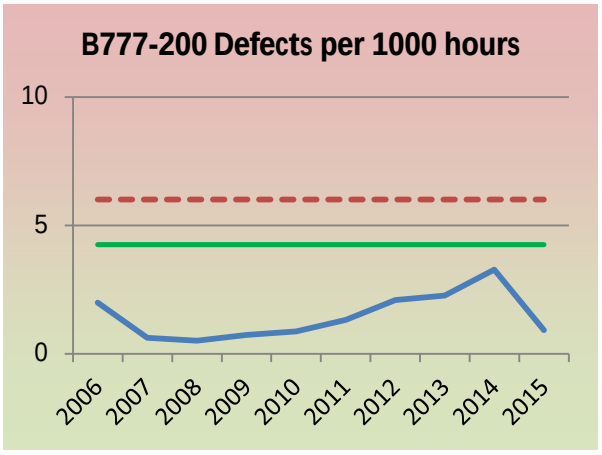
Large Aeroplanes

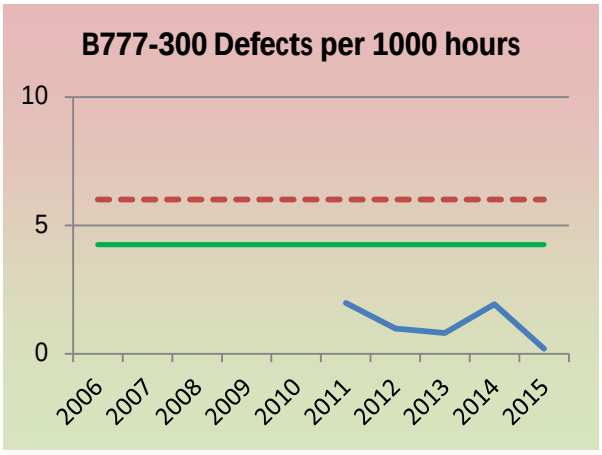


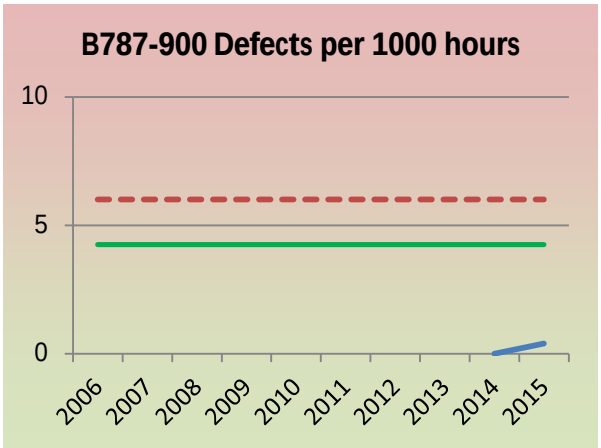


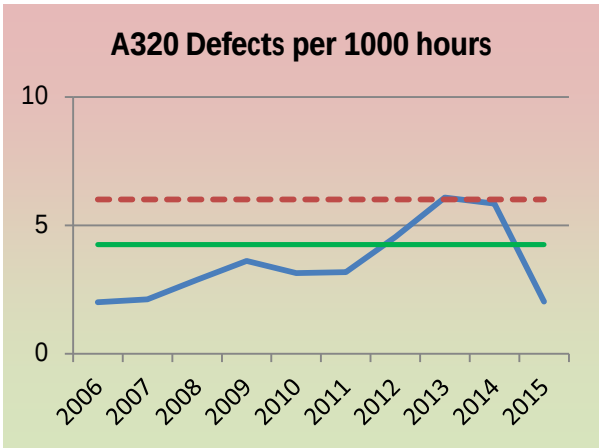


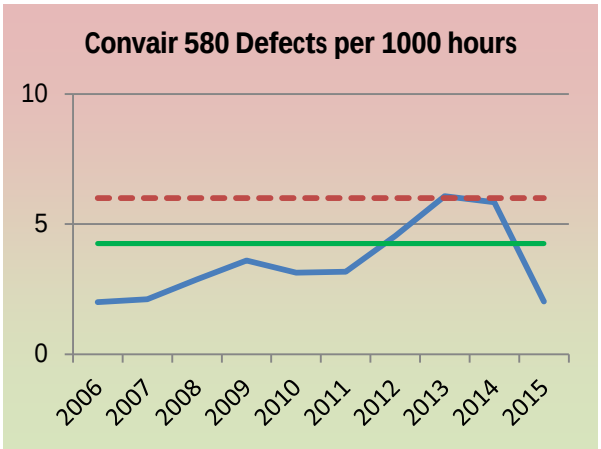


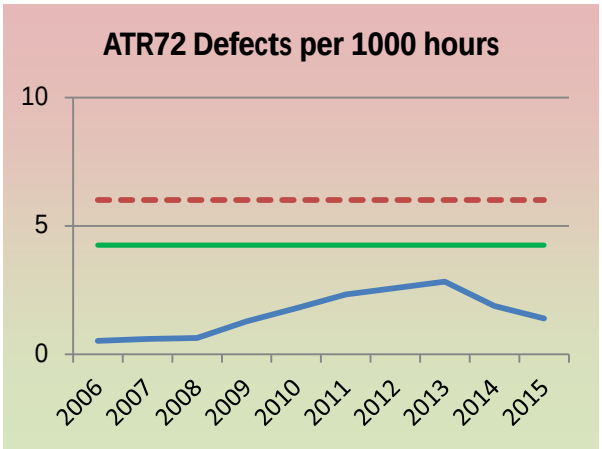


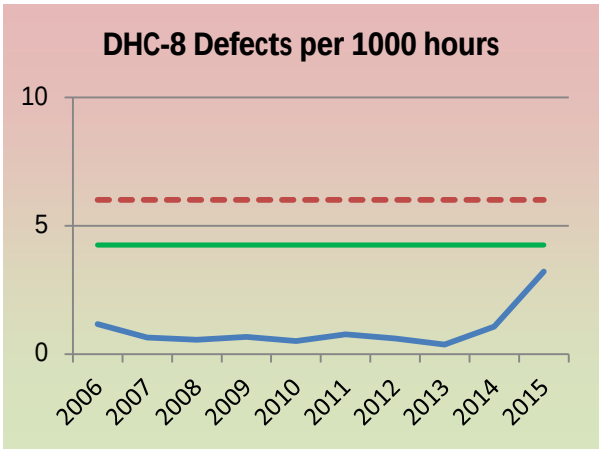



B787-900 Defects per 1000 hours
10
5
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015

