



Subtle Incapacitation Of Pilots: How To Tell If Your Captain Has Died

Subtle incapacitation of pilots caused by obscure factors that escape the normal pilot medical screening and proficiency qualification process is a genuine concern in the industry. Although incidents are few, pilots must be trained to deal with such performance breakdowns.

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by

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Incapacitation of pilots in commercial air travel is a significant concern of the traveling public. Several movies and novels have addressed this issue, sometimes with fictionally heroic resolutions.

Journalist Alexander Woolcott said, when he was informed that his political nemesis, Calvin Coolidge had passed away, "Oh really? How could they tell?" The subtitle of this paper surfaced over ten years ago when training programs on pilot incapacitation for airline crews first came into existence. Many senior airline copilots felt that all senior captains were permanently incapacitated by the effects of seniority or senility. Decades before it became popular to talk about copilot assertiveness in cockpit resource management training, it was acknowledged in the industry that the superlative operational safety record of the major airlines was significantly enhanced by the alert high-performance of its copilots.

Copilots at one major airline even had an informal, secret organization called the "Green Eagles." Below is the "Code of Ethics" used by this sacrilegious organization.

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Green Eagle Code Of Ethics

MOTTO: Respect and honor all pilots behind you in seniority.

- Don't sleep while the Captain is.
- Encourage your Captain to smoke but not in the cockpit.
- Don't interfere if your Captain absolutely insists on making a fool of himself.
- Don't make better landings than your Captain until the last trip of the month.
- It's hell to fly with a nervous Captain, especially if you're the one making him nervous!
- Buy your Captain a surfboard.
- Speak very, very softly when you speak to your Captain.
- Talk up the advantages of early retirement.
- Buy your Captain a power tool.
- The Captain may not always be right but he is always the Captain.
- Buy your Captain some lessons in downhill ski racing.

The two basic rules of a Captain's authority.

Rule 1. The Captain is always right.

Rule 2. When the Captain is wrong, refer to rule 1.

- The most difficult adjustment a new Captain has to make is getting accustomed to being right all of the time.
- It's better to be down here, arguing about how you are going to do it up there; than be up there arguing.
- Always let your Captain be first off the airplane. After all, there may not be any stairs.

On allegiance to the Captain:

- Keep the Captain out of the morgue.
- Keep the Captain out of jail.
- Keep the Captain out of FAA hearings.
- Keep the Captain out of the Chief Pilot's office.

* * *

Subtle pilot incapacitation is much more critical when considering the performance degradation of the captain, as opposed to the other crew members. Most captains are constantly monitoring the effectiveness of subordinate crew members for any signs of substandard or inappropriate performance. It has only been in the last decade that formal training programs have been introduced to alert subordinate crew members to recognize performance degradation on the part of the captain. The operational, safety, effectiveness, and legal responsibility issues are intertwined in such a way to make this a very complex problem. One of the most thorough discussions of this issue of degraded performance on the part of the commander is contained in "*The Caine Mutiny*." Everyone concerned with pilot incapacitation will want to re-read the cocktail party soliloquy given by the defense attorney at the conclusion of the Caine mutiny trial.

Subordinate crew members in aviation may find themselves involved in a sequential decision and action process that is professionally threatening. Very detailed procedures need to be provided and supported to keep subordinate crew members out of a "no-win" situation. The crew members need very explicit guidelines and learning opportunities to accomplish the following process.

Scenario for an Uneventful Incapacitation

1. *Detection*: Awareness of performance anomalies.
2. *Perception*: Description and definition of anomalies.
3. *Analysis*: Assessment of the threat of these performance anomalies.
4. *Strategy Selection*: Identification of the hierar-

chy of intervention strategies to remove or minimize the effects of the anomalies.

5. *Implementation*: Initiation of the intervention process.

6. *Final Action*: Assumption of command and control of the aircraft.

If upper management of an airline doesn't vigorously promote and support the active participation of subordinate crew members in the minimization of anomalous performance, the threat of reprisal from immediate supervisors will stifle the performance of lower ranking crew members. A good example of top level support is contained in the following paragraph outlining the responsibility of the first officer or copilot. (AAL, 1983)

"I. First Officer Responsibility. The pilot occupying the First Officer position is charged with the responsibility of informing the Captain immediately and at any time, should he believe the aircraft is being handled improperly or placed in jeopardy. The Captain may choose to disregard this counsel, such is his command privilege, but no matter to what degree or how often such advice may be disregarded or ignored, the pilot occupying the First Officer's position will nevertheless be held responsible for always offering such advice."

This paragraph has been in American's flight procedures for more than 25 years, long before copilot assertiveness was a buzz word in aviation safety. This paragraph protects the first officer from official, corporate reprisal initiated by the captain. The paragraph also denies the captain the authority to order the first officer to stop offering advice. Without this type of corporate support, copilots will not continue to offer advice to the captain.

It is rare that a significant performance degradation occurs because of subtle pilot incapacitation. This certainly contributes to the excellent safety of airlines. Commercial aviation has many redundancies and high margins of safety built into it; it is also very tolerant and robust to most errors. It is only on those extremely rare occasions when the captain subtly and slowly becomes ineffective or even counter-productive that the subordinate crew members are called upon to cope with a serious situation. In these situations, the copilots must implement a well-defined and well-rehearsed scenario.

