



# Human Factors



research and technology division

## Detecting and Correcting Errors on the Flight Deck

### Objective

To identify sources of failures of pilots to detect and correct errors that occur during flight. Based on this understanding, to develop crew training procedures that will increase the likelihood that errors are detected and that effective and appropriate strategies are used to correct the errors.



### Approach

Four questionnaire studies and a full-mission simulation study were conducted to identify error detection and effective communication strategies for calling attention to problems and getting action on them from other crew members who differ in rank, culture, and gender. Cultural differences were found in the extent to which crewmember status was a factor in pilots' responses. All pilots, however, regardless of nationality or gender, relied on one status-consistent strategy to request corrective action. Captains generally preferred commands, while first officers predominantly used hints. However, when U.S. pilots were asked to rate the effectiveness of various strategies, both captains and first officers favored communications that appealed to crew responsibility rather than to a status-based model. The full-mission simulator experiment indicated that pilots in this realistic setting were very sensitive to the social impact of pilot errors. Major, highly embarrassing errors were corrected more indirectly than minor oversights. When risk was high, errors were more likely to be noted and corrective strategies were more direct.

### Impact

The NTSB has identified "monitoring and challenging" errors as a major factor contributing to accidents. These errors occurred in over 75% of crew-involved accidents between 1978 and 1991. By understanding the source of these errors, it should be possible to reduce the accident rate through training designed to support pilots in error detection and correction.

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