



Safety and Occupational Health Aspects of Human Systems Integration



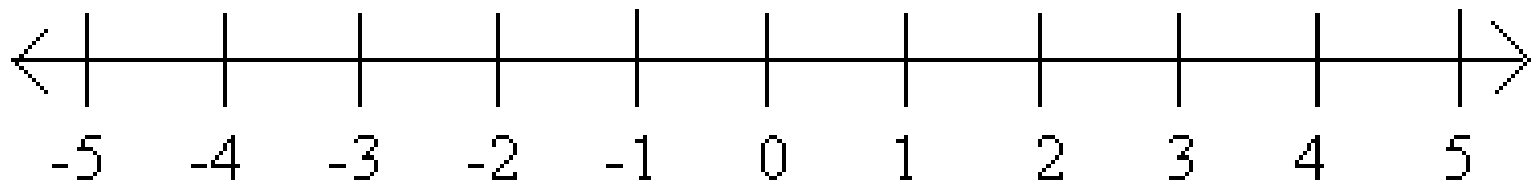
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Safety & Health in Human Systems Integration

- Mission failure
- Mishaps (“safety & occupational health”)
- Death, injury, illness
- Mission success
- Optimal system performance



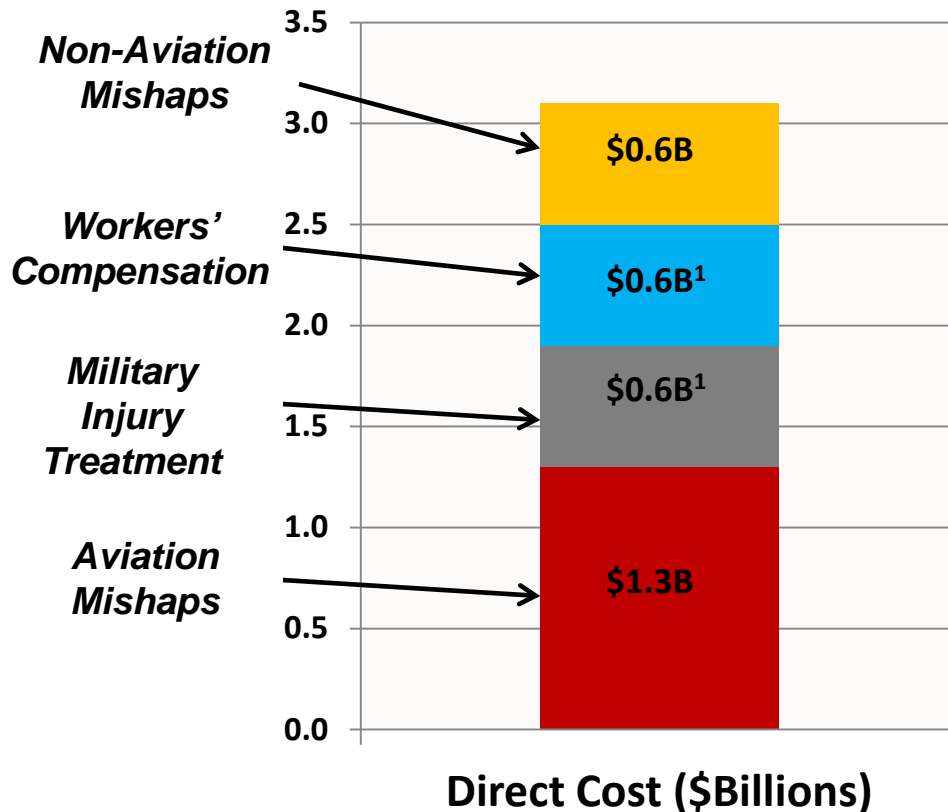
Human Performance



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80% of Mishaps Result from Human Error, Cost DoD Billions, and Reduce Combat Readiness

FY2015: \$3.1 Billion¹



Military Service Safety Center mishap data effective November 30, 2015.