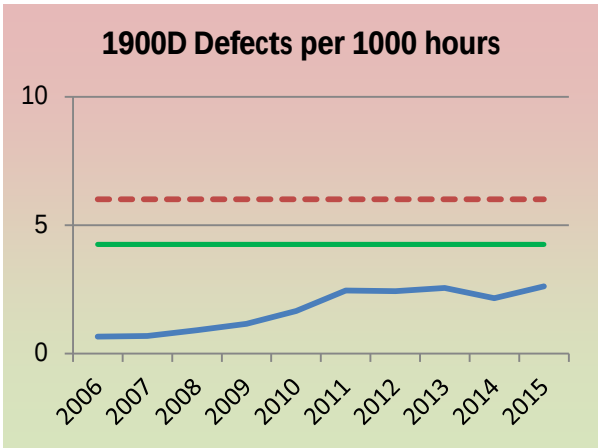

A320 Defects per 1000 hours
10
5
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015

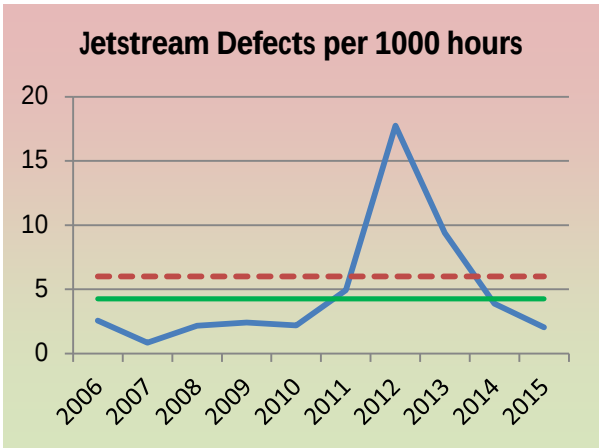

Convair 580 Defects per 1000 hours
10
5
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015

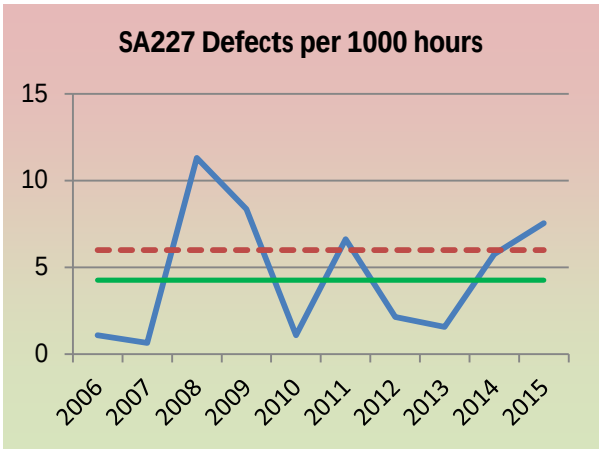

ATR72 Defects per 1000 hours
10
5
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015


DHC-8 Defects per 1000 hours
10
5
0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015

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 30 March 2015.

	Quarter											
Aerodrome	**12/3**	**12/4**	**13/1**	**13/2**	**13/3**	**13/4**	**14/1**	**14/2**	**14/3**	**14/4**	**15/1**	**15/2**
Auckland	3.0	2.4	2.7	3.5	3.6	3.7	2.9	2.1	2.3	2.2	2.5	3.5
Chatham Islands	0.0	0.0	0.0	0.0	10.0	10.0	10.0	20.0	20.0	30.0	30.0	20.0
Christchurch	4.1	3.7	3.7	3.4	2.9	3.2	3.7	3.4	3.3	3.2	2.9	3.5
Dunedin	4.4	5.1	4.1	6.0	7.5	6.2	8.1	6.3	5.3	4.8	4.0	5.8
Gisborne	7.4	7.1	7.5	7.2	7.7	6.8	5.8	7.0	9.1	11.3	10.5	8.9
Hamilton	1.2	1.4	1.4	1.2	1.0	1.3	1.3	1.7	1.6	1.1	1.3	1.5
Hokitika	3.6	3.6	0.0	0.0	3.6	3.5	3.0	2.7	0.0	0.0	0.0	0.0
Invercargill	1.9	2.5	3.8	3.6	3.4	2.2	2.3	6.5	9.9	12.0	12.3	10.1
Kerikeri	8.8	10.0	10.0	13.8	10.0	8.8	10.0	8.8	10.0	10.0	7.5	5.0
Manapouri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.5	27.5
Napier	12.3	9.1	12.2	11.7	9.0	9.4	6.2	7.1	8.1	10.6	11.9	11.2
Nelson	3.0	3.1	4.8	5.6	4.3	3.9	3.5	2.9	3.9	4.1	5.0	6.6
New Plymouth	3.6	4.2	5.3	6.8	6.9	6.4	3.8	1.7	3.0	4.6	7.0	7.1
Ohakea	2.5	2.6	3.7	2.2	4.0	3.8	3.9	6.1	5.3	5.8	5.6	3.9
Palmerston North	3.8	4.5	4.5	5.1	5.2	5.7	6.8	4.7	4.6	3.8	3.6	4.7
Paraparaumu	0.9	1.8	1.4	2.5	3.0	2.6	2.7	2.5	2.1	1.6	1.6	1.9
Queenstown	4.8	5.5	5.4	4.0	3.3	2.3	2.3	2.3	2.5	3.1	2.9	2.7
Rotorua	2.3	2.3	4.4	6.3	6.6	6.2	6.1	4.7	5.9	6.0	4.5	4.6
Taupo	2.3	2.7	1.2	1.7	2.1	1.3	1.3	1.7	0.9	0.9	0.9	0.5
Tauranga	2.2	2.5	2.3	2.0	2.3	2.8	3.1	3.4	3.2	2.7	3.0	2.5
Timaru	2.5	3.8	3.8	5.0	6.3	6.3	6.3	3.8	3.8	2.5	1.3	1.3
Wanganui	2.6	3.6	3.2	6.7	7.4	5.6	5.5	3.4	3.2	2.8	5.2	3.7
Wellington	3.7	3.3	3.3	3.1	2.8	2.7	2.9	2.4	2.2	3.4	3.7	4.9
Westport	14.5	14.5	4.8	4.8	4.8	4.8	4.8	9.7	4.8	9.7	14.5	14.5
Whakatane	2.5	2.5	4.2	3.3	5.0	5.0	4.2	5.8	3.3	4.2	3.3	3.3
Whangarei	5.3	4.5	2.3	3.8	6.8	7.5	7.5	6.0	2.3	2.3	2.3	1.5
Whenuapai	14.2	12.1	7.1	6.6	5.2	5.2	8.8	8.2	8.4	11.4	8.5	10.2
Woodbourne	4.4	5.3	7.2	10.4	9.5	8.7	7.4	4.7	5.2	5.9	7.3	7.0
Overall	**3.6**	**3.6**	**3.8**	**4.1**	**4.0**	**3.9**	**3.7**	**3.3**	**3.2**	**3.3**	**3.6**	**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

