



HELICOPTER SAFETY & LOSSES

ANNUAL REVIEW

2016



2016 – Same old, same old?

The safety of civil turbine helicopters¹ improved again in 2016 but this improvement is still only just keeping up with the growth of the industry. While accident rates, on average, have been getting better for about the last 15 years, the number of fatal accidents and fatalities suffered by this class of aircraft in 2016 show little improvement over previous years.

In 2016, civil western-built turbine helicopters suffered 168 known accidents, of which 50 resulted in fatalities, killing 136 passengers and crew. In 2015, there were 201 known accidents including 60 involving fatalities, giving rise to 172 passenger and crew deaths. The year 2016 shows an improvement over 2015 but remains almost identical to the annual averages for the last five years of 51 fatal accidents and 130 fatalities.

During 2016 there were no known accidents involving deaths or serious injuries on the ground. In the last five years, there have been eight accidents where people were killed or seriously injured on the ground. These accidents resulted in eight ground fatalities and 19 people being seriously injured.

Fatal Accident Rates

The western-built turbine helicopter fatal accident rate in 2016, at one per 440 helicopters in service², was some 20% better than in 2015, when the rate was about one per 365 helicopters. However, this was still worse than in 2014 when the rate was about one per 560 helicopters. 2014 was the safest year ever, on this basis, for this class of helicopter, and 2016's result makes it the second best year ever. The annual average for the last five years is now one fatal accident per 415 helicopters in service.

The western-built turbine helicopter fatal accident rate for the decade of the 1990s was one per 224 helicopters while that for the 2000s was one per 300 helicopters. The rate for this decade so far (2010-2016), is one per 382 helicopters. On average, Western-built turbine helicopters are now twice as safe as they were at the start of the 1990s.

The fatal accident rate for multi-engine helicopters in 2016 was one per 615 helicopters. During the decade of the 1990s, the rate was one per 230 helicopters while that for the 2000s was one per 332. The rate for this decade (2010-2016) is one per 523 helicopters.

The fatal accident rate for single-engine helicopters in 2016 was one per 375 helicopters, considerably better than the annual average for the first seven years of this decade (2010-2016) which was one per 330 helicopters. The fatal accident rate for the 1990s was one per 222 helicopters and for the 2000s one per 286 helicopters.

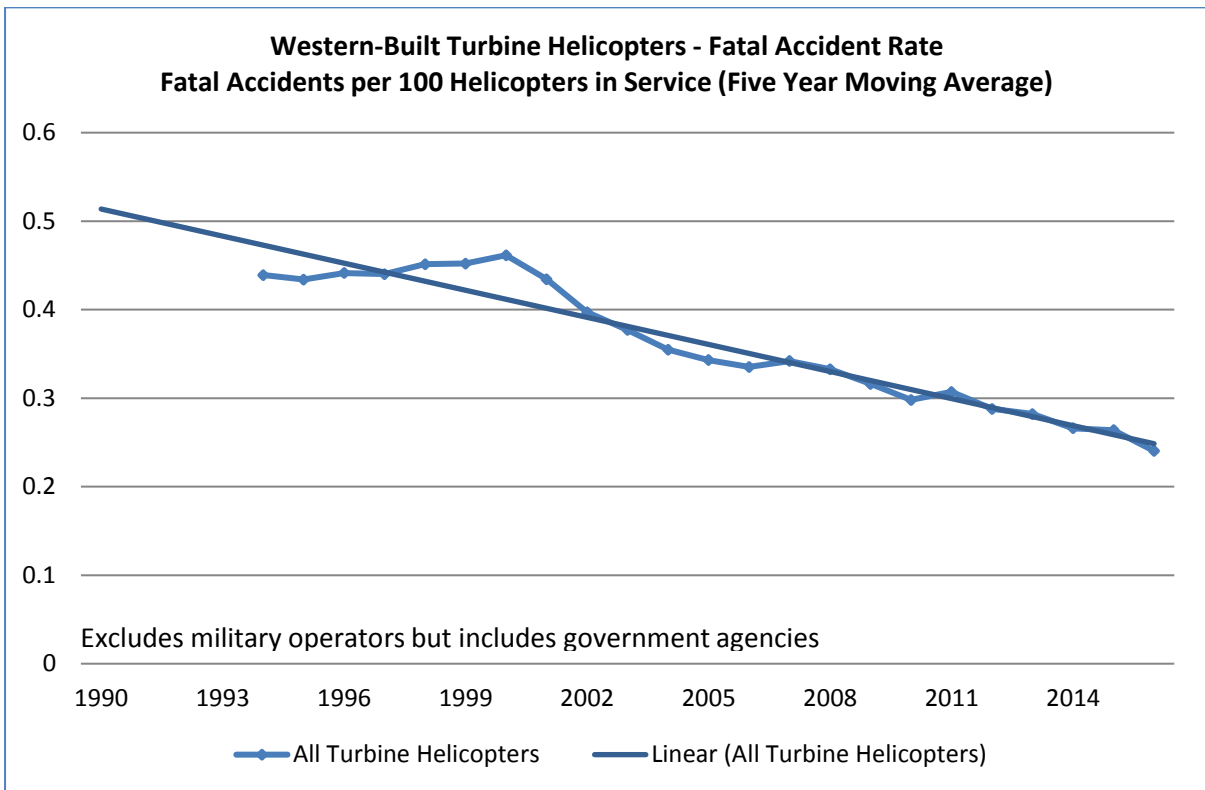
¹ Western-built turbine helicopters only. Includes helicopters operated by government agencies whether civil registered or not. Excludes deliberate acts of violence.