Detection

Acute incapacitation usually manifests itself through obvious physical symptoms — illness, nausea, unconsciousness, and pain. The more common and obvious symptoms trigger a change in the operating environment due to the obvious or total incapacitation of a crew member. It is

much more difficult to detect a slow degradation of performance in a crew member, particularly the captain. Such factors as sleep-loss, fatigue, personal and emotional stress, blood chemistry imbalances, side effects of medications, drugs, alcohol, and the rare dysfunctional personality are some of the more probable causes. Bennett (1987) has pointed out that there have been over two million jet hours since the last accident in which pilot physical incapacitation was a contributing factor. This author, along with Bennett, applauds the pioneering efforts in United Airlines by Capt. Harry Orlady and Drs. Kidera, Harper, and Cullen. Their training programs support the thesis that a pilot's most critical task is to correct mistakes; first his own, then those of his fellow crew members, and then those of the support personnel behind the airborne operations. It is because of the thousands of hours of boredom and the benign result of hundreds of errors that the question of subtle pilot incapacitation is a difficult one to resolve.

Risk Assessment

The infrequent performance breakdown that can occur is best detected by having a performance standard on which fellow crew members can assess the individual behaviors. The conduct of detailed briefings immediately before each critical mission phase, particularly takeoff, approach, landing, and go-around, can provide a standard against which a crew member can judge his colleague's performance. If the performance deviates significantly from the prebriefed norm, the steps in the above-mentioned process can be initiated.

The performance breakdown can occur at three levels: the input level; the diagnosis or decision level; and the output or action level. Mistakes at the input level can be signals missed or signals misinterpreted. These errors can occur because of deficient knowledge, skills, attitude, and systems, or from obstacles that detract from rational performance. The errors at the diagnostic and output levels can occur because of any of these factors.

A process flow chart to analyze and reduce pilot errors has been effectively applied to dozens of accidents (Besco, 1988). This process has served as a descriptive, diagnostic, and prognostic model in all types of accidents; from military flights, to commercial airlines, to general aviation aircraft.

Under-Recognized Risks

One form of subtle incapacitation that is under-recognized is incapacitation due to drug abuse — both prescription medications and street drugs. At least three recent accidents have had evidence of one or both of these kinds of drug abuse. It has been assumed in the past that this was an insignificant risk in aviation, but

three events in three years would indicate that the problems warrant some further analysis. Several factors might be in operation. In the United States, one factor is a belief, on the part of some practitioners in the aviation medical examiner community, that the U.S. Federal Aviation Administration (FAA) medical and drug restrictions are very conservative. Therefore, they can be "bent" without any negative results. Another factor is found to be in the generation gap. Young people consider the "establishment's" attitudes, policies, and legal requirements against drugs to be based on emotional "over-response" that have no basis in medical performance facts. We need to implement new safety, performance, and protection measures to insure that all counter-productive attitudes are reversed and their effects corrected.

Strategies

The subordinate crew member needs a well-rehearsed hierarchy of strategies to use when there is an indication of upper-level performance breakdown in airline cockpits. We cannot expect creative ad-libbing to be productive. Errors must be anticipated and the steps to mitigate these errors must be well rehearsed. Each step in the sequence of strategies must reduce the risk and increase the probability of an uneventful resolution of the performance degradation. These intervention hierarchies are crucial to defusing the potential open hostilities that may erupt when the captain may not acknowledge a performance decrement. The organizational policies must support a hierarchy of intervention that is effective and accepted by all levels of crew members. The two-person cockpit has caused an even greater need for well-defined hierarchies. In the three-person cockpit, a confirmation system can be used similar to the systems used in auto-land flight control systems. In the two-place cockpit, the operational procedures must resolve these intervention issues.

Takeover

The subordinate's takeover of control of an airplane has more immediate and serious ramifications than in any other complex systems environment. The cockpit of an airplane is no place to physically wrestle over the controls. The etiquette or hierarchy must be clear-cut as to when the copilot either takes over the controls from the captain, or the copilot who is already flying chooses a strategy not initiated by the captain.

When the captain decides to replace the copilot on the controls of the airplane, the time honored "I've got it" by the captain is readily acknowledged by everyone. Unfortunately, there is no universally accepted procedure for the copilot to use in taking over from the captain. What a copilot needs is the commercial aviation equivalent of a universally accepted communication evident in the life

or death teamwork of fighter pilots. When a lead fighter pilot hears the words "Lead, Break Hard Right" there is no doubt as to its meaning. There is no question as to the immediate need to take the suggested action. The lead receiving this message will give no thought to group dynamics, assertiveness, personalities or the need for more information to reassess the situation. To develop such a universally accepted strategy or procedure for copilots is a vital requirement for the entire aviation community.

Summary

Because incidents of high-performance demands are few, performance breakdowns caused by subtle pilot performance degradation have been infrequent. Recent changes have been implemented to train pilots to recognize these problems. Certain causes of these problems have been under recognized and need to be emphasized. The responsibilities of all professionals in aviation to detect and correct subtle pilot performance incapacitation and degradation are essential to the maintenance and improvement of the excellent safety and performance record in commercial aviation. ♦

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