HELICOPTER SAFETY & LOSSES ANNUAL REVIEW 2018
2018 – No real change

The safety of western-built civil turbine helicopters\(^1\) in 2018, as measured by the fatal accident rate, was more or less within the long-term trend but, as noted in previous years, this improvement is still only just keeping up with the growth of the industry. While accident rates, on average, have been getting better over the last 20 or so years, the frequency of accidents - the number of fatal accidents and fatalities suffered by this class of aircraft each year - is only reducing slowly.

In 2018, civil western-built turbine helicopters suffered some 147 known operational accidents, of which 51, about 35 per cent of the total, resulted in fatalities. These accidents killed 145 passengers and crew. In 2017, there were 155 known accidents including 47 involving fatalities, giving rise to 121 passenger and crew deaths. The 2018 numbers are slightly worse than in 2017 but still more or less in line with expectations.

Fatal Accident Rates

The western-built turbine helicopter fatal accident rate in 2018, at one per 450 helicopters in service\(^2\), despite being more or less on trend, was slightly worse than in 2017, when the rate was about one per 475 helicopters. 2018 was better than in 2016 when it was one per 435 helicopters. In 2014, the safest year ever for this class of helicopter, the rate was about one per 560 helicopters. Nevertheless, despite 2018’s relatively poor result, the long-term trend has been improving more or less continuously for about the last 20 years and, using this metric, the class is now, on average, twice as safe as it was 30 years ago.

The annual average for the last five years is now one fatal accident per 450 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 - 2018), is one per 400 helicopters.

The fatal accident rate for multi-engine helicopters in 2018 was one per 500 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 so far (2010 - 2018) is one per 540 helicopters.

The fatal accident rate for single-engine helicopters in 2018 was about one per 415 helicopters, considerably better than the annual average for the first nine years of this decade (2010 - 2018) which was one per 350 helicopters. The fatal accident rate for the 1990s was one per 222 helicopters and for the 2000s one per 286 helicopters.

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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

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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 markedly better than that of the single-engine helicopters.
Fatal Accidents

Western-built turbine helicopters suffered 51 known fatal accidents last year, four more than in 2017, when there were 47 such accidents, but the same number as in 2016. There were 60 fatal accidents in 2015. There were considerably fewer fatal accidents in 2014, when there were 38 such accidents but that year produced the best result of any year since at least 1990. The year 2011, with 69 fatal accidents, was the worst year since 1990.

The 2018 was still better than the long-term trend, which stood at around 52 fatal accidents per year in 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 52 per year. In the almost 30 years since 1990, the number of fatal accidents has reduced by about 13% - less than half an accident per 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 accident frequency has declined markedly.

Single-engine helicopters suffered 34 known fatal accidents in 2018, one fewer than in 2017 and three fewer than in 2016 but still five more than in 2014 when there were only 29 such accidents. 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 2018 fell below the long-term trend, which currently stands at about 39 per year. The trend in the annual number of fatal accidents to single-engine helicopters has been slowly falling, reducing from about 43 per year in the early 1990s to 39 now. A fall of only about four over a period of thirty years.
There were 17 fatal accidents to multi-engine helicopters in 2018, five more than in 2017 and three more than in 2016. 2017’s result is the worst since 2011 when there were 22 such accidents. 2017’s result is also up on the long-term trend, which is currently at about 15 fatal accidents per year.

As with single-engine helicopters, multi-engine helicopters have shown only a slight improvement in the frequency of fatal accidents over the last 30 years with the trend falling from about 17 or 18 per year in the early 1990s to about 15 now.
Annual Fatal Accidents (Western-built Turbine Helicopters) – Last 10 Years

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Fatal accidents involving passenger and/or crew deaths

Fatalities

A total of 145 passengers and crew died in the 51 fatal accidents during 2018, giving a simple average of about 2.8 fatalities per accident, a slight increase on the average for 2017, which was 2.6 and for 2016, which was 2.7. However, there were 24 more fatalities in 2018 than in 2017 and eight more than in 2016. The worst recent year was 2011 when 183 passengers and crew were killed in this class of helicopter. Last year’s result was slightly above the long-term trend, which is currently at about 140 fatalities per year.
Some 77 passengers and crew died in the 34 known fatal accidents suffered by single-engine helicopters in 2018, giving a simple average of about 2.3 fatalities per fatal accident. This is one fewer accident but nine more fatalities than in 2017. In 2016, this class of helicopter suffered 37 fatal accidents killing 91 passengers and crew and in 2015, there were 45 fatal accidents killing 116. The 2018 result is still significantly below the long-term trend, which now stands at a little under 90 fatalities per year.

