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Flight Comment

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Canada

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As I See It

Flight Safety is in the business of maintaining operational capability through the use of risk management — ultimately it is a people orientated process.

Standards, orders, and SOPs represent the level of risk considered acceptable and practical for the full spectrum of CF activities — from peacetime to wartime operations. It is understood that commanders in a high intensity wartime action are likely to accept higher levels of risk that those considered acceptable while training in peacetime. Risk management in the planning and execution of operations and training is fundamental to mission accomplishment.

Real and accurate causes and trends must be determined, and passed through the chain of command to support risk management decision-makers. What are the risks? Where are they located? Statistics point towards human and organizational weaknesses as being prime links in the causal chains of most accidents. This truly makes flight safety a people orientated business.

The majority of the identified cause factors of incidents and accidents are either personnel or materiel in nature. Statistics show that nearly 85% of our air accidents are caused by human and organizational factors. This percentage is generally reflected throughout aviation operations in the western world. Our current system works well at detecting and reporting material factors and human factors in ground incidents. However, we find that of the approximately 1600 air incidents reported in a year, only 35% are ascribed to human factors. One could suggest that human factors should be present in 85% of reported air incidents — as they are for the air accidents that we have investigated. Regrettably, I must report that I have yet to receive a hazard or incident report dealing with, the local procurement of sub-standard ALSE, inadequate training programmes, limitations of supervision, the ambiguity or absence of guidance, etc.

The principle of dealing with dangers at the incident stage before they turn into accidents is working in our investigation of material related mishaps. We are not doing as well in detecting human related hazards before they develop into incidents, or detecting human related factors in incidents before they result in accidents. I suggest that though we are aware some of these human and organizational weaknesses, we are failing to report them.

To reduce the number of human factor related accidents; we require a change in investigation philosophy. We need to change from a focus on post-accident analysis that emphasizes what went wrong after the fact to a study of pre-accident hazards and incidents that can yield data before an accident occurs.

The bottom line is that I am looking for support from all personnel who fly, maintain, and support our aircraft, and all personnel who work in our headquarters, to detect our weaknesses before they cause accidents. At DFS, we are also embarking on a Human Factors Project to increase our capabilities to access, integrate, and analyze human factors data, thereby improving safety by detecting weaknesses and strengths before we have accidents.

Safety is a people orientated business! ◆

From the Editor

Whoever stated that flexibility was the key to successful military operations most likely had not encountered the brick wall at the end of the fiscal year. I was happily putting the finishing touches on the winter issue of *Flight Comment* when I received a phone call telling me I had thirteen working days to put together the spring issue. Ouch, who moved the goal posts? Regardless, the job has been done and it is now time to talk a little bit about what you'll see in this issue, and some plans for the future.

Aside from being a splendid piece of Victorian prose, "*Airsport 1861: Balloon Ascent from Cremorne*" has a remarkably modern safety message. If you read the article carefully you'll be able to identify some very contemporary human factors at work in the accident scenario. Equally progressive is the author's inclusion of recommendations to prevent future accidents.

Your response to the readership survey has been heartening. If you haven't answered, and don't feel like filling in a card, remember you can respond on-line through the DFS Intranet site. I'll be publishing the results of the survey in the fall issue of Flight Comment so there is still time to get in your two cents worth.

In 1995 DFS published a poster and video catalogue. Although it is no longer possible to publish the catalogue as a separate document, I am planning to produce an abridged version inclusion as an insert in the next edition.

We recently purchased a Controlled Flight Into Terrain (CFIT) Training Aid. The prevention package consists of two workbooks, a videotape, and a CD-ROM that incorporates the contents of the video and books. The package is available on loan from DFS. Requests for loan of the package may be made via message, E-mail, fax, Intranet, or the Internet, and should be addressed to DFS 3-3. ◆

The Media and Accident Investigation

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Introduction

Aircraft accidents…reporters, cameras, interviews…victims, survivors…the public. Let's face it, twisted metal, fire and smoke, death, destruction and charred remains all make fascinating headlines after a major plane crash. Whether we like to admit it or not, air disasters hold a strange fascination for most people and the public has a right to be informed.

When a transport plane crashes, the accident immediately becomes a top news priority. The compelling question for the media and the public is all-consuming: "What caused the crash?" This is the pressing issue as reporters try to piece the puzzle together quickly and solve the mystery of the crash by deadline. Veteran aviation journalists are aware of the pitfalls that this poses.

Could it be that reporters attempt this nearly impossible feat because they believe they are objective auditors of life's events? Whatever the reason, reporters go to great lengths to uncover the cause of a plane crash.