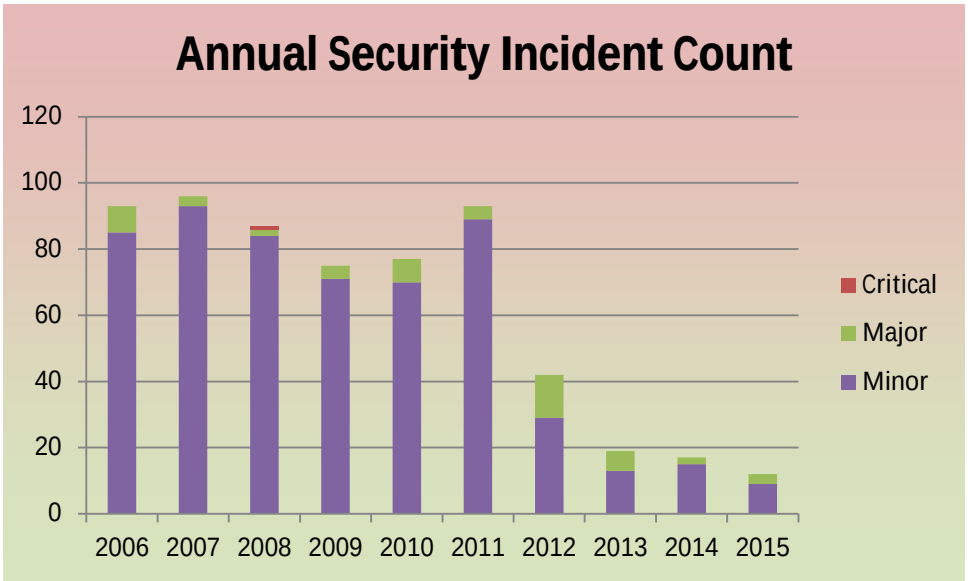
Details as at 30 June 2015 for individual aerodromes are shown in the following table.

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

Security Incidents

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

The following chart shows the annual numbers of reported security incidents over the ten year period ending 30 June 2015



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.

Breakdown by Nearest Aerodrome

The following table shows a breakdown by location (nearest staffed aerodrome) of the above security incidents

Aerodrome	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Auckland	11	18	8	20	25	51	13	5	2	3
Auckland	0	1	0	0	0	0	0	0	0	0
Christchurch	15	11	2	10	4	15	1	1	1	1
Dunedin	1	2	0	1	2	0	0	0	0	0
Gisborne	3	2	0	0	2	0	0	3	0	0
Hamilton	3	0	0	2	1	0	3	0	1	0
Milford Sound	2	2	5	1	0	0	0	0	0	0
New Plymouth	1	0	0	0	0	0	0	0	0	0
Napier	0	1	0	0	1	0	0	0	0	0
nelson	1	1	1	1	2	2	0	1	0	2
Invercargill	1	1	0	1	0	0	0	0	0	0
Palmerston North	2	1	0	0	0	0	0	0	0	0
Paraparaumu	0	0	0	0	2	0	1	0	1	1
Queenstown	2	0	1	1	3	2	1	0	0	0
Rotorua	1	3	0	2	0	0	0	0	0	0
Tauranga	1	2	2	0	0	0	0	0	0	0
Woodbourne	0	2	0	0	0	1	0	0	0	0
Wellington	5	9	0	6	6	7	10	2	2	2
Not Reported	38	36	65	26	26	15	11	5	9	3

Breakdown by Aircraft Category

The following table shows a breakdown by Aircraft Statistics Category of the above security incidents.

