

SPATIAL DISORIENTATION CAUSING AN ARMY HELICOPTER CRASH: CASE REPORT AND DISCUSSION OF POTENTIAL COUNTERMEASURES

DISORIENTATION SPATIALE CAUSANT UN CRASH D'HÉLICOPTÈRE DE L'ARMÉE: RAPPORT DE CAS ET DISCUSSION DE CONTRÔLES POTENTIELS

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Background: Spatial disorientation is acknowledged to be a frequent cause of helicopter accidents, both in military and civilian flight operations. By analyzing contributing factors in specific accidents, indications for further research and specific countermeasures may be gleaned. This presentation describes such an accident, highlighting some familiar characteristics as well as challenges ahead for aeromedical and safety practitioners.

Case: A US Army UH-60 Black Hawk took off in a flight of two helicopters into foggy night conditions for a training troop insertion mission. The accident aircraft continued after the other aircraft aborted due to poor visibility conditions. The experienced crew became disoriented; attempts to maintain control, including engaging the autopilot, failed and the aircraft subsequently impacted the water with fatal results.

Discussion: As a result of this accident, several countermeasure strategies are being pursued: 1) Education: The hazards of spatial disorientation are stressed to aircrew at every opportunity. 2) Training: A series of disorientation scenarios have been designed for UH-60 simulators to illustrate the circumstances of this accident (and others) and corresponding avoidance techniques; 3) Displays: Research is underway to assess the effects of multisensory cuing (i.e., visual, auditory, tactile) on aircrew workload, situational awareness, and the maintenance of spatial orientation. 4) Technology: While the real-time measurement of aircrew state, to include orientation, is still in the research domain, future aircraft will benefit from adaptive automation systems that sense the aircrew's workload, orientation, and capacity to safely control the aircraft.

Conclusion: The occurrence of accidents like the case reported indicates the continuing need for research into spatial disorientation. Countermeasures may range from simple training techniques to very expensive future enhancements to aircrew cuing and flight control systems. Eliminating this frequent accident cause must remain a top priority.