

WORK ZONE

REDUCING MISHAPS BY 50%

THE HUMAN FACTORS ANALYSIS AND CLASSIFICATION SYSTEM (HFACS)

By Lt. Laura Mussulman and LCdr. Deborah White

To err is human; to prevent human error makes for a strong safety program. Humans make mistakes, and the military system has developed checks-and-balances to catch human errors before they lead to major mishaps. Unfortunately, when the control measures don't catch the human error, accidents happen. Until recently, no tool was available to enable a CO or mishap board to identify the "holes" in the controls.

The Human Factors Analysis and Classification System (HFACS) was developed in response to a trend that showed some form of human error, at various levels, as a primary causal factor in 80 percent of all flight accidents in the Navy and Marine Corps.

HFACS identifies the human causes of an accident and provides a tool to not only assist in the investigation process, but to target training and prevention efforts.

HFACS looks at four levels of human failure (see figure of "Swiss cheese" model). These levels include unsafe acts (operator error), preconditions for unsafe acts (such as fatigue and inadequate communication), unsafe supervision (such as pairing inexperienced aviators for a difficult mission), and organizational influences (such as lack of flight time because of budget constraints).

Using HFACS to analyze hundreds of aviation-mishap reports, the Naval Safety Center has identified the following human errors as leading contributors to Class A mishaps:

Unsafe Acts of Operators

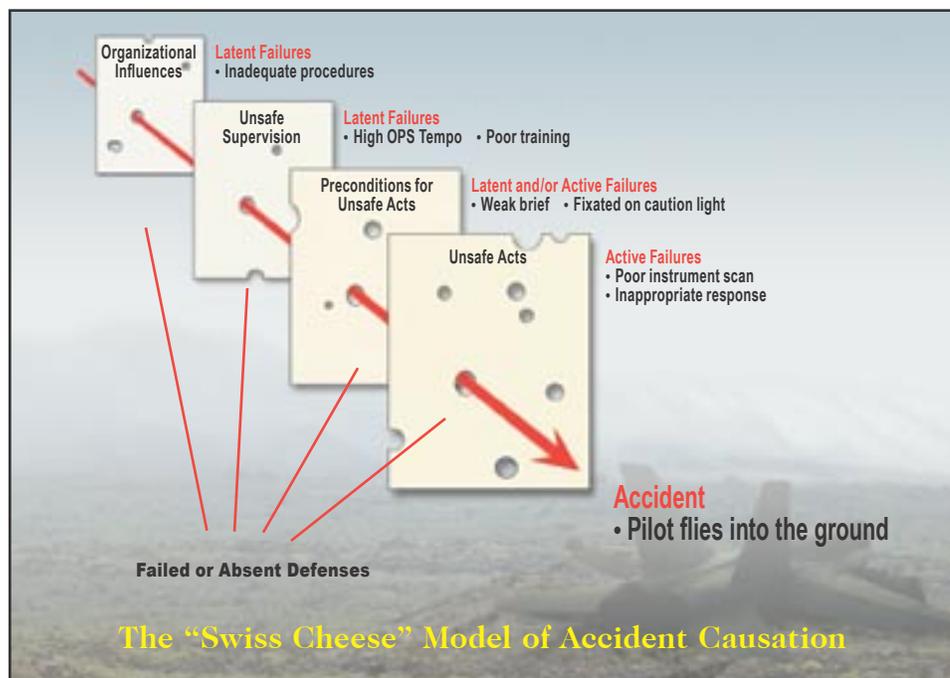
- **Skill-based errors** are "stick-and-rudder" and other basic flight skills that are not performed correctly. These skills require little if no thought on the part of the aircrew and often are susceptible to attention failures.

- Breakdown in visual scan
- Failure to recognize extremis
- Improper use of flight controls

- **Decision errors** are "honest mistakes" that resulted in actions or inactions based on the pilot's lack of knowledge or poor choices.

- Wrong response to emergency
- Poor decision
- improper procedure executed

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Preconditions for Unsafe Acts

- **Adverse mental states** are those mental conditions and attitudes that affect performance.
 - Channelized attention or fixation
 - Loss of situational awareness
 - Inattention or distraction
- **Crew resource management errors** involve poor communication skills or coordination among all personnel involved with the flight or mission, not just the flight crew.
 - Failed to communicate or coordinate
 - Failed to backup
 - Failed to conduct an adequate brief

Unsafe Supervision

- **Inadequate supervision errors** occur when supervision was inappropriate or absent.
 - Failed to provide adequate guidance or oversight
 - Failed to provide adequate training
 - Failed to track quals or performance

Organizational Influences

- **Organizational process errors** result from inadequate or misinterpreted corporate decisions or rules that govern everyday squadron activities (such as SOP, NATOPS).
 - Failure to provide adequate guidance
 - Inadequate documentation
 - Failure to provide adequate or professional procedures.

How does HFACS help decrease the mishap rate?

HFACS is the first step in the risk-management process: Identify the human-factor problems. The next step is to implement interventions at squadron and organizational levels to reduce the number of mishaps, based on the data gathered by HFACS.

For more information on HFACS visit our website: <http://safetycenter.navy.mil/presentations/aviation>. 

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Web Enabled Safety System

Years of research and planning, and tens of thousands of hours of software design and programming. The result: easier reporting, higher quality data, and powerful tools for studying mishaps and identifying trends.

The goal: prevention.



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