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NASA TO STUDY EFFECTS OF "JET LAG" ON PILOT PERFORMANCE

NASA's Ames Research Center, Mountain View, Calif., has begun a project to determine how irregular work schedules and sleep patterns, and frequent crossing of time zones affect airline pilot performance.

Studies in animals and humans have shown that interruption of biological cycles can cause reduced performance, fatigue, loss of attentiveness, short-term memory lapses and decreased alertness.

Scientists say pilots may suffer this "circadian desynchronosis" (sometimes called "jet lag"), which is the disturbance of 24-hour biological rhythms, especially sleep cycles.

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Although research has been conducted on biological rhythms in shift workers, truckers, railroad engineers and ship crews, little research has been done with airline crews.

The Ames Life Sciences study will have four parts: the large body of existing scientific literature on circadian rhythm will be translated into lay terms and disseminated to the aviation community; a field study will be conducted to determine rest, sleep, dietary and drug use patterns of commercial airline crews; current simulation facilities will be used for studies of altered sleep and nutrition patterns; and a new Ames simulation facility, planned for completion in 1983, will be upgraded to provide a laboratory for further investigations.

NASA was asked to study the subject of pilot fatigue by Rep. Barry Goldwater Jr. of the House Committee on Science and Technology.

Three preliminary activities helped NASA design the current project: a workshop held in August; a review of research literature completed in July; and an analysis of safety reports finished in September.

The August workshop was conducted by the Ames research team leaders -- Dr. Joseph C. Sharp, deputy director of Life Sciences; Dr. Alan Chambers, chief of the Man-Vehicle Systems Research Division; and Dr. Charles M. Winget of the Biomedical Research Division.

Airline, research and Federal Aviation Administration personnel who participated in the workshop agreed that there is a pilot fatigue problem, but they could not agree on its magnitude. Research on the subject was strongly recommended.

Meanwhile, a group of life scientists reviewed the scientific literature and prepared an extensive, 600-page bibliography on the disruption of circadian rhythms, and another group analyzed files from the NASA Aviation Safety Reporting System. (Since 1976, this system has provided an anonymous reporting mechanism run by NASA for the FAA.) Although relatively few fatigue-related reports were found, researchers believe more incidents may be the result of fatigue than are recognized by those reporting them.

Ames' current, four-pronged research program was designed to discover how much circadian desynchronosis affects pilots. Project scientists will try to develop ways to avoid, minimize or counteract its effects and to discover tolerance limits, beyond which performance becomes hazardous.

Ames' Human Research Facility has been used primarily to study simulated weightlessness induced by prolonged bedrest. The facility's beds, kitchen and test equipment can be used to study airline crews. As voluntary subjects, crew members' sleep and nutrition patterns could be altered while they are tested for vigilance, eye-hand coordination and other motor skills.

The $8-million Ames Man-Vehicle Systems Research Facility, which consists of two simulated airplane cockpits and an air traffic control simulation, is being built solely for research in human factors in aviation. When completed in 1983, this facility will make an ideal laboratory for full-scale simulation of flight missions with airline crews as volunteer subjects.

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