Aircraft Category	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Large Aeroplanes	27	30	17	20	10	3	14	6	8	2
Medium Aeroplanes	2	1	3	6	0	2	1	4	0	1
Small Aeroplanes	0	0	0	0	0	0	1	1	0	0
Helicopters	0	0	0	0	0	0	0	0	0	0
Agricultural Aeroplanes	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	9
Total	29	31	20	26	10	5	16	11	8	12

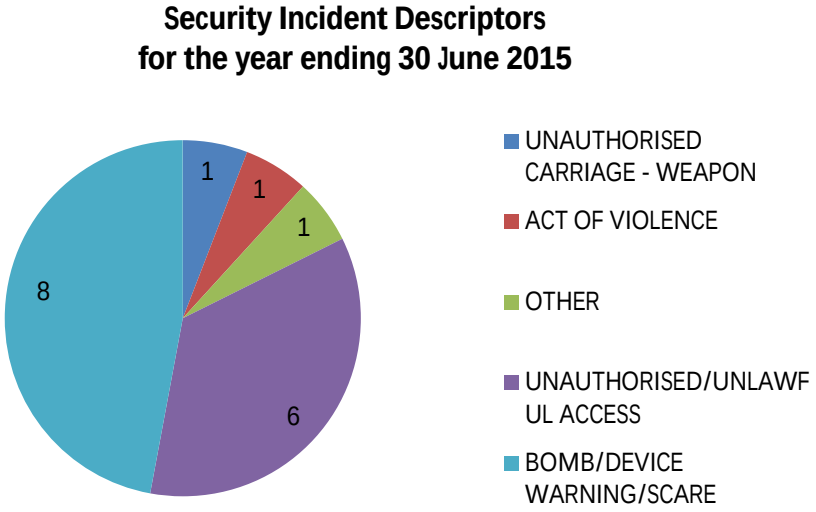
Descriptors and Causal Factors

The most common descriptor (8) recorded for Security Incidents during the Year Ending 30 June 2015 was 'BOMB/DEVICE WARNING/SCARE'

No causal factors have been recorded for security incidents that occurred during the Year Ending 30 June 2015.

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 30 June 2015.



Aerodrome Incidents

Runway Incursions

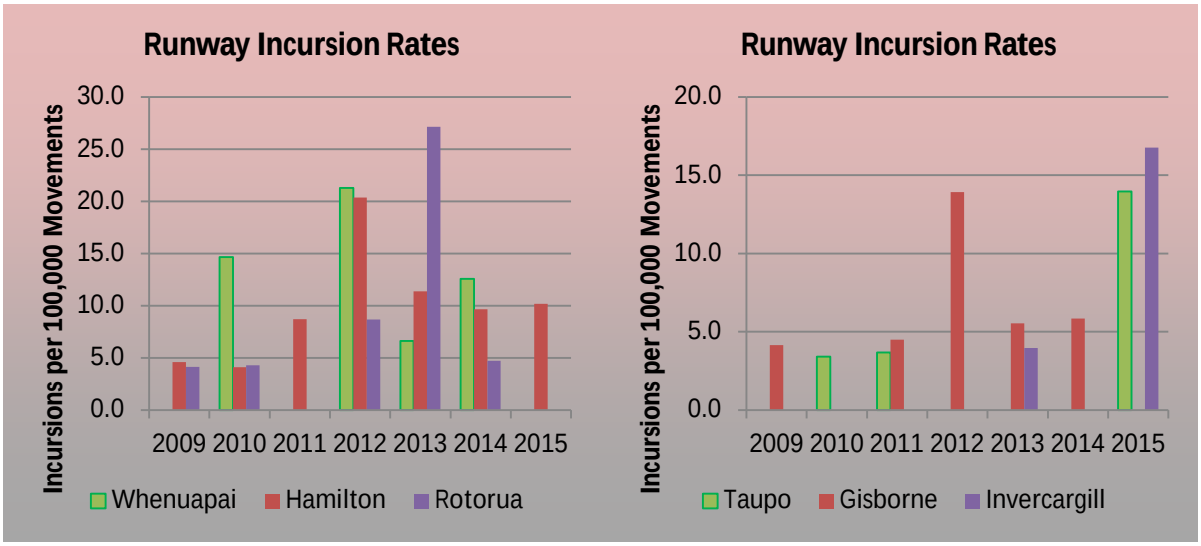
Runway incursion rates are calculated by dividing the total number of reported Aerodrome Incidents that have any of the five runway incursion descriptors by the total number of reported movements for the same aerodrome over the same period. The result is tabulated and graphed as runway incursions per 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 annual values of reported runway incursion rates for all certificated aerodromes for which adequate movement data is available.

Aerodrome	2009	2010	2011	2012	2013	2014	2015
Invercargill	0.0	0.0	0.0	0.0	4.0	0.0	16.8
Taupo	0.0	3.4	3.7	0.0	0.0	0.0	14.0
Ohakea	0.0	1.5	3.5	0.0	7.3	8.3	10.6
Hamilton	4.6	4.1	8.7	20.4	11.4	9.7	10.2
Queenstown	0.0	0.0	2.4	2.3	9.5	2.3	8.3
Tauranga	3.0	2.1	2.6	5.5	9.6	12.3	7.6
Woodbourne	8.2	8.7	0.0	4.3	0.0	4.7	4.7
Palmerston North	5.9	1.8	0.0	2.9	1.6	3.7	3.7
Wellington	5.2	3.6	0.9	4.7	2.0	4.1	3.1
Christchurch	2.8	6.2	1.6	3.4	1.8	4.5	2.8
Auckland	3.8	4.5	1.9	1.9	2.6	4.5	2.6
Rotorua	4.1	4.3	0.0	8.7	27.1	4.7	0.0
Whenuapai	0.0	14.7	0.0	21.3	6.6	12.6	0.0
Gisborne	4.2	0.0	4.5	13.9	5.5	5.8	0.0
Napier	0.0	0.0	10.8	11.7	4.2	0.0	0.0
Dunedin	1.6	4.3	0.0	10.6	4.3	4.2	0.0
Nelson	4.1	8.0	4.0	4.0	8.6	2.2	0.0
New Plymouth	0.0	0.0	0.0	6.3	0.0	4.3	0.0

