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A Psychopolitical Analysis of Situation Awareness: An Editorial

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Title: A Psychopolitical Analysis of Situation Awareness: An Editorial

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One of the psychological certainties of aviation-related terrorism is that a few successful terrorist operations can reinforce perceptions in many people that success is frequent and that the threat is all-pervading. However, even a cursory glance at statistics generated by the National Safety Transportation Board, the Federal Aviation Agency, and the Federal Bureau of Investigation suggests that in an era in which terrorism is often a "first reaction" to aviation tragedy, most aviation mishaps are due to human factors: terrorism being only a small subset whether in the cockpit during flight; on the ground during maintenance; within a terminal during security checks and passenger, luggage, and cargo processing; in the office during policy and program deliberations; or even earlier during design or manufacture.

A useful concept embracing most human factors related to aviation safety is situation awareness. Situation awareness denotes knowing one's exact position and anticipating events in order to stay in the know. This concept may literally apply to one's location in space and absolute time, or figuratively to one's position in a sequence of actions or the flow of events. Thus, it applies to all aviation-related personnel, operational and support.

Situation awareness is a uniquely psychopolitical concept. Knowing where one is but being where one is not supposed to be may trigger an international incident. According to Cuban aviation authorities, an example has been the violation of Cuban airspace by Cuban-American pilots. An international incident also may be triggered by not knowing where one is and being where one is not supposed to be. According to some U.S. authorities, an example has been the violation of Soviet airspace by at least one Korean airliner.

On the other hand, being where one is supposed to be and not knowing where one is may reinforce one's belief in Fate, God, Luck, or belief in the effectiveness of the inappropriate procedures which got one there. Here one can--after the fact--become a political force to maintain procedures within one's organization which do not contribute to situational awareness.

Finally, being where one is supposed to be and knowing where one is is supposed to be business as usual. Holding the feet of aviators to the fire, however, one might elicit a very different kind of business, which might or might not be usual. The politics of admitting to not having been situationally aware may be unusual enough to cloud the issue of what business as usual really is.

All this is predicated on an aviator being able and willing to even know whether one knows where one is or not, let alone where one is supposed to be. If not, anecdotal self-reports, interrogations, and debriefings that often comprise data influencing research, policy, program, and procedural agendas--and funding--will surely be suspect. This last is an example of the politics of experience.

But situation awareness is psychopolitical in other ways as well. Research on situation awareness often reflects agendas of researchers and funding sources. These agendas may be less than completely correlated with knowing where one is and anticipating events--the one being the aviator. However, these agendas may be correlated to varying degrees with knowing where one is, if the one refers to the

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researchers or funding agencies and the where is some location on a hierarchy of attractiveness as a researcher or a funding agency, or the distance between that location and where one wants to be.

Textbooks often list the following as correlates to situation awareness: (1) the physical layout, viz., placement, color, size, resistance to force, of apparatus; (2) procedures inculcated through training to use the above apparatus; (3) procedures inculcated through training to anticipate events; (4) biological processes including central and peripheral nervous system functioning; (5) psychological processes such as cognitive functioning-- e.g., attention, memory, and learning--stress level, stress tolerance and management, and group dynamics; (6) environmental phenomena, e.g., ambient temperature, radiation, and baseline toxicities.

But there are other human factors which often meet significant political resistance if they are listed as significant correlates of situation awareness and, therefore, aviation mishap, especially in specific cases. (There's much less resistance to discussing these factors in the abstract.) More often than not, perhaps because of the politics of research, they may only be fleetingly inferred from psychological autopsies, after-action reports, and debriefings.

One factor is chronic alcohol use which is often discounted if there is a zero blood-alcohol level in those tested at a time proximal to the mishap. (People who have been alcohol dependent but "dry" for years may well exhibit chronic cognitive dysfunction.) Contributors to resisting this factor include the (a) legality and acceptability of the social usage of alcohol, (b) obligatory attacks on a company's human resources management program if chronic alcohol use was causally identified, and (c) inadequate knowledge of the cumulative effects of alcohol use by aviation decisionmakers.

A second factor meeting resistance is a complex of attitudes, values, life motivations, sociometric status, quality of personal relationships, and personality styles. Resistance here often stems from a distaste for delving into the "personal sphere" and from correct knowledge here misapplied that, in certain self-selected activities--e.g., astronaut duties during the Mercury program--this psychological complex does not have significant predictive validity.

A third factor is a complex of sexual issues which include comfort with one's gender identity and sexual orientation, the degree to which one is driven by sexual desires, and a self-assessment whether one's interpersonal sexual activities are satisfactory. Personal resistance on the part of many people to even discuss such issues induces significant political resistance to labeling this complex as professionally relevant.

A fourth factor is the quality of leadership and management of one's organization, as well as its financial status. Resistance here stems from distaste for self-blame, dissociation from what at other times is a set of appropriate ethical and moral standards, and the concern to protect proprietary interests.

A fifth and final human factor is a complex of political issues, including national security issues at one extreme to the mundane but significant hassles of overflight and landing rights. Resistance here seems to involve a part conscious, part unconscious sense of entitlement to place other competing interests above the quest for safety. Perhaps, at times, this resistance is legitimate.

Aerospace corporations need to continually evaluate their human resource management systems and the situation awareness of their personnel through monitoring all the above. (In this regard, the latest cycle of the United States Air Force's focus on integrity, accountability, and personal behavior should be

applauded--if its criterion is the quest for optimal performance, not the satisfaction of religious and personal predilections of those in power.)

In conclusion, situation awareness is a useful concept embracing most human factors in the broadest sense. It comprises all factors--whatever and wherever they may be--which affect knowing where one is and anticipating events to stay in the know. Its optimization will further aviation safety and security. We need to follow this approach, even if it takes us where none of us have ever gone before. Unfortunately, the same analysis can be exploited by terrorists and other criminals to identify vulnerabilities in order to achieve political objectives through unacceptable means. (See Jones, D.G., & Endsley, M. R. (1996.) Sources of situation awareness errors in aviation. *Aviation, Space, and Environmental Medicine*, 67, 507-512; Endsley, M. R. (1995.) Toward a theory of situation awareness in dynamic systems. Special issue: Situation awareness. *Human Factors*, 37, 32-64.) (Keywords: Situation awareness, human factors.)

***A future issue of IBPP will analyze hypnotic susceptibility and dissociation as psychological phenomena with impact on aviation safety and security, and relevant antiterrorism and counterterrorism programs. (See Butler, L. D., et al, (1996.) Hypnotizability and traumatic experience: A diathesis-stress model of dissociative symptomatology. *American Journal of Psychiatry*, 153, 42-63; Beere, D. (1995.) Loss of background: A perceptual theory of dissociation. *Dissociation: Progress in the Dissociative Disorders*, 8, 165-174.)