Media Coverage and Accident Investigation

A problem is that media coverage of air disasters and airline accident investigations are diametrically opposed to one another. Media coverage is based on instant gratification, immediate answers to tough questions, conjecture, speculation and often oversimplification of a complex series of events.

On the other hand, accident investigations (nationally and internationally), are understandably long, drawn out, time consuming endeavors which involve thorough analysis of a myriad of seemingly insignificant details. This comprehensive investigation eventually leads to the determination of probable cause(s) and contributory factors.

Sensationalism pervades media coverage of plane crashes. This troubles those in the aviation industry. In fact, the Air Line Pilots Association and the National Transportation Safety Board are among those who have voiced their concerns over instances of obvious inaccuracies, bias in reporting and apparent misinterpretation of the known facts by the media. The accusation is that the media distorts the news.

According to media critic (*sic*) George Bernard Shaw (paraphrased), "The trouble with the media is that it seems unable to distinguish between the end of the world and a bicycle accident." This is the case when media coverage of incidents such as false engine fire warning lights and blown tires escalate into "near death" experiences.

Some media coverage is more concerned with "what IF" situations rather than "what is." An example of this type of speculative reporting occurred at a Los Angeles airport recently. On a particularly rainy night, a landing jetliner used up most of the available runway to stop. The aircraft came to a stop approximately 50 feet from the end of the runway. No injuries, no damage, no incident — in essence, a non-event. However, the reporters kept probing, "What IF the aircraft hadn't stopped?" and focused their stories on such speculation.

Inaccuracies, Bias and Distortion

Do headlines tell the whole story? Do they mislead public perception about an accident? Does media coverage hinder the accident investigation process? These are some issues that need to be addressed, although the problem of media distortion has been around for a long time.

Consider the following illustration. In 1948, a DC-3 used by an airline to test new equipment crashed in the bay off La Guardia Airport, killing the two crew members on board. At the morgue, there was an unmistakable odor of alcohol emanating from the bodies. Tests confirmed the presence of alcohol in the blood and the local newspapers headlined "Intoxicated Crew Causes Crash." The District Attorney became involved (or interested).

Blood specimens sent to Yale University for diagnosis and tests confirmed the presence of alcohol. However, it was the presence of wood alcohol, and not grain alcohol, which are used in cocktails. The crew had been testing a new propeller deicing installation. Several cans of wood alcohol, used for deicing, had been placed in the cockpit. The force of the crash ruptured the cans; the released alcohol was ingested by the pilots.

As you can see, the accusation of drunken pilots causing the crash was wrong.

Reputations were jeopardized by impulsive journalists or their news editors. Fiorello La Guardia, the mayor of New York, in a campaign speech advised his political opponents to "Be sure of your facts before you distort them." This admonition definitely applies to media coverage of aircraft accidents.

Last year, another accident occurred at La Guardia. A commercial jetliner, with 63 passengers and crew on board aborted the take-off and crashed into the bay. Two passengers were killed, but the other occupants escaped serious injury. The press coverage that followed can only be characterized as a "media circus."

Headline: Hit and Run at La Guardia: Mysterious Absences and Confusion in the Cockpit

Headline: Pilots Duck Crash Probe

Headline: Crash Pilots May Have Been Drinking

Headline: Cocaine Found on Crash Jet

And the sensational headlines continued, despite the fact that they were found to be erroneous. As each day passed, bits and pieces of information surfaced which led reporters to further speculation and distortion concerning the circumstances surrounding this crash.

The press coverage of these two accidents demonstrates that inaccuracies, bias in reporting and media distortions do exist. The situation is so alarming to the aviation community and the journalism profession that a new discipline, called meta-journalism, is emerging. This new, but related discipline is designed to deal critically with the discipline of journalism – and some reporters are doing just that. Numerous articles have been written by reporters criticizing their own people on irresponsible and inaccurate press practices, including Christopher Hanson's, "*When Planes Crash, Truth is Often Among the Victims.*"

Media Influence

The press exerts a collective influence on the general public on key issues and events because increasingly more sophisticated communication links are being utilized. They range from fiber optic cables to satellites. Today's advanced electronic media can bypass former limitations to communication. Time and distance are no longer barriers to up-to-the minute news coverage.

These advances are keenly emphasized by current events. The crisis in the Middle East is not just a litany of cold facts: it has feeling and movement – and we are there, every night. State-of-the-art communication technology allows us to experience the disaster as it is happening and be able to relive it, over and over again.