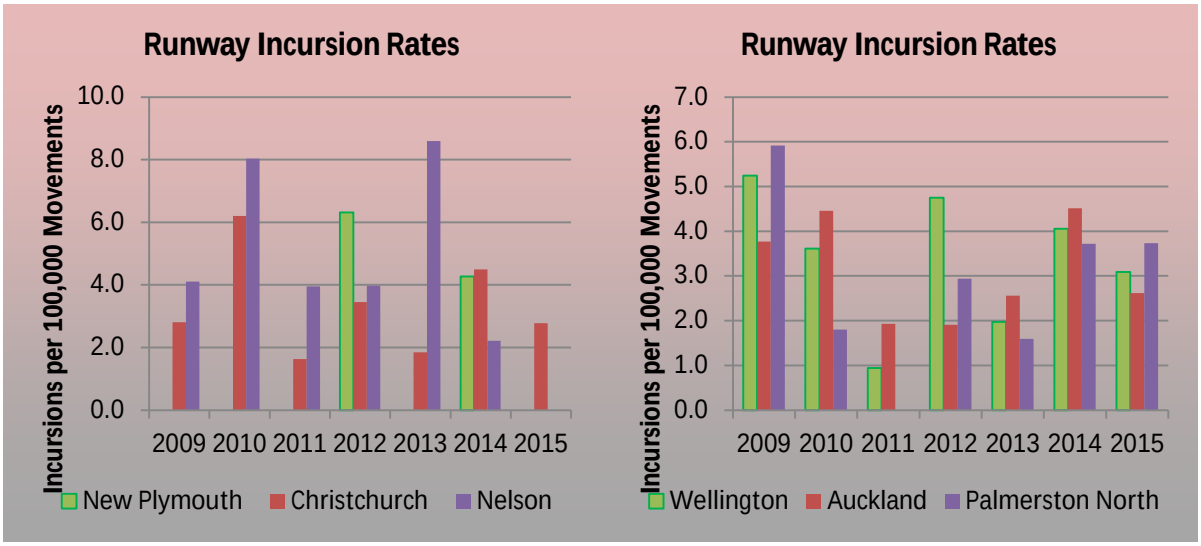
The charts on the next page show the above data in a graphical way. Aerodromes have been grouped in an arbitrary way to keep the number of lines on each chart roughly equal. The grouping is based on the largest value reported over the period covered.


Runway Incursion Rates
Incursions per 100,000 Movements
30.0
25.0
20.0
15.0
10.0
5.0
0.0
2009 2010 2011 2012 2013 2014 2015
Whenuapai
Hamilton
Rotorua

Runway Incursion Rates
Incursions per 100,000 Movements
20.0
15.0
10.0
5.0
0.0
2009 2010 2011 2012 2013 2014 2015
Taupo
Gisborne
Invercargill


Runway Incursion Rates
Incursions per 100,000 Movements
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2009 2010 2011 2012 2013 2014 2015
Napier
Dunedin
Tauranga

Runway Incursion Rates
Incursions per 100,000 Movements
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2009 2010 2011 2012 2013 2014 2015
Queenstown
Woodbourne
Ohakea


Runway Incursion Rates
Incursions per 100,000 Movements
10.0
8.0
6.0
4.0
2.0
0.0
2009 2010 2011 2012 2013 2014 2015
New Plymouth
Christchurch
Nelson

Runway Incursion Rates
Incursions per 100,000 Movements
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
2009 2010 2011 2012 2013 2014 2015
Wellington
Auckland
Palmerston North

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
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	22	77	134	104	133	7	3	79	5	0	3	2
Oct-2014	6	24	66	137	97	96	3	4	77	2	0	1	0
Nov-2014	6	17	74	99	102	128	4	3	69	1	1	1	1
Dec-2014	6	14	71	111	97	98	9	1	48	1	0	2	1
Jan-2015	11	17	91	108	96	75	2	2	40	1	0	0	1
Feb-2015	8	20	72	178	59	125	4	2	63	1	1	7	0
Mar-2015	9	18	91	164	186	110	3	2	67	3	2	1	2
Apr-2015	4	10	56	145	141	99	1	2	134	3	0	1	0
May-2015	4	11	78	133	167	133	1	3	62	5	0	2	0
Jun-2015	6	15	61	123	114	127	0	2	60	9	1	0	3

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 a summary of occurrence causes recorded during the year ending 30 June 2015 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 30 June2015 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			2		2
	INACCURATE SYSTEM "DIAGNOSIS"	1				1
	POOR PROCEDURE "ACTION"		1			1
	PRIMARILY "STRUCTURAL/MECHANICAL"		1		8	2
Organisation	DESIGN DEFICIENCIES					1
	INADEQUATE COMMUNICATIONS	1		1		
	INADEQUATE CONTROL AND MONITORING	1			1	
	INADEQUATE DEFENCES					1
	INADEQUATE PROCEDURES				1	
	INADEQUATE RESOURCE MANAGEMENT					1
	INADEQUATE TRAINING				1	3
	OTHER ORGANISATION FACTOR		1			1
	UNSUITABLE EQUIPMENT					1
Task/Environment Error	FATIGUE - OTHER					1
	HOSTILE ENVIRONMENT			1		2
	LACK OF KNOWLEDGE	1				
	POOR SYSTEM FEEDBACK					2

Medium Aeroplanes

Category	Cause	ACC	ASP	DEF
Active Failure	INAPPROPRIATE "STRATEGY"	1		
	POOR PROCEDURE "ACTION"		2	
Organisation	INADEQUATE CONTROL AND MONITORING	1		1
Task/Environment Error	HOSTILE ENVIRONMENT	2	2	
	POOR SIGNAL:NOISE		1	
Task/Environment Violation	GROUP VIOLATION CONDONING ATTITUDE	1		

Unknown Aircraft Category

Category	Cause	ADI	ARC	ASP	DEF	DGD	INC
Active Failure	ACTIONS INCONSISTENT WITH PROCEDURES			1			
	INACCURATE SYSTEM "DIAGNOSIS"			3			
	INAPPROPRIATE "STRATEGY"					1	
	PRIMARILY "STRUCTURAL/MECHANICAL"			1	2		2
Organisation	OTHER ORGANISATION FACTOR						2
	POOR DECISIONS		1				
Task/Environment Error	HOSTILE ENVIRONMENT			1			1
	LACK OF KNOWLEDGE			1			
	OTHER ERROR ENFORCING CONDITION	1		1			
	POOR ATTENTION SPAN			1			
	POOR SYSTEM FEEDBACK			1			
	TASK UNFAMILIARITY			1			