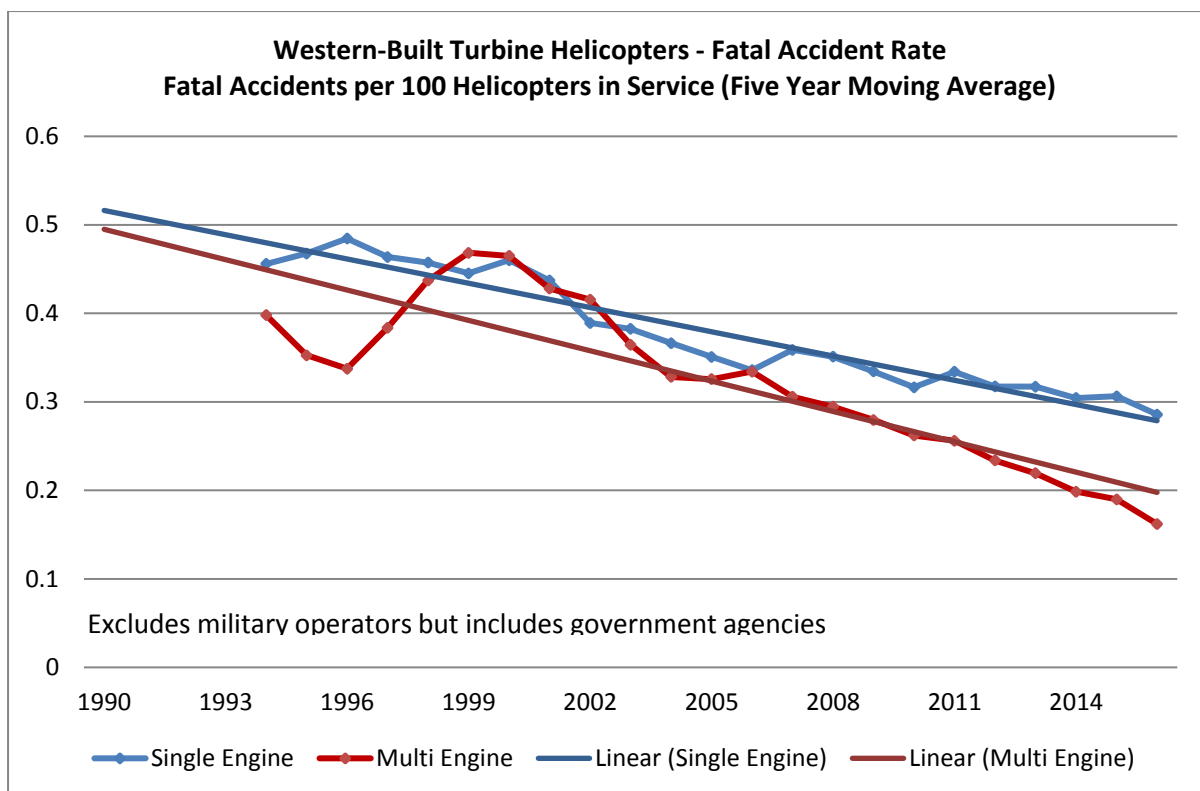
² Accident Rates. Currently we do not have good data for the number of flights etc on a global basis for this class of aircraft to allow us to calculate accident rates in the form of, for instance, "fatal accidents per million flights". However, we do have good fleet data and this allows us to use "aircraft years" (average number of aircraft in the fleet) and "seat years" as measures of exposure when calculating accident rates. Nevertheless, although these rates do give a good indication of trends over the longer term, possible changes in utilisation from year to year should be borne in mind when comparing one year to another.

