

Helicopter Safety

How to improve your mission safety.

Helicopter operators are confronted with many more hazards than fixed-wing operators. Helicopters spend a significant portion of their operating envelope close to the ground where they encounter trees, towers, wires, buildings, and other obstacles. When adverse weather conditions are present, helicopters operate through them and when landing, they are confronted with unfamiliar sites. Because of these operational challenges, the accident rate for rotary wing is higher than fixed-wing aircraft.

There are four main factors that contribute to helicopter accidents:

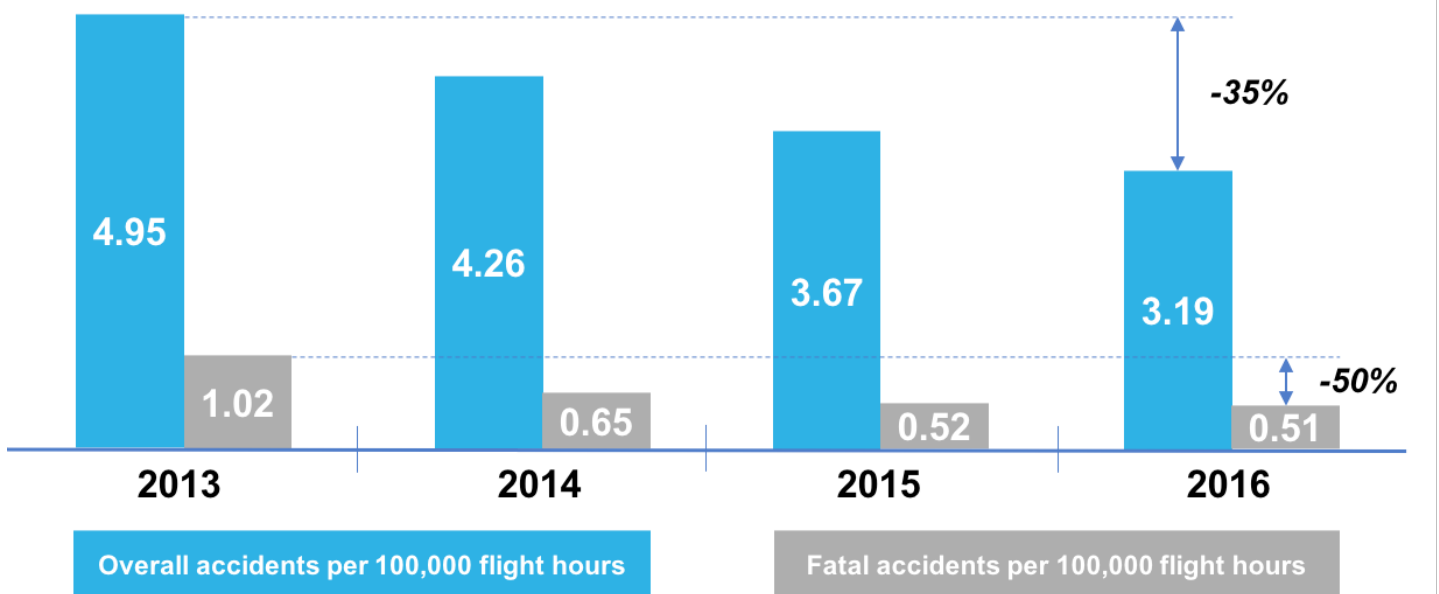
- Weather** – lack of visibility, turbulence, and wind shear
- Loss of control** – flight crew unable to maintain control of the helicopter in flight, resulting in an unrecoverable deviation from the intended flight path

•**Controlled flight into terrain** – under pilot control, an airworthy helicopter is unintentionally flown into terrain, water, or an obstacle

•**Night operations** – disorientation, lack of depth perception, and speed cues

The introduction of new avionics and operational tools have allowed helicopter operators to significantly improve the safety of their flights.

Operators can equip their helicopters with several safety upgrades that mitigate operational difficulties. These upgrades are both cost effective and reduce risks for several factors that contribute to helicopter accidents.



When using upgraded safety equipment, a significant reduction in overall and fatal helicopter accidents is shown (source: Federal Aviation Administration)

Weather-Related Accidents

Due to the altitude at which helicopters operate, weather can always be a risk. Furthermore, it is the cause of inadvertent Instrument Flight Rules (IFR) condition—when a crew enters IFR flight conditions even though crew members are only trained in Visual Flight Rules (VFR). Modern avionics can provide pilots with improved safety:

- **Real-time weather**
- **Electronic Flight Instrument System (EFIS)**
- **Helicopter Terrain Awareness and Warning System (HTAWS)**
- **Synthetic vision**
- **Traffic display**

Controlled Flight Into Terrain Accidents

The low operating altitude of the majority of helicopter flight plans significantly increases the risk of controlled flight into terrain or obstacles. Advanced avionics provide increased situational awareness:

- **HTAWS**
- **Synthetic vision**
- **Real-time weather**
- **EFIS instrumentation**
- **Night Vision Imaging Systems (NVIS)**

Loss of Control Accidents

Poor weather conditions, night operations, and close proximity to terrain and structures are some of the factors that contribute to loss of control accidents. Modern avionics reduce the likelihood of loss of control:

- **EFIS instrumentation**
- **Localizer Performance with Vertical guidance (LPV) approaches**
- **Synthetic vision and advanced symbology**
- **Flight Operational Quality Assurance (FOQA) data analysis after each flight**

Night Operations Accidents

Night operations exacerbate the already difficult conditions helicopter operators can encounter. The black hole phenomena in which a pilot loses spatial awareness of terrain and obstacles can now be reduced with safety upgrades:

- **NVIS**
- **EFIS instrumentation**
- **HTAWS**
- **Synthetic vision**
- **Video capabilities**

The Astronautics Solution

Astronautics' RoadRunner™ EFI and AFD 6800 family of displays offer IFR EFIS upgrade solutions for legacy cockpits providing HTAWS, traffic, and LPV approach functionality as well as NVIS compatibility and future growth to embedded synthetic vision. **Astronautics' Air-Ground Communications System (AGCS)** provides low-cost and highly-secure equipment to receive real-time weather data as well as to download FOQA data for analysis of possible mechanical issues. These upgrades are designed for ease of installation to minimize helicopter downtime.