Other Aeroplanes, Helicopters and Sport Aircraft

Category	Cause	ACC	ARC	ASP	DEF	INC
Active Failure	ACTIONS INCONSISTENT WITH PROCEDURES					1
	INAPPROPRIATE "GOAL"			2		
	INAPPROPRIATE "PROCEDURES"			2		
	INAPPROPRIATE "STRATEGY"			2		
	POOR PROCEDURE "ACTION"	2		2		1
	PRIMARILY "STRUCTURAL/MECHANICAL"	4			2	
	STATE CHANGE NOT DETECTED "INFORMATION"			1		
Organisation	DESIGN DEFICIENCIES					1
	INADEQUATE PROCEDURES		1			1
	INAPPROPRIATE GOALS OR POLICIES					1
Task/Environment Error	INADEQUATE CHECKING	1				
	POOR HUMAN-SYSTEM INTERFACE	1				
	RISK MISPERCEPTION					1
	TASK OVERLOAD					1
	TASK UNFAMILIARITY					1
Task/Environment Violation	PERCEIVED LICENSE TO BEND RULES	1				

Aircraft Maintenance Operations

The following section summarises causal factors identified from investigation of occurrences that occurred during the year ended 30 June2015 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"	2	2
Organisation	DESIGN DEFICIENCIES	2	
	INADEQUATE DEFENCES	1	
Task/Environment Error	LACK OF KNOWLEDGE	1	
	TASK OVERLOAD	1	
Task/Environment Violation	POOR SUPERVISION & CHECKING	1	

Medium Aeroplanes

Category	Cause	DEF
Active Failure	PRIMARILY "STRUCTURAL/MECHANICAL"	1

Other Aeroplanes, Helicopters and Sport Aircraft

Category	Cause	ACC	DEF	INC
Active Failure	ACTIONS INCONSISTENT WITH PROCEDURES		1	
	POOR PROCEDURE "ACTION"		1	1
	PRIMARILY "STRUCTURAL/MECHANICAL"		7	
	STATE CHANGE NOT DETECTED "INFORMATION"		1	
Organisation	DESIGN DEFICIENCIES	1	3	
	INADEQUATE COMMUNICATIONS	1		
	INADEQUATE CONTROL AND MONITORING	1		1
	INADEQUATE SPECIFICATIONS/REQUIREMENTS	1	1	
	INADEQUATE TRAINING	1		
Task/Environment Error	LACK OF KNOWLEDGE	1		
	POOR INSTRUCTIONS/PROCEDURES		1	
	TASK UNFAMILIARITY	1		

Unknown Aircraft Category

No instances

Air Traffic Services and Personnel

The following tables summarise causal factors identified from investigation of occurrences that occurred during the year ended 30 June 2015 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	ARC	ASP	PIO
Organisation	INADEQUATE DEFENCES	1		2	
	OTHER ORGANISATION FACTOR		1	3	
Task/Environment Error	INADEQUATE CHECKING			1	
	INTERPRETATION DIFFICULTIES			1	
	OTHER ERROR ENFORCING CONDITION			1	
	PHYSIOLOGICAL OTHER			4	
	PSYCHOLOGICAL OTHER			1	1
	RISK MISPERCEPTION			1	

Air Traffic Service Personnel

Category	Cause	ADI	ASP	PIO
Active Failure	ACTIONS INCONSISTENT WITH PROCEDURES			1
	INAPPROPRIATE "PROCEDURES"	1	2	
	POOR PROCEDURE "ACTION"		2	
Task/Environment Error	DESIGNER USER MISMATCH		2	
	INADEQUATE CHECKING	1	1	
	OTHER ERROR ENFORCING CONDITION	1		
	PHYSIOLOGICAL OTHER		1	
	POOR SIGNAL:NOISE		1	
	PSYCHOLOGICAL OTHER	1		
	RISK MISPERCEPTION		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 30 June 2015 and over the Preceding Four Years)

	As at 30 June 2015				Average at end of each of 4 prior 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	4	0.0	0.0	0.3	2.8
Part 109 Regulated Air Cargo Agent	0	1	12	44	0.5	1.3	7.0	51.0
Part 115 Adventure Aviation Operator Certificate	0	2	9	23	2.0	0.5	1.8	6.0
Part 121 Air Operator Large Aeroplanes	0	0	0	3	0.0	0.0	0.0	3.0
Part 125 Air Operator Medium Aeroplanes	0	0	0	4	0.3	0.5	0.5	4.3
Part 129 Foreign Air Transport Operator	0	0	0	20	0.8	0.0	0.8	21.8
Part 135 Air Operator Helicopters and Small Aeroplanes	0	2	18	88	1.3	3.8	32.5	77.5
Part 137 Agricultural Aircraft Operator	0	2	18	44	0.3	2.5	19.3	59.3
Part 139 Aerodrome Operator	0	0	1	17	0.0	0.0	0.0	23.3
Part 140 Aviation Security Service Organisation	0	0	0	1	0.0	0.0	0.0	0.5
Part 141 Aviation Training Organisation	0	0	3	20	0.0	0.3	2.0	29.0
Part 145 Maintenance Organisation	0	1	1	20	1.0	0.0	1.8	26.8
Part 146 Aircraft Design Organisation	0	0	0	8	0.0	0.0	0.8	8.0
Part 148 Aircraft Manufacturing Organisation	1	0	1	7	0.0	0.0	0.8	9.0
Part 149 Aviation Recreation Organisation	0	0	2	4	0.3	0.5	0.3	4.0
Part 171 Telecom Service Organisation	0	0	0	1	0.0	0.0	0.0	1.0
Part 172 Air Traffic Service Organisation	0	0	0	0	0.0	0.0	0.5	0.5
Part 173 Instrument Flight Procedure	1	0	0	1	0.0	0.0	0.3	1.8
Part 174 Meteorological Service Organisation	0	0	0	2	0.0	0.0	0.3	0.8
Part 175 Aeronautical Info Service Organisation	0	0	0	0	0.0	0.0	0.0	0.0
Part 19F Supply Organisation	0	1	3	32	1.0	0.0	2.0	35.5
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	1.5