The United Airlines Sioux City accident is another example of being able to relive the event moment by moment. We do not criticize the media for displaying the actual event as it happened, because it is news. But television news has a powerful effect: it combines emotion, image, style and persuasion to create a powerhouse communication tool. Television, through visual images, has the ability to shape public opinion and influence the perception of any given event, either positively or negatively. And as you all know, perception is everything...The public doesn't know what it doesn't see, hear or read. Therefore, "reality" has become what the media presents, more so than the events themselves.

Experienced journalists are aware that how they utilize the facts and their interpretation of demonstrable truth, is as important as the facts themselves. Public expectation imposes certain demands on the media to try to deliver what the public wants. This quest to satisfy the public expectation for instant information can result in premature conclusions, which may distort the truth. We praise the reporters who have the fortitude and patience to wait for sound evidence before drawing conclusions about a crash.

How and Why Does Media Distortion Occur?

Existence of Bias

Generally speaking, the media are daily mirrors of events and activities. They reflect society's thoughts and deeds. Many of us hold onto the idealistic notion that we maintain a totally objective media. In reality, this cannot and does not exist.

Bias is inherent in covering any story, including an airplane crash, and will come from reporters' and editors' indifference or prejudice to certain issues and even from people's blind spots. Bias also develops from media sensitivity: a cognitive function that influences the choice of facts and circumstances by being sensitive to some and ignoring others.

Media bias is evident in the coverage of other public concerns such as the pro-choice/anti-abortion issue. *The Los Angeles Times* published an exhaustive survey stating the media have a definite pro-choice bias. Media critic David Shaw conducted more than 100 interviews and studied abortion news coverage for over 18 months. He found "scores of examples…that can only be characterized as unfair to opponents of abortion, either in content, tone, choice of language or prominence of play."

Media as Business

The sensationalism of an event and its ultimate perception by the public results from the fact that the media is a competitive business. Ultimately, they depend on the goodwill and support of the "customers" – the readers, viewers and advertisers. Networks are concerned with ratings, newspapers with circulation.

So the driving force becomes "capturing" an audience in competition with rival media. Sensational air disasters tend to generate public concern or morbid curiosity which arouses the public attention. Disturbing news gets through much more effectively than positive or neutral news and as long as the tragic news keeps coming, the audience stays tuned. Reporters who are objective must feed their information to editorial offices. Is it possible that some distortions are generated there?

In line with understanding that media is big business, we must recognize that reporters and journalists are an extremely competitive lot. The better the story, the more chance for a promotion, a bigger job or even that much sought after (but illusive) journalism award. We applaud those journalists who are able to monitor their personal circumstances to report objectively.

Lack of Proper Corroboration

Distortion in media coverage arises from reporters using terms such as "reportedly" or "as reported in." This implies that facts were not checked for accuracy, because they have been used before and thus have met slander or libel requirements. We understand that with breaking news, like a plane crash, there isn't always enough time before deadline to verify or corroborate all the facts.

However, "reportedly" is being used, as a short-cut to responsible reporting and so is the use of unnamed sources. Consider the *New York Daily News* article about the pilot involved in last year's La Guardia crash who covered his face while being interviewed by Port Authority detectives:

"...*the Daily News learned.*"

"...*an investigator said.*"

"...*the source said.*"

Not one verifiable or credible source was quoted in the story

Modern Technology

Increasingly sophisticated computer technology may tend to compound errors resulting from unverified or incomplete information. Databases index most major articles and are readily available to journalists for background material and supporting data. Often these articles contain mistakes and inaccuracies, which when used, allow misinformation to surface again, perpetuating media distortion.

Therefore, individuals or organizations who believe that the media distorted the truth by printing inaccurate information, have an obligation to ensure that a correction is printed. This correction amends and clarifies the original record because if the inaccuracy is ignored, the distortion continues to live on.

Unfamiliarity with Aviation

Journalists' inexperience in covering air crashes is partially a result of aviation's excellent safety record. Airline accidents are relatively rare occurrences and reporters may be unprepared for dealing with such a dynamic, complex situation.

Some distortion should be expected when a relatively inexperienced reporter is thrust into the midst of covering a complex event like a major airline accident. Unfamiliarity with the accident investigation process, airline terminology and aviation safety can give rise to inaccuracies and distortion as available information is released.

Few people, including inexperienced reporters, are aware that a first officer and captain routinely alternate aircraft take-off and landing duties. The statement "the copilot was at the controls" can lead the uninitiated to draw many erroneous conclusions, including that the captain was incapacitated, irresponsible or even away from the flight deck as the aircraft was landing.

What Impact Does the Media Have