Annual Fatal Accident Rates (Western-built Turbine Helicopters) – Last 10 Years										
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
All	0.33	0.31	0.25	0.29	0.35	0.24	0.28	0.18	0.28	0.23
Single	0.37	0.34	0.27	0.32	0.37	0.29	0.33	0.22	0.33	0.27
Multi	0.25	0.27	0.21	0.23	0.31	0.15	0.20	0.11	0.19	0.16

Fatal accidents per 100 helicopters at risk

The underlying trend in the fatal accident rate for western-built turbine helicopters, both as a whole and separately for single and multi-engine helicopters, is down and has been improving since about 2000. However, the fall in the accident rate for single-engine helicopters as a whole has not been keeping up with that for multi-engine helicopters. Both classes of helicopter had similar fatal accident rates ten to 15 years ago but since then the multi-engine helicopters have improved considerably and their fatal accident rate is now some 75% better than that of the single-engine helicopters.





Fatal Accidents

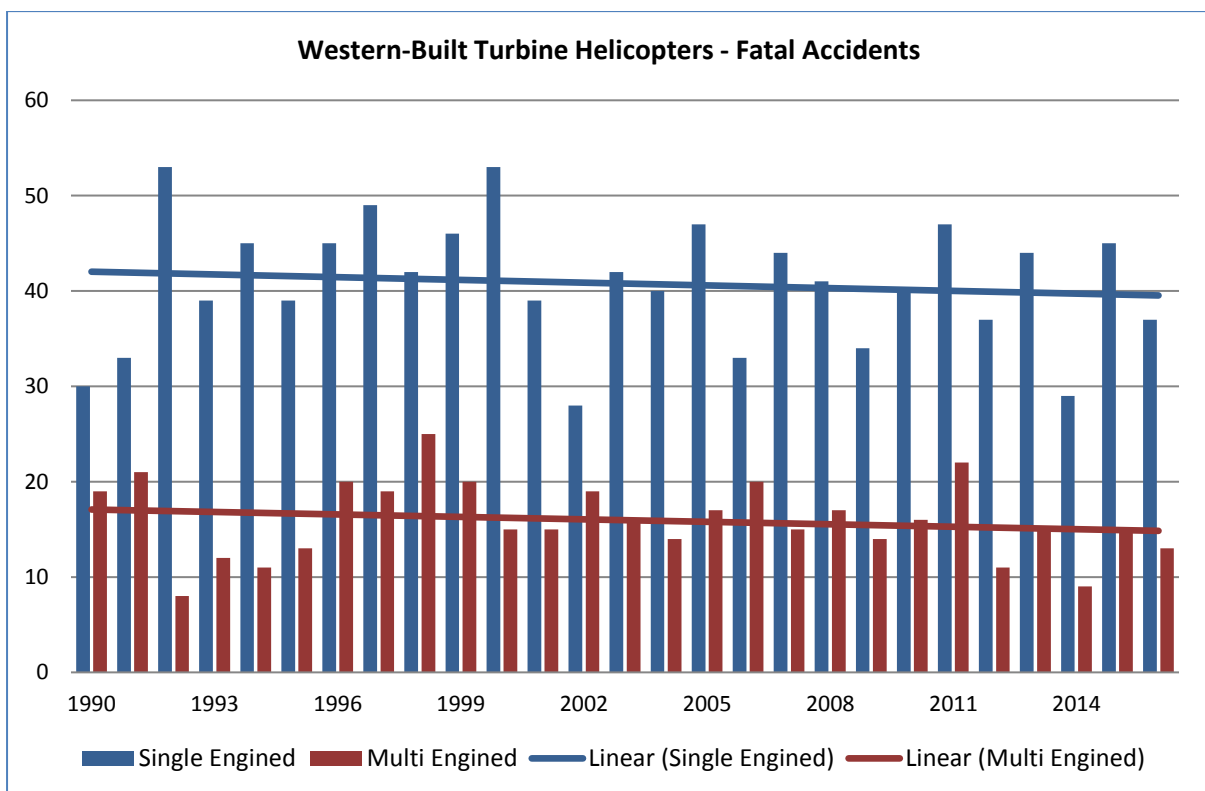
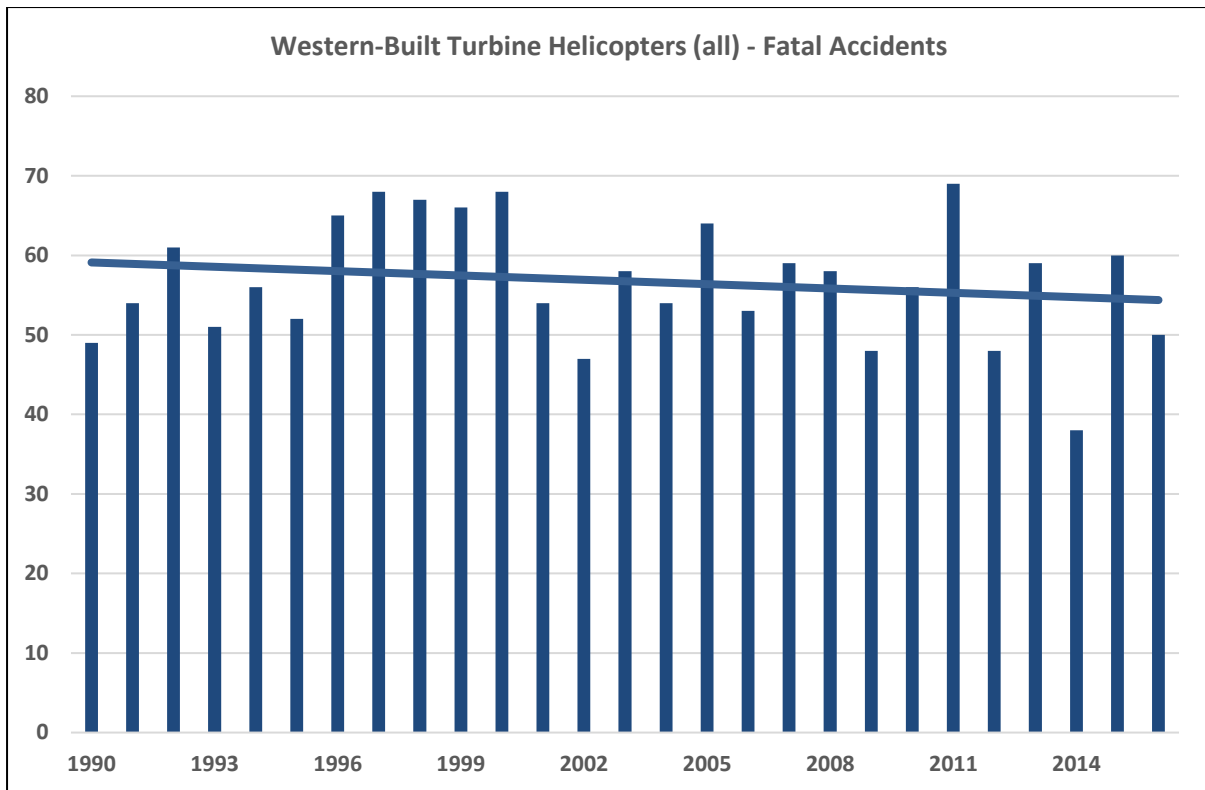
Turbine helicopters suffered 50 fatal accidents last year, 10 less than in 2015, when there were 60 such accidents, but 12 more than in 2014. There were fewer fatal accidents in 2014 than in any year since at least 1990 but 2016 was more in line with what might be expected. The year 2011, with 69 fatal accidents, was the worst year since 1990.

Despite the improving fatal accident rate, there has been no significant reduction in the annual number of fatal accidents for many years with, on average, still about 56 a year. The number of helicopters in operation has been increasing so safety is keeping up with the expansion of the industry, but has not improved to the point where the number of fatal accidents in a year begins to decline.

Single-engine helicopters suffered 37 fatal accidents in 2016, eight less than in 2015 but eight more than in 2014. The lowest number of fatal accidents in any year since at least 1990 was in 2002 when there were 28. The years with the most such accidents were 1992 and 2000 when there were 53. The number of single-engine fatal accidents in 2016 was slightly below the long-term trend of 39 or 40 per year.

There were 13 fatal accidents to multi-engine helicopters in 2016, two less than in 2015 and the long-term trend.

Although there have been individual good and bad years, neither single nor multi-engine helicopters have shown any significant improvement in the frequency of fatal accidents for more than 25 years.