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

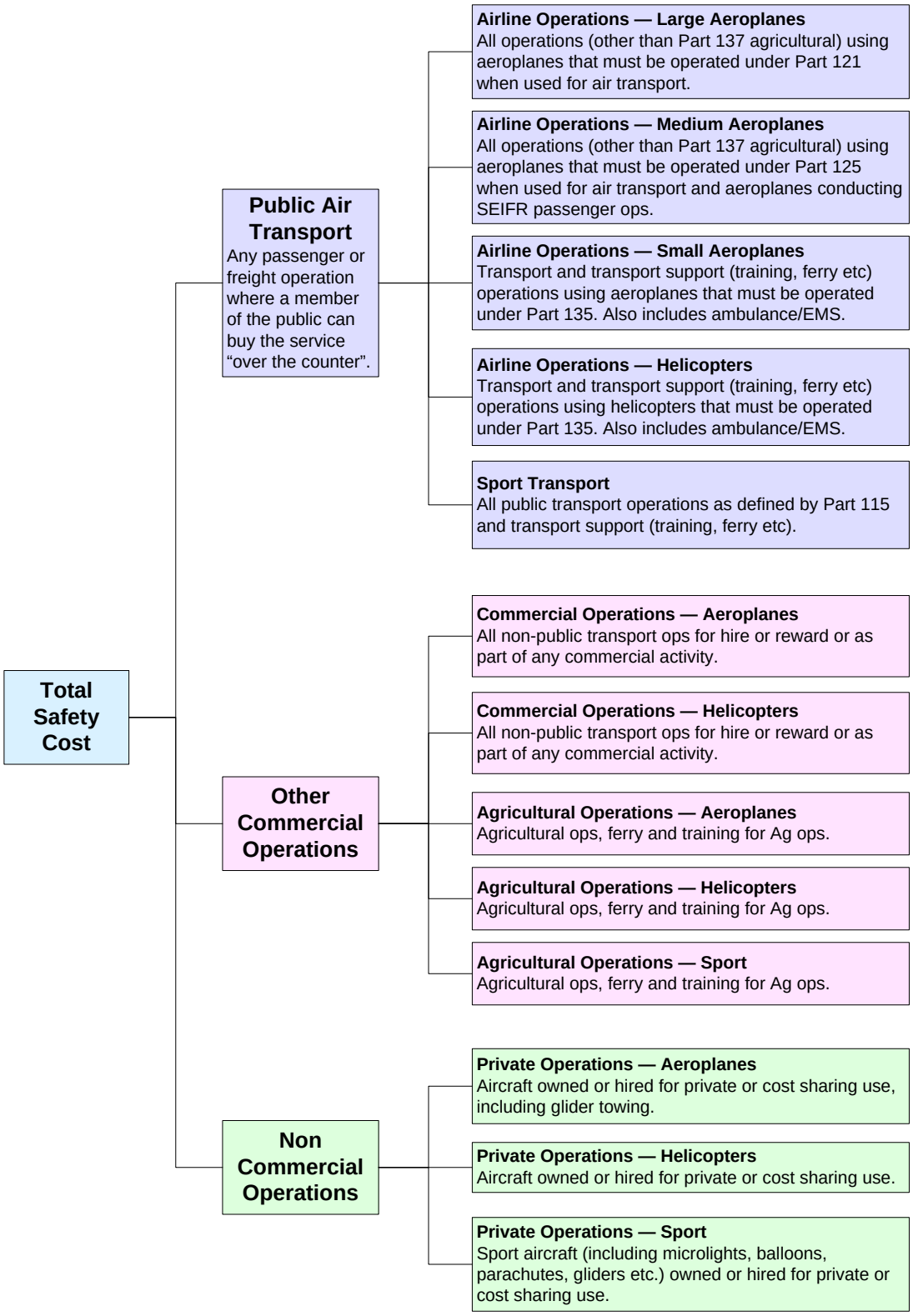
(6) involves verified exposure to infectious substances or injurious radiation.

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.
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.

Safety Failure

We have taken a Safety Failure as:

- an accident including hang glider and parachute or
- an incident where the aircraft is written off, destroyed or missing or
- a critical or major incident or
- an incident that has any of the following 31 selected descriptors, most of which relate to collision, serious landing outcomes, serious aircraft technical or operational failures or acts of violence

INJURIES TO PERSONS
FUEL/FLUIDS OCCURRENCE
LANDING OVERRUN
RUNWAY EXCURSION
General Breakup/disintegration
COLLISION/STRIKE OBJECT
Collision Level Terrain/water
Collision Hill/mountain
COLLISION WITH AIRCRAFT ON GROUND
DAMAGE TO AIRCRAFT
ENGINE POWER LOSS
Uncontained Failure
Engine Tearaway
PROPELLOR FAILURE
Propellor Separation
Propellor Runaway
FIRE/EXPLOSION/FUMES
Explosion
Struck By Propellor/rotor/jet Blast
TAKE-OFF OR LANDING
Landing Beside Runway
Undershoot
Overrun
Unintentional Wheels Up Landing
Nose Down/overturned
Critically Low Or Exhausted
Contaminated
Incorrect Type
ACT OF VIOLENCE
Aircraft excursion
Collision

Close Call

We have defined a Close Call as an incident that is not a safety failure but that has any of the following 112 selected descriptors that support the assumption that failure would have been the outcome if either the condition had escalated or adequate compensating action had not been taken.

