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Coping with High-tech Cockpit Complacency

The highly automated electronic systems of modern aircraft can lull the unwary pilot into a false sense of security.

by
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Complacency is caused by an overabundance of the very things that should be expected to prevent accidents — experience, training and knowledge. "Familiarity breeds contempt," applies to those who become so comfortable with cockpit routines that their sense of alertness is dulled. By utilizing the team concept of cockpit resource management (CRM), the involvement of all flight crew members in decision making can contribute to recognition of and coping with complacency, especially in today's high-tech cockpit environment which is aimed at reducing pilot workload.

Reliable, computerized automated systems are assuming more of the operational and monitoring details of today's high-tech aircraft. The crew members operating this equipment must recognize that the advanced technology that is easing their workload as a step toward improved efficiency and safety can, ironically, create problems by reducing their attention and contribute to complacency.

Among the other technological advances of today's high-tech cockpits, crew comfort has not been overlooked. For example, seemingly insignificant details, such as slightly wider and more comfortable flight crew seats, have evolved, too. Obviously, such comfort features in the relative quiet of a jet cockpit provide a more favorable setting for complacency to develop than the noisy, uncomfortable cockpit configurations of years past.

More senior pilots can compare the significant contrasts of operating earlier equipment with that of today. For example, the late Capt. Dick Merrill, the 45,000-hour pioneering pilot of Eastern Air Lines, emphasized the vast contrast in the comfort of flying transatlantic in a Boeing 747 compared to his first crossing in a noisy, poorly instrumented single-engine Vultee that was stuffed with Ping-Pong balls for emergency flotation in case of ditching. In another example, Merrill almost froze to death flying night mail during winter in an open-cockpit biplane.

Favorable conditions prevail for complacency to more easily develop in the high-tech cockpits of today than in previous generations of aircraft. Although the cockpit technology presently in use may appear to be revolutionary, its progress has been evolutionary; advancements have occurred gradually with each upgrade and new generation of aircraft.

Today's transport aircraft has many automated systems to manage flight with precise navigational control and significant advances in the display of cockpit information. With increasing automation, the flight engineer's position is gradually being eliminated as technology allows the two-man cockpit to become the norm.

Although technology represents substantial positive achievement in transport aircraft, a number of safety concerns have been created. Among these are: training procedures; real-life workload under normal, abnormal and emergency conditions; the loss or gain of situational awareness in the new glass cockpit; safety and efficiency with a two-pilot crew; and, the operational consequences of fatigue, boredom and complacency that might be caused by these sophisticated aircraft.

… it is often the overlooked, seemingly insignificant details that can be compounded into major problems.

The complacency factor may appear to be elementary to the highly skilled professionals operating today's complex aircraft; however, a comprehensive review of U.S. National Transportation Safety Board (NTSB) accident reports attributing the probable cause to pilot error suggests that an element of complacency could have been a factor in many of these occurrences.

Complacency Defined

Complacency is defined as being pleased with oneself, as experiencing self-satisfaction and contentment. A sense of being untroubled, undisturbed, unworried, unvexed, unplagued and untormented may leave a lot of time in flight for the mind to wander beyond the stable flight environment of the smooth-functioning, high-tech cockpit. The highly automated aircraft has many systems that practically eliminate the need for pilot involvement, thereby providing additional time for daydreaming or other non-cockpit-related distractions.

Aeromedical specialists have called attention to many aspects of the cockpit environment that lead to fatigue and distraction, but very little emphasis has been placed on conditions that can be conducive to complacency, especially in high-tech cockpits.

Most experienced pilots can recall errors that could have been attributed to complacency. Often the shock of recognition that a mistake has occurred will not be evident until an embarrassing situation happens — such as not properly correcting for a crosswind landing, missing a key item on the checklist or not flying the correct approach procedure pattern.

Complacency can cause crews to run quickly through checklists, fail to closely monitor instruments or to not utilize all navigational aids. It can cause a crew to use shortcuts and poor judgment, and to resort to other incorrect practices that mean the difference between hazardous and professional performance.

If the flight crew member's mind is occupied by thoughts other than control of his own aircraft and avoidance of other ones, there is an excellent potential for deviation from accepted safe operating procedures unless the complacency is recognized and corrected.

Cockpit complacency is not an item that would be specifically listed as a factor in an accident, although it may be a contributing cause. Usually, an accident involves many factors. When pilot error is listed as the probable cause, there is usually a comprehensive tabulation of other conditions and factors that are also investigated for possible involvement.

Actually, complacency can be a rather enjoyable state of mind if the accompanying self-satisfied thoughts are practiced while hiking, fishing, sailing, relaxing in a hammock or doing other non-critical tasks. However, while operating an aircraft, a crew member should recognize and avoid this natural tendency to lapse into a period of inattention.

There have been conflicting opinions concerning the specific duties and authority of individual flight crew members since the first aircraft requiring more than one pilot was placed into service. In the interest of safety, military flight services and commercial airlines have standardized many operating procedures. For example, the call-out and response procedure for each checklist item and the establishment of which crew member does what during specific events, such as emergencies, are now accepted practices.

