MAY 2000

Reason for CFIT (The Analytic Sciences Corporation (TASC); Air Force Research Laboratory, Brooks AFB, TX; 8th Fighter Squadron, Holloman AFB, NM): "Several aircraft each year are lost because of an unexplained collision with the ground. The attitude of most of these aircraft prior to impact was nose-low and with excessive bank, i.e., greater than 90°. Prior to these accidents, each aircraft was noted as either changing heading or making an abrupt roll … Six pilots were given a series of three roll rates and two head positions while the aircraft automatically changed bank from 45° of bank in one direction to 45° of bank in the opposite direction. The subject's view of the external visual scene was restricted with a blue-amber vision restricting transparency combination. All attitude-indicating instruments were blanked, requiring the subjects to make stick inputs based on their vestibular (somatosensory) feedback … Subjects experienced a consistent tendency to increase bank angle after given control of the aircraft immediately following the roll maneuver, while thinking they were maintaining a constant bank angle. In some cases, the pilots rolled the aircraft completely inverted … When pilots rely on their perception of bank, following a roll, they will inadvertently increase their bank in the direction of the previous roll."[1]

GLOC symptoms (U.S. Air Force School of Aerospace Medicine, Brooks AFB, TX): "Some 329 military high-performance pilots were anonymously surveyed to determine the occurrence rates for a symptom complex of acceleration-induced neurologic manifestations. The premise for this symptom complex is the theory that acceleration-induced neurologic effects are not always an all-or-none phenomenon with G-LOC as the operational endpoint … A significant number of aircrew in selected types of aircraft reported symptoms such as euphoria, apathy, displacement, depersonalization, poor response to auditory stimuli, immediate memory, difficulties, sensory abnormalities, motor abnormalities, confusion, and dream-like state without loss of consciousness … These findings may signal a need for alterations in G-awareness training."[2]

MAY 1975

Noise exposure (Naval Aerospace Medical Research Laboratory, Pensacola, FL): "This investigation … focused on administering conventional audiometry …, high-frequency audiometry …, and a speech intelligibility test in noise to 108 Naval Aviation Officer Candidates prior to and following primary flight training in T-34 aircraft. Hearing protection consisted of either the APH-6C or APH-6D flight helmet. Cockpit noise levels in the T-34 range from 96-115 dBA; during cruise the noise level is approximately 100 dBA. Results indicate no significant change in hearing sensitivity or speech discrimination that could be attributed to noise exposure during primary flight training … Questionnaire data indicated that a considerable number of the subjects had been exposed to potentially hazardous noise before entry into military service."[3]

Laser threats (U.S. Army Environmental Hygiene Agency, Aberdeen Proving Ground, MD; U.S. Navy Industrial Environmental Health Center, Cincinnati, OH): "The use of lasers in tactical military aircraft present eye hazards to personnel in aircraft and on the ground. Biomedical scientists and engineers are often asked for advice for controlling these hazards. Methods are given for applying ocular exposure criteria to the solution of practical field safety problems. Laser pointing accuracy and the extent of hazardous specular reflections from flat glass and from standing areas of water are the principal determinations required to develop safe laser operations. Special considerations may be required for scanning lasers and laser arrays."[4]

MAY 1950

Commercial aircraft decompression (London, UK): "Although the possibility of sudden decompression occurring in properly constructed pressurized aircraft is very remote, it is wise to take adequate precautions during the pioneer stage. It is necessary, therefore, to consider the physiological implications of such a catastrophe and how these could and should be met practically, if not ideally …

"The physiological stresses which would follow explosive decompression in the cabins of pressurized aircraft operating at altitudes of 35,000 to 40,000 feet would be severe and lead to fatalities within a few minutes, unless oxygen were immediately available or a descent could be made to 14,000 feet in four to five minutes. The time of survival at rest would be in direct ratio to the physical fitness of the individual. The main stress would be lack of oxygen; other stresses would be distension of stomach and intestines, cold effects, and formation of gas bubbles in the tissues and blood causing 'bends' …

"All members of aircrew, including stewards and stewardesses, should, during their training, be exposed to explosive decompression in a low pressure chamber and instructed how to look after themselves and their charges in such an emergency. If they are not personally decompressed, they should witness the event."[5]

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This column is prepared each month by Walter Dalitsch III, M.D., M.P.H. Most of the articles mentioned here were printed over the years in the official journal of the Aerospace Medical Association. These and other articles are available for download through the link found on https://www.asma.org/journal/read-the-journal.

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