271 Military Fatalities

- PMV: 158 (PMV-2: 66; PMV-4: 74; Ped: 18; Bicycle: 0)
- GVO: 13; GMV: 4; Afloat: 2;
- Aviation: 28; Ground: 62; Weapons: 4

19 Civilian Fatalities

- \$552M in DoD FECA² Costs
- \$202M in DoD FECA² Cost savings compared to Gov-Wide FECA² Cost increases since FY02

776,661 Military Medical Injury Cases³

- 193,319 cases with duty limitations
- 24,922 hospitalization / quarters cases resulting in 65,767 days lost
- Estimated cost of medical treatment = \$0.6B

22 Aircraft Destroyed

- Class A Aviation Accident Rate⁴ at 1.44
- Total Class A Aircraft Losses = \$0.8B

¹Overall DoD Costs include the Military Services and "Other DoD"

²FECA Charge-back year: July 1, 2014-June 30, 2015

Source: Force Risk Reduction (FR2), Defense Civilian Personnel Advisory Service (DCPAS).

³ Military Injury data reported through July 31, 2015

⁴The count of Class A mishaps / the number of flight hours estimated by the Services (per 100,000 flight hours



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Army Aviation Accident Causes

The Dirty Dozen

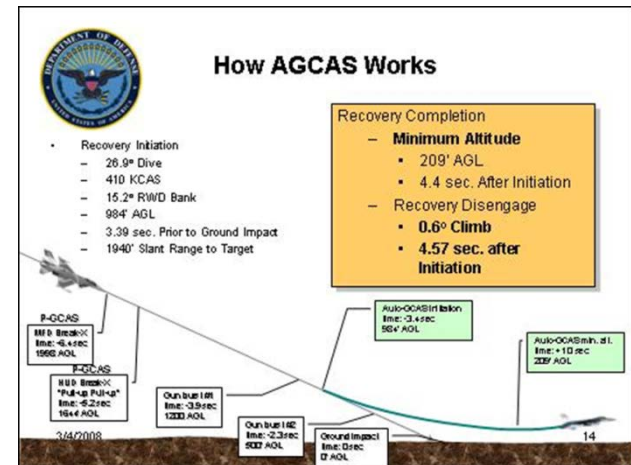
- ✦ Lack of Crew Coordination
- ✦ Complacency
- ✦ Distraction
- ✦ Exceeding Your Limitations/Abilities
- ✦ Indiscipline
- ✦ Fatigue
- ✦ Stress
- ✦ Peer Pressure
- ✦ Lack of Knowledge
- ✦ Lack of Training
- ✦ Lack of Leader Involvement
- ✦ Lack of Pre-mission Planning



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Safety and Health Initiatives in Human Factors

- Controlled Flight Into Terrain (CFIT) was the #1 killer of fighter pilots
- Auto-Ground Collision Avoidance System (AGCAS, software) recovers an aircraft at the last second to prevent ground collision, even if the pilot is incapacitated
- AGCAS saved three F-16 pilots and aircraft in the first year of operational use





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Safety and Health Initiatives in Human Factors

- Helicopter Terrain, Weather, & Traffic awareness devices enhance pilot capabilities
- Provides awareness of:
 - Terrain (Global Data Base)
 - Obstacles (North American & Western European Data Base)
 - Weather
 - Traffic (Interrogates all transponder equipped aircraft)





Safety and Health Initiatives in Human Factors

- Preventing Airborne Ankle Injuries
- Pilot program at Airborne School used commercially developed reinforced ankle brace to stabilize jumper's ankle during Parachute Landing Falls (PLFs) reducing the potential for ankle injury
- Resulted in a 50% injury reduction
- Evaluated over 102,000 jumps and did not cause other injuries or entanglements





Safety and Health Collaboration

- Joint Human Systems Integration Steering Committee
- Acquisition ESOH Integrated Process Team

A Strategic View