
HELICOPTER FACTS

Helicopter Accidents During Night Operations

Purpose & Objective

This Fact Sheet provides background information and results from a study conducted by the USHST (www.USHST.org) on fatal night helicopter accidents. The objective of this analysis is to reduce the likelihood of a fatal helicopter accident occurring at night by increasing pilot awareness regarding the potential risks associated with night flight.

Background

The USHST analyzed 415 helicopter accidents from the years 2009, 2010 and 2011. Of these 415 accidents, 366 occurred during the day while the remaining 49 occurred at night. Furthermore, 66 of the 415 accidents were fatal: 53 daytime and 13 nighttime. Fourteen percent of the daytime accidents and 27 percent of the nighttime accidents were fatal. These findings are consistent with the results gathered from a different but similar analysis conducted by the USHST for the years 2000, 2001 and 2006 accident studies.

The FAA's General Aviation Survey reveals that approximately 16 percent of all helicopter missions are conducted at night. Unfortunately, the risk associated with being involved in a fatal helicopter accident is almost double for accidents occurring at night compared to accidents occurring during day light hours.

For calendar years 2009 – 2011, the USHST's Measurement and Analysis Team assigned "Priority" Occurrence Categories to accidents where NTSB reports provided clarity to the actual cause of the accident. Of the 49 nighttime accidents that occurred during this period; 15 were categorized as Visibility (VIS) or Controlled Flight Into Terrain (CFIT) occurrences which resulted in 10 fatal accidents. Six of them were listed as Inadvertent entry into Instrument Meteorological Conditions (IIMC) as a Sub-occurrence category.

The NTSB reported IMC conditions in 5 accidents (one aircraft was certificated to fly under IFR rules), while only two of the pilots involved in these accidents held instrument ratings. Of the 5 accidents that occurred in IMC, 3 were reported by the NTSB as dark night conditions and all 3 were fatal. Of the 10 that occurred in reported VMC, 6 occurred in dark night conditions and 3 of these accidents were fatal. Two accidents occurred in reported Night conditions, resulting in 1 fatal accident. The NTSB categorized the light conditions for these accidents as 9 dark night (66 percent fatal) and 4 night (50 percent fatal). Dark night conditions are essentially the low lighting condition explained in the AIM section 10-2-2.



Six years of safety data analysis compiled by the USHST shows that more than half of all civil helicopter accidents occurring at night involve pilots with less than 100 hours of night flight experience and up to 78 percent with pilots having less than 500 hours of night experience.

Thirteen of the 15 accidents studied involved aircraft flown for some organization or company, which yields certain questions. Were Standard Operating Procedures (SOPs)/risk analysis tools in place to evaluate and provide go no-go criteria? Furthermore, were any SOP's disregarded? Intuitively, the costs to an organization resulting from an accident are incredibly high.

Embracing the Safety Culture

A hazard can be defined as a condition that could potentially cause damage or harm. Combining an assessment of the severity and the probability of occurrence produces a Hazard Risk Assessment. Using a Flight Risk Assessment Tool (FRAT) can generate similar useful assessments. From the above fatal accident numbers the severity of the hazard can likely be assigned as a catastrophic event. According to the data, the probability of that catastrophic event happening is frequent when night flight and IMC are combined. Safety programs in any industry would require immediate attention and application of mitigations to any events categorized as frequent occurrence with a catastrophic outcome.

It is imperative that some type of formal Risk Assessment process be established for all types of helicopter flight operations before the mission is accepted. Each flight needs to be carefully evaluated, based on a risk assessment tool, and the mitigations determined and applied to bring risk to an acceptable level.

Summary

Evidence is apparent in this night accident research of occurrences classified as Visibility (VIS) or Controlled Flight into Terrain (CFIT) with 2/3rds, of the accidents being fatal to at least one on board; often all perished.

- 66 percent were fatal when light conditions were reported as dark night.
- 50 percent were fatal when light conditions were reported as night
- 100 percent of the accidents that occurred in night IMC were fatal.
- A majority of pilots involved in these accidents had less than 500 hours of night experience.
- In general, night accidents are more deadly than day time accidents.

Intervention Recommendations

1. Organizations need to establish and enforce Risk Assessment procedures and then support those decisions for enhancing safe operations.
2. Beyond the knowledge in the Helicopter Flying Handbook, regulations and IM regarding night flight, the pilot must be paired with knowing and deciding when not to fly.
3. Using a range of mitigation strategies such as no-go decisions, filing IFR, landing at only approved lighted airports/helipads, only using landing sites with published approaches, waiting for VFR weather and/or improved light conditions.
4. Increase the emphasis on decision making process prior to and during flights when night and or potential for IMC conditions are present.
5. Recognition and actions for protection of human life before, during and after flight should be

paramount. Much like how police and other emergency service personnel have an obligation to protect life and welfare, pilots should also acknowledge and accept that responsibility.

6. Consider a policy requiring a night flight authorization added to a pilot's certificate with a currency requirement of more than the CFR required three take-offs and landings within the preceding 90 days.
7. Provide more simulated IFR flight scenarios to expose pilots to the challenges of operating under IMC during critical events.



References

- FAR AIM (ASA pubs) – VFR at night Chapter 10-2-2
USHST Safety Bulletin - "A Flight/Ground Risk Assessment Tool (FRAT/GRAT)"
IHST Training Fact Sheets –
- "Visibility"
 - "Inadvertent Entry Into Instrument Meteorological Conditions. (IIMC)"
 - "Precautionary Landings"
- Reports - "US JHIMDAT Comparative Report Vol1"
EHEST Safety Leaflet - "Principles of Threat and Error Management (TEM) for Helicopter Pilots, Instructors and Training Organizations"
Press Release - 2014 - "Lower Nighttime Flight Hours = Higher Nighttime Helicopter Accidents"

This document is a peer reviewed publication by an expert panel of the USHST. The IHST References and more information about the IHST and USHST, its reports, its safety tools, and presentations can be obtained at its web site: (www.IHST.org) or at (www.USHST.org).