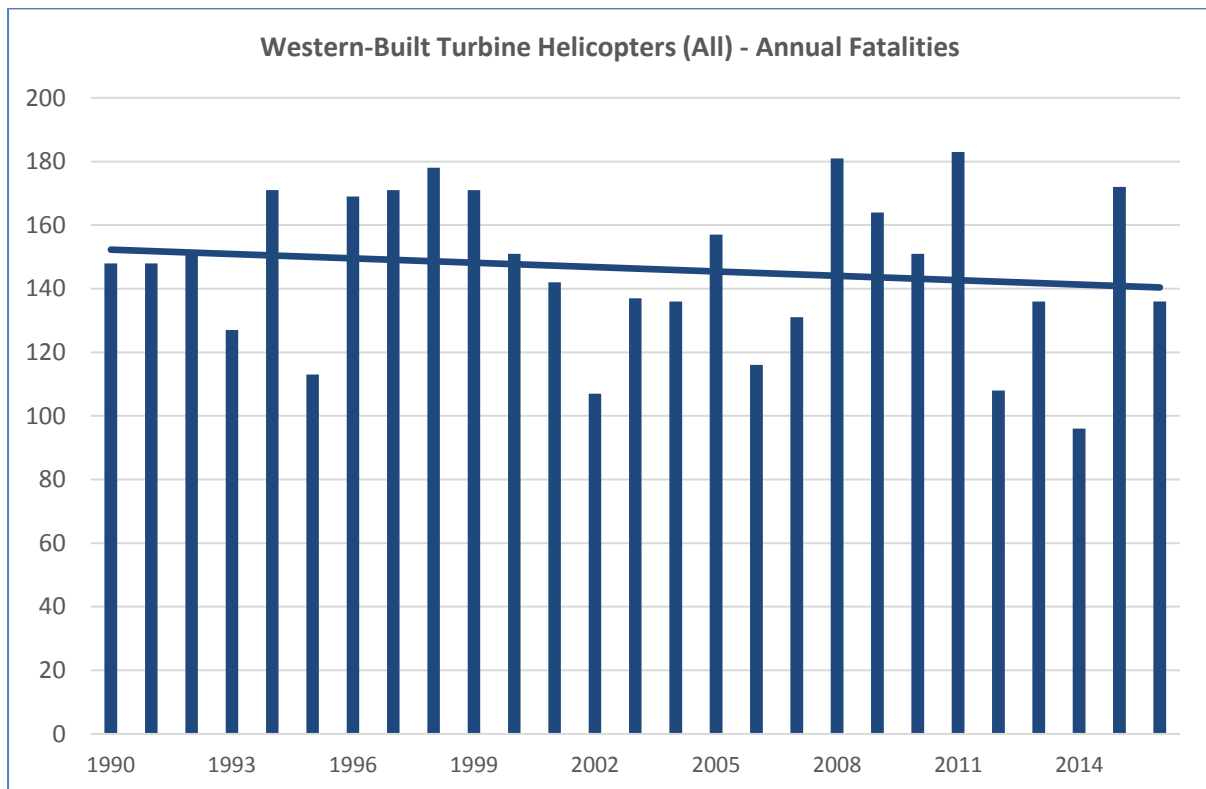


Annual Fatal Accidents (Western-built Turbine Helicopters) – Last 10 Years										
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
All	59	58	48	56	69	48	59	38	60	50
Single	44	41	34	40	47	37	44	29	45	37
Multi	15	17	14	16	22	11	15	9	15	13

Fatal accidents involving passenger and/or crew deaths

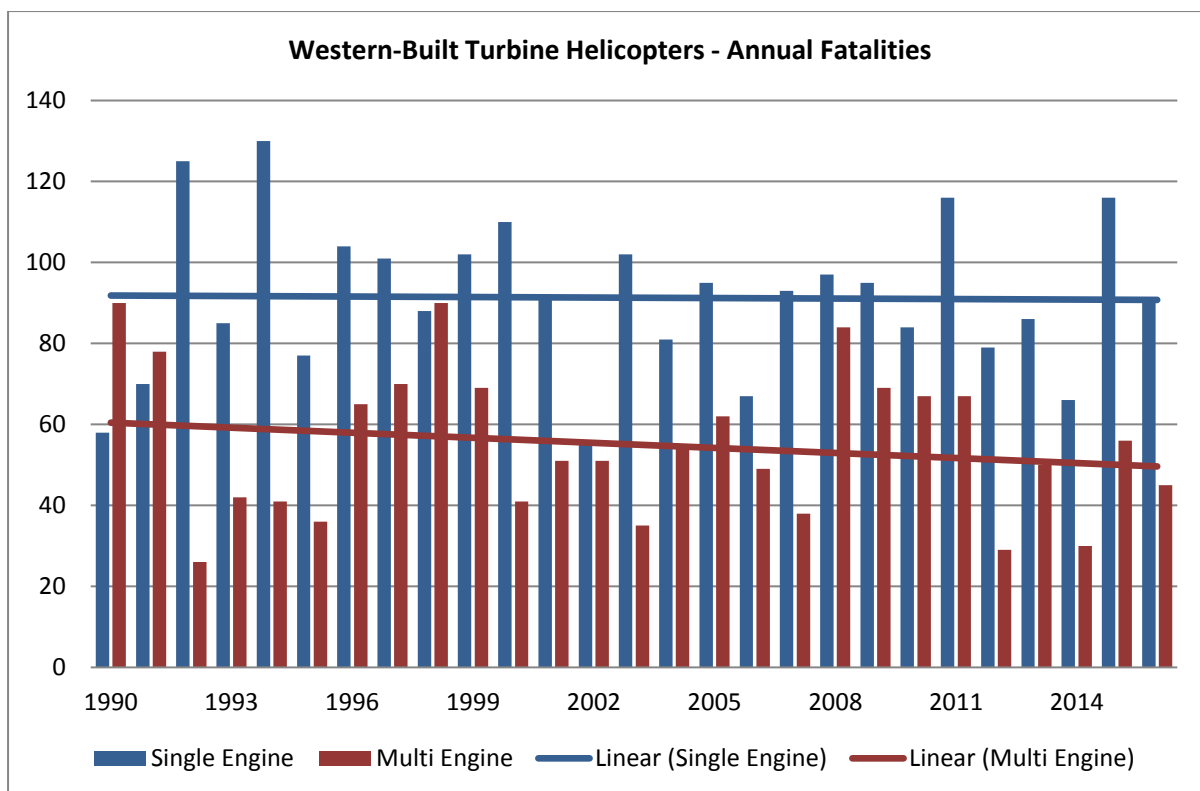
Fatalities

A total of 136 passengers and crew died in the 50 fatal accidents during 2016, giving a simple average of about 2.7 fatalities per accident. There were 36 fewer fatalities in 2016 than in 2015 but 40 more than in 2014. However, last year's result was very similar to the long-term trend, which is currently at about 140 fatalities per year.



Some 91 passengers and crew died in the 37 fatal accidents suffered by single-engine helicopters in 2016, giving a simple average of about 2.5 fatalities per fatal accident. This is down on 2015, when this class of helicopter suffered 45 fatal accidents killing 116 passengers and crew. The 2016 result is identical to the long-term trend. As with the trend in the number of fatal accidents, there has been no improvement in the number of fatalities per year on this class of helicopter for more than 25 years.

Forty-five passengers and crew died in the 13 fatal accidents suffered by multi-engine helicopters in 2016, giving a simple average of 3.5 fatalities per fatal accident. The 2016 death toll showed an improvement over 2015 when 56 people died in 15 fatal accidents. Unlike single-engine helicopters, there has been some improvement in the annual number of fatalities in accidents involving multi-engine helicopters over the period since 1990.



Annual Fatalities (Western-built Turbine Helicopters) – Last 10 Years										
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016P
All	131	181	164	151	183	108	136	96	172	136
Single	93	97	95	84	116	79	86	66	116	91
Multi	38	84	69	67	67	29	50	30	56	45
Passenger and crew fatalities										

The worst accidents in 2016 included:-

- CHC Helikopter A/S H225 (LN-OJF) on 29 April which killed the two crew and 11 passengers on board when it lost its main rotor while inbound to Bergen, Norway from the Statoil Gullfaks B platform in the North Sea.
- Fishtail Air AS350B2 (9N-AKA) on 8 August, which apparently flew into high ground near Madanpur in 'poor' weather while en route between Gorkha and Kathmandu, killing the pilot and six passengers
- Skyline Aviation AS350B3e (RP-C6828), on 5 May, which crashed near Betong, Sarawak, Malaysia while en route from Betong to Kuching, killing the pilot and five passengers on board.
- Heli Malongo Airways Bell 430 (D2-EYI) on 29 September, which crashed into the sea while en route from Malongo, Angola to the Tombua-Landana platform about 80km off shore. The two crew and four passengers were killed .

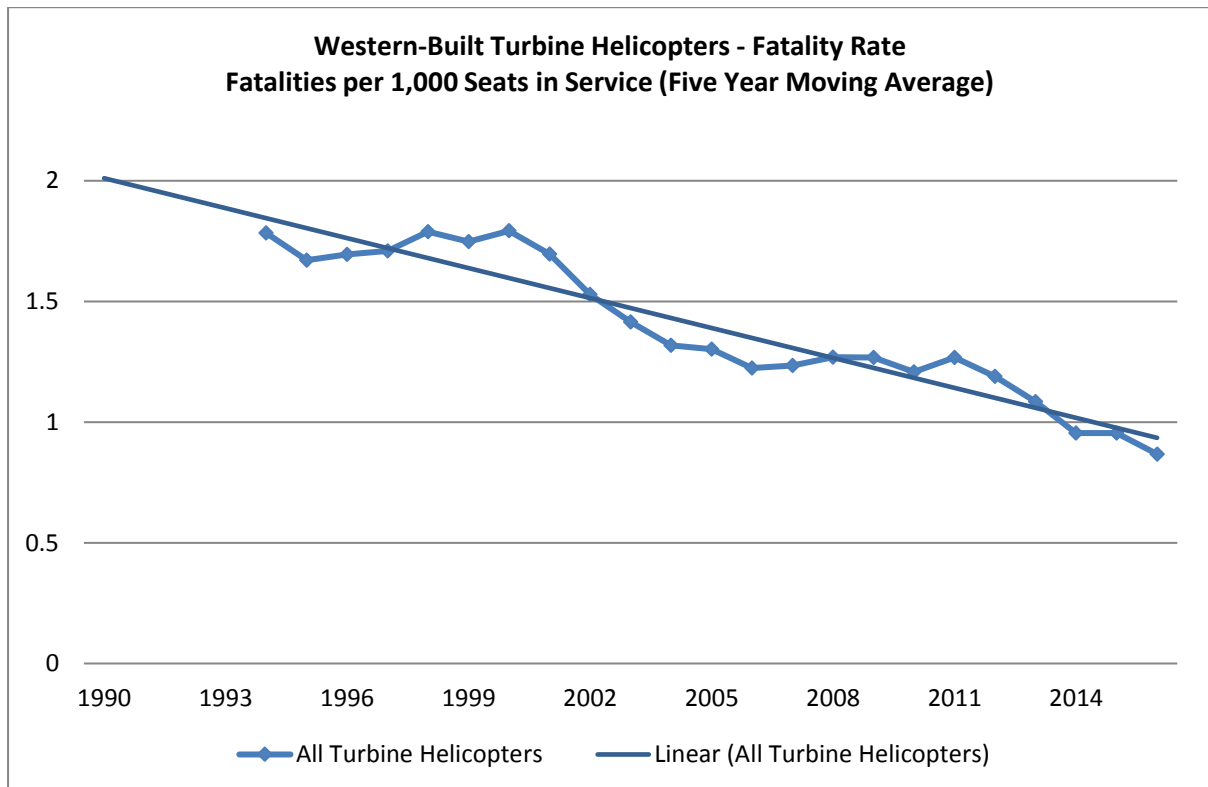
Fatality Rates

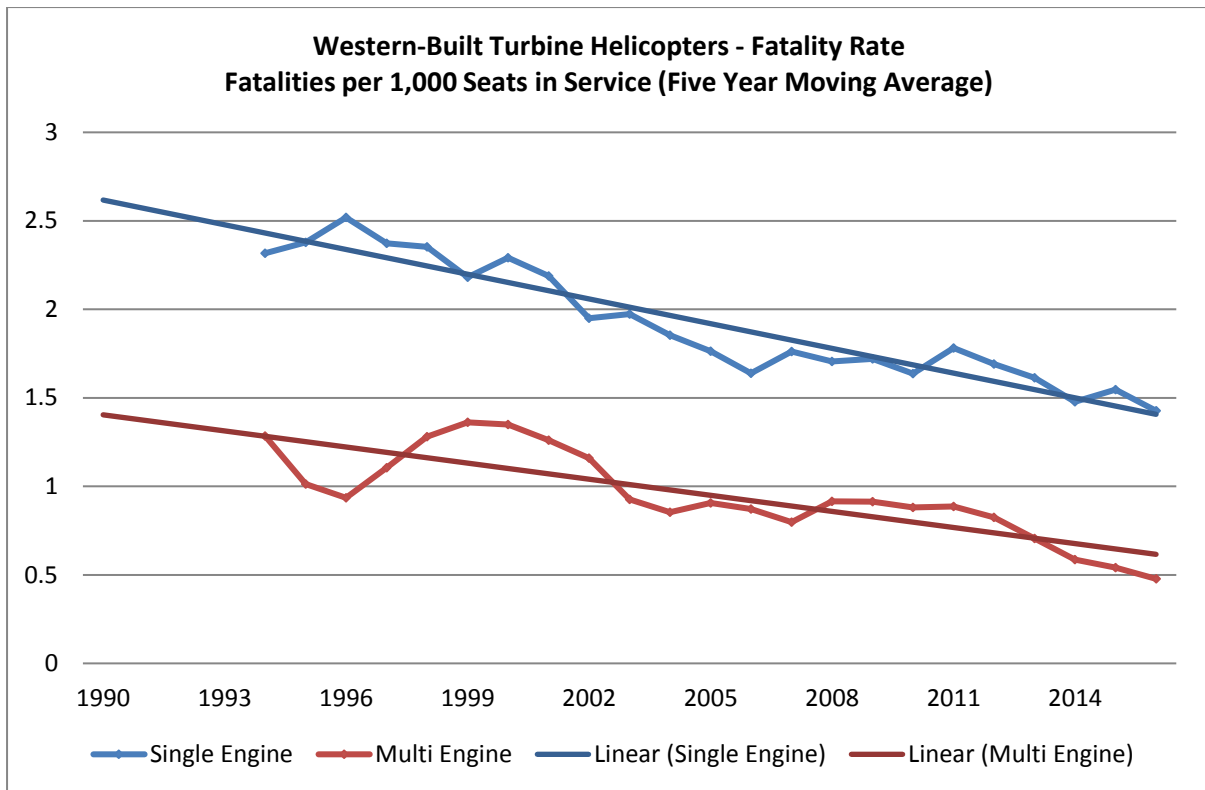
The fatality rate in 2016, on a deaths per 1,000 seats basis, showed an improvement over 2015.

Single-engine helicopters produced a better result than in 2015, going from about one death per 550 seats, to about one per 700 seats last year. Multi-engine helicopters improved from one per 1,640 seats in 2015 to one per 2,000 in 2016.

Fatality rates for turbine helicopters as a whole are still improving and, on this basis, the class is about twice as safe as it was 25 years ago.

Annual Fatality Rates (Western-built Turbine Helicopters) – Last 10 Years										
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
All	1.12	1.46	1.27	1.13	1.35	0.77	0.93	0.64	1.11	0.88
Single	1.80	1.82	1.73	1.50	2.06	1.36	1.44	1.07	1.83	1.42
Multi	0.58	1.20	0.93	0.87	0.84	0.35	0.58	0.34	0.61	0.50
Fatalities (passengers and crew) per 1,000 seats in service										





Paul Hayes, London, 23 February, 2017

The information contained in our databases and used in this report has been assembled from many sources and, while reasonable care has been taken, we are unable to give any warranty as to its accuracy, completeness or suitability for any purpose and the information is supplied on the understanding that no legal liability whatsoever shall attach to Ascend Worldwide Limited, its officers, or employees in respect of any error or omission that may have occurred. In providing this data, no consideration has been made of the interests and concerns of any third party and Ascend denies any responsibility howsoever arising to any third party in the use of this data.

Aircraft accidents & loss data

No other data provider delivers the depth, range and integrity of our authoritative aircraft accident and loss information, built on 60 years of comprehensive global data.

Aviation authorities including the International Civil Aviation Organisation (ICAO), the US Federal Aviation Administration (FAA) and the UK Civil Aviation Authority (CAA) turn to Ascend for our timely and detailed accident reports; global insurers value our unrivalled expertise in analysing safety trends and delivering reliable recommendations on air safety improvements.

Our Air Safety team uses its unique range of data, industry sources and contacts to deliver tailored-made solutions and provides immediate assistance to any air safety related enquiry.

The aviation industry relies on Flightglobal for the most reliable and up-to-date information and insight available

For almost five decades, our international team of experts has delivered independent and trusted advice to help companies achieve results and drive profitable performance.

All over the world, tens of thousands of market opinions are sought using Flightglobal information. Our rich source of proprietary data sources and analytical capabilities are second to none.

Contact us

Twitter: [Twitter.com/AscendAviation](https://twitter.com/AscendAviation)

LinkedIn: LinkedIn group 'Ascend – Air Safety & Insurance'

Web: www.flightglobal.com/Reports