Crew Mix Affects Complacency

A thought-provoking flight safety position pertaining to the specific duties of a senior and junior pilot was presented at a Flight Safety Foundation meeting several years ago. The director of flight operations for an airline told the audience that his company considered the ultimate in

safety was achieved when a senior pilot was in the right seat supervising a younger and less experienced pilot who was flying the aircraft, especially during the landing approach. The reasoning was that the younger pilot possessed faster reflexes while the senior pilot overseeing his performance had the experience and judgment necessary to better assess the overall operation. Cockpit complacency would be less likely to develop in this configuration.

There has been speculation that using two senior captains might result in a situation which could induce cockpit complacency because their mutual respect and familiarity might result in bypassing checklists and procedures. The pairing of two senior captains may have been a rare occurrence during the earlier days of airline operations; however, in more recent years the level of training and proficiency of the copilot or second officer has been greatly upgraded. For all practical purposes, today's transport copilot could be classed as a reserve captain because of his high level of skill compared with his counterpart of a few decades ago.

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Some four decades ago, the airlines, as well as corporate operators, sometimes utilized inexperienced copilots in the right seat positions to serve an apprenticeship that consisted of on-the-job training. In many cases, this concept left little opportunity for complacency to develop because the captain had to be continually alert to ensure that his copilot did not pull the incorrect lever at the wrong time. Staying alert was prerequisite to staying alive.

Flying the same aircraft every day, with the same crew and utilizing the same routes, more common to corporate operations than airlines, can lead to complacency. Each pilot learns precisely how his associate reacts, especially in a two-pilot flight operation. This familiarity also develops a tendency to implement shortcuts, such as accomplishing an abbreviated checklist without using callouts, and overlooking accepted procedures, such as not using an approach chart at a "familiar" field even though certain critical information could be overlooked.

Expect the Unexpected

Flying has been described as "hour after hour of boredom, punctuated by moments of sheer, stark terror." In recent years, the ending threat of this familiar axiom has been almost eliminated by today's reliable, high-performance aircraft. But, just as there are exceptions with mathematical probabilities, on July 19, 1989, this axiom proved true for Capt. Alfred C. Haynes of United Airlines when his McDonnell Douglas DC-10 lost all flight controls while cruising at FL 370.

The aircraft suffered a catastrophic engine failure, and the uncontained disintegration of the tail-mounted engine's fan rotor caused the loss of all three of the aircraft's redundant hydraulic flight control systems, making the aircraft almost uncontrollable. In coping with the one-in-a-billion loss of flight controls the captain, assisted by his crew and another DC-10 instructor pilot who was aboard as a passenger, spent 45 minutes fighting and nursing their crippled transport to the municipal airport at Sioux City, Iowa, U.S., where they maneuvered the aircraft to a semi-controlled crash. Their only control was using varying combinations of engines and power.

This accident has been precisely recounted by Haynes and documented in several publications (FSF *Accident Prevention*, June 1991). Pilots reading the complete details of this report will learn a few lessons.

Haynes recounted that there were five very important factors that contributed to the degree of success they experienced. These were luck, communications, preparation, execution and cooperation. Good luck was the most important, since "we were left with a chance to survive."

CRM Prevents Cockpit Complacency

In recounting the DC-10 accident, Haynes related an important factor relevant to the event. He praised the company-sponsored CRM program that was introduced in 1980 and utilized the talents and knowledge of all members of the crew. During the hectic 45 minutes they spent controlling the crippled transport, the high level of cooperation on the part of the cockpit crew members was attributed by the captain to their earlier CRM training.

Until recent years, the industry had never placed emphasis on training crew members in cockpit management. The progression from right seat to left seat, or from flight engineer to copilot, traditionally occurred when enough time, seniority, experience and technical skills were accumulated. After worldwide accident reports indicated many probable causes of fatal accidents involved lack of cockpit coordination, the CRM training program was implemented by the industry with the object of improving the situation.

CRM might be compared to changing cockpit crew authority from a dictatorship led by the captain, to a more democratic process, with each crew member contributing

knowledgeable input. This results in a more cooperative venture in the safe operation of the aircraft. Another advantage of this cooperative crew concept might be utilized in preventing a fellow crew member from being lulled into a state of complacency. A casual conversation suggesting a cup of coffee or even taking a stretch could be the answer when one crew member notices the signs of complacency in another.

Complacency is not a factor during proficiency flight checks or when performing emergency procedures under actual conditions. If crew members always operated with the same alertness and utilized an informal self-analysis of their performance as they do during such conditions, complacency would not be a contributing cause to an accident.

Man/Machine Relationship — A Challenge to Complacency

Today's modern, high-tech aircraft and well-trained crew is an excellent example of a remarkable man/machine relationship. Although the machine function of this relationship seems to be making the most scientific progress by reducing man's workload, it is the thought process of man that developed the technology and directs its safe operation. Certainly, complacency should not be allowed to alter this relationship. ♦

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