

**NOVEMBER 1991**

*Defining situational awareness (USAF School of Aerospace Medicine, Brooks AFB, TX and Human Performance Research Associates, San Antonio, TX):* "Superior situational awareness, an extraordinary awareness of the total flight environment and aerial combat situation, is a significant contributor to success in aerial engagement... Superior awareness involves exceptional sensitivity to performance-critical cues in the operational environment, an exceptional capacity to anticipate changes in system states and operational conditions, and the ability to act on those changes in a proactive mode. Three important constructs are described: 1) automatic information processing; 2) near-threshold processing; and 3) skilled memory. In combination, they constitute a pilot attribute which uniquely facilitates the full armamentarium of skills and abilities of the superior tactical pilot"<sup>2</sup>

*Pilot incapacitation (RAF Institute of Aviation Medicine, Farnborough, UK):* "29% of the 4,345 respondents had been incapacitated at least once. [G]astro-intestinal symptoms accounted for the majority (58%) of incidents, other main causes being symptoms of nasal and sinus congestion ('blocked' ear and sinus pain), headaches, and faintness or general weakness. Of those who had experienced an incident of incapacitation, 48% claimed that safety was actually, or potentially, affected. However, when all respondents were asked whether they were concerned about safety in the event of incapacitation inflight (excluding take-off and landing), only 25% expressed concern..."

"It would appear... that the aetiology of incapacitation has changed very little in 21 years [compared to a similar 1967 survey]. Advancements in training may have led to an improvement, or at least a perceived improvement, in safety but there is no evidence to suggest that the incidence of incapacitation per se has declined"<sup>3</sup>

**NOVEMBER 1966**

*Isolated space environment analogues (Institute of Behavioral Research, Texas Christian University, Fort Worth, TX via NASA grant):* "The conditions of isolation, confinement, and other stresses to which extended duration space crews will be exposed are unprecedented and many of the problems are not yet understood. Hypotheses directed toward principles to optimize crew organization and adaptation must be generated from present knowledge. Extrapolations might be attempted from various literature sources of human experience in extreme situations. However, the appropriateness of such generalization depends on the system similarity of the various situational contexts to that of the spaceship. A model social system for such micro-societies was constructed and system profiles of eleven well known system patterns were compared with that postulated for the extended duration spaceship. Greatest similarity was found for submarines, exploration parties, naval ships and bomber crews, and least for shipwrecks and disasters, industrial work groups, and prison groups"<sup>4</sup>

**NOVEMBER 1941**

*Developing aviation medicine (U.S. Navy):* "The dominant importance of the use of aircraft in the present war has led inevitably to

specialization in types of aircraft and operation performance. This has served to accentuate medical research as a means of meeting new and extended demands placed upon the pilot..."

"Outstanding in this regard has been the need for further improvement in oxygen supply equipment. Operations at extreme altitudes beyond 25 or 30,000 feet, must be regarded as an additional hazard beyond anything encountered at lower altitudes, and requires for its safety, special equipment and administrative measures for the selection and indoctrination of personnel performing such flights..."

"A satisfactory solution of the adverse effects of gravity stress encountered in dive bombing and other aerial maneuvers has not been attained. While postural measures serve to relieve the situation somewhat, these measures alone are inadequate. Control measures by use of pneumatic belts and pressure to the splanchnic area are attended by complicating factors which still require further consideration..."

"Night operations have stressed the importance of good night vision and have resulted in extensive research with regard to this subject... [T]he vitamin theory in this regard is subject to drastic revision downward, except of course in those cases showing evidence of vitamin A deficiency..."

"[T]he question of fatigue and stress among pilots is a matter requiring careful and thorough consideration. Naturally these conditions are accentuated among pilots actually participating in a war... The aerial patrol entails long flights under trying conditions at sea. Carrier operations are even more exacting..."

"Specialization in military flying is here... This means classification of flying personnel for special duties such as bomber pilots and fighter pilots. What shall be the criteria upon which to designate one youngster for pursuit flying and another for bomber duty? ...

"I wish to stress the importance of the well trained flight surgeon in the present aeronautical program. Particularly that individual with exceeding common sense and good personality. We are developing more and more around those individuals and not away from them in our modern aviation"<sup>1</sup>

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