ENGINE(S) SHUTDOWN
SIGNIFICANT LOSS OF CONTROL/PERFORMANCE
AVOIDING ACTION
OVERWEIGHT LANDING
ABNORMAL LANDING
AIRFRAME FAILURE
Initial Failure Of Control Surface
Initial Failure Of Fuselage
Initial Failure Of Empennage
Initial Failure Of Wing
Initial Failure - Other
Aircraft Standing
Aerodrome Structure
Animal (not Bird)
Bird
Chimney/mast/pole
Ditch
Embankment
Fence/fence Post
Person
Building
Approach Lights
Taxiway/runway Lights
Tree
Vehicle
Wire/cable/powerline
Other
NEAR COLLISION /STRIKE OBJECT
NEAR COLLISION AIRCRAFT ON GROUND
NEAR COLLISION TERRAIN
Both Moving On Ground

COMPONENT/SYSTEM MALFUNCTION
Avionics
Brake
De-icing
Doors/panels
Electrical
Flight Controls
Fuel
Gear
Hydraulic
Instruments
Navigation System
Pneumatic
Pressurisation
Tyre/wheel
Main Rotor
Tail Rotor
Main Rotor Transmissions/gearbox
Maint Rotor Tail Shaft
Tail Rotor Drive Shaft
Struck By Propellor / Rotor / Jet Blast
Sinking Through Surface
Struck By Object
Struck By Stairs / Equipment
GEAR COLLAPSED/RETRACTED
Main Gear
Nose Gear
Complete Gear
Other Gear
LOSS OF CONTROL
Directional Control
Mush/stall
Spin
Spiral
Pitch Control (porpoise)
Other
LOSS OF CONTROL (HELICOPTER)
Dynamic Roll-over (heli)
Inadequate Rotor Rpm (heli)
Settling With Power (heli)
Uncontrolled Rotation (heli)
Other
Fuel Starvation
Mechanical/engine Failure
Non Mechanical Engine Failure
Simulated Engine Failure
Transmission Failure
Driveshaft Failure
Unspecified
Fire
Fumes/smoke
Other
EVACUATION
Insecure Barrier
Scraped Wingtip/cowling/float
Tail Scrape/overrotation
Groundloop/swerve
Hard Landing
Wheels Down Landing On Water
Intentional Wheels-up Landing
Intent Unknown Wheels-up Landing
MISSING AIRCRAFT
Fire/smoke/fumes
Gpws
FAILURE OF EMERGENCY EQUIP/PROCS
EMERGENCY DECLARATION
Incorrect Quantities Loaded
Airspace Incident
NEAR COLLISION
AIR PROXIMITY
Near Miss
Runway Incursion Category A
Runway Incursion Category B
SPILLAGE/LEAKAGE
FUMES/GAS/SMOKE
SABOTAGE
HIJACK/UNLAWFUL SEIZURE
BOMB/DEVICE WARNING/SCARE
Endangering transport
UNLAWFUL INTERFERENCE
Theft

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

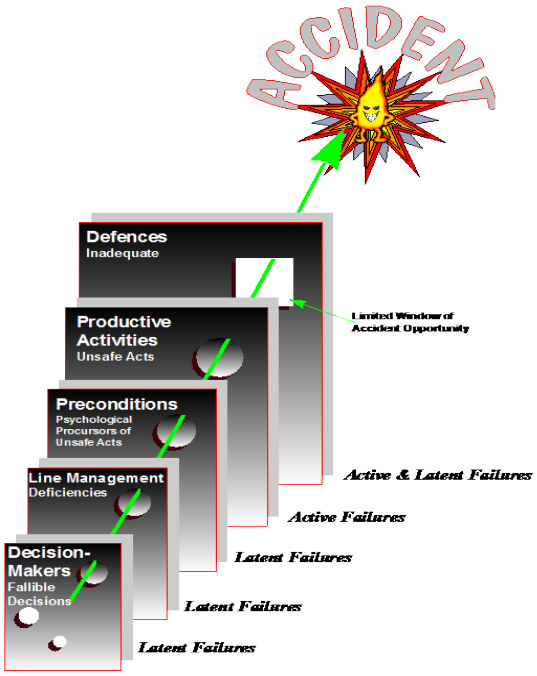


Diagram 1 shows the layers of defences that have been created within the aviation system to prevent accidents and incidents happening. It also shows how these defences have holes in them. When these holes line up there is a window of opportunity for an accident or incident. All that is needed to complete 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

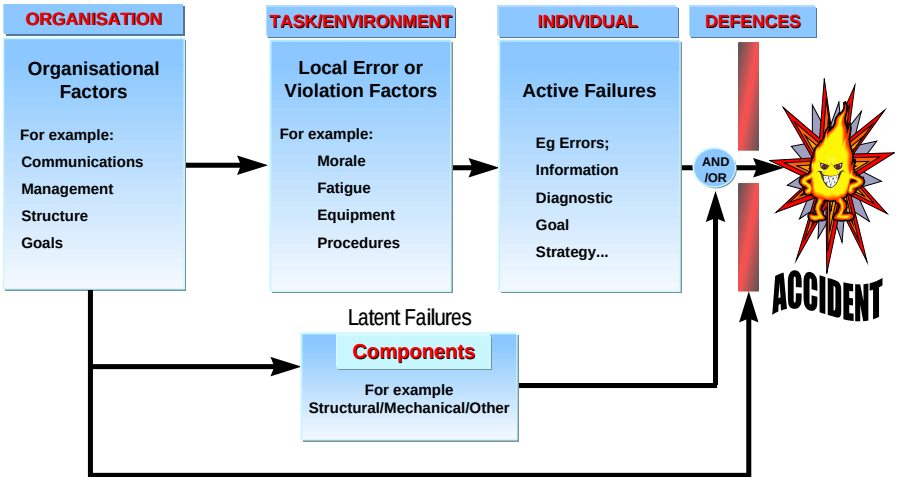


Diagram 2 shows how the latent failures are grouped into 3 areas:

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.