Despite 2018’s good result, the trend in the number of annual fatalities on board single-engine helicopters has only improved by about 7 per cent in the last 30 years.

Sixty-eight passengers and crew died in the 17 fatal accidents suffered by multi-engine helicopters in 2018, giving a simple average of 4.0 fatalities per fatal accident. This is a worse death toll than in 2017 when 53 people were killed in 12 fatal accidents and the worst result since 2009 when 69 passengers and crew died in these helicopters. 2018’s result was also well above the long-term trend line which currently stands at about 50 fatalities per year.

Although 2018’s result is above the trend, there has still been a greater improvement in the annual number of fatalities in accidents involving multi-engine helicopters than in single-engine ones over the last 30 years. The trend has reduced by about 15 per cent since 1990, falling from about 60 per year then to about 50 per year now.
The worst accidents in 2018 included:-

- **Toho Air Service** Bell 412EP (JA200G) on 10 August which killed the four crew and five passengers on board when it crashed near Mount Shirane, near Kusatsu, Japan while checking a new ridge line hiking trail.

- **Pawan Hans Helicopters** Airbus Helicopters AS365N3 (VT-PWA) on 13 January, which crashed into the Arabian Sea while en route from Juhu Airport, Bombay to an oil rig in the Mumbai High North field some 160km off shore, killing the two crew and five passengers on board.

- **Cristalia Produtos Farmaceuticos** Leonardo AW109SP (PT-FPS), on 24 November, which crashed on a wooded hillside in the Serra da Mantiqueira towards the end of a flight from Itapeva to Campos do Jordao, Sao Paulo, Brazil in poor visibility, killing the two crew and four passengers on board.

- **National Airborne Service Corps** Sikorsky UH-60M (NA-706) on 5 February, which crashed into the sea shortly after take-off from Lanyu (Orchid) Island, Taiwan during a medevac flight to Taitung. The three crew and three passengers on board were killed.

- **Servicios Aereos del Altiplano** Leonardo AW109S Grand (XA-BON) on 24 December, which was destroyed by impact and post impact fire when it crashed in fields in the Santa Maria Coronango district of Puebla, Mexico shortly after take-off.
on a flight to Mexico City, killing the two crew and three passengers on board. Amongst those killed in the accident were the governor of Puebla State, Martha Erika Alonso and her husband, Federal Senator Rafael Moreno Valle.

- **Filipinas Empreend Imobiliarios** Leonardo AW109E (PP-MTX) on 3 November, which crashed in woods near Quatinga, Sao Paulo, Brazil while en route from Juquei to Osasco, Sao Paulo, killing the pilot and four passengers on board.

- **Amadeus Aviation/King Power International** Leonardo AW169 (G-VSKP) on 27 October, which was destroyed by impact and post impact fire when it crashed beside a car park at the southeast corner of the King Power Stadium, Leicester immediately after take-off from the stadium killing the pilot and four passengers on board. Amongst those killed in the accident was Vichai Srivaddhanaprabha, founder and CEO of King Power Duty Free and Chairman of Leicester City FC.

### Fatality Rates

The fatality rate in 2018, on a deaths per 1,000 seats basis, overall, showed a slight deterioration on 2017 going from one death per 1,315 seats that year to one per 1,125 in 2018.

Single-engine helicopters also produced a worse result than in 2017, going from about one death per 950 seats, to about one per 850 seats last year. Multi-engine helicopter performance deteriorated from one per 1,795 seats in 2017 to one per 1,430 in 2018.

Annual figures can be volatile, going up or down from one year to another; however, despite an occasional poor year, the trend in western-built turbine helicopter safety as measured by this fatality rate has shown an improvement over the years and, on this basis, the class is about twice as safe now as it was 30 years ago.
Annual Fatality Rates (Western-built Turbine Helicopters) – Last 10 Years

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Fatalities (passengers and crew) per 1,000 seats in service

Paul Hayes, London, 11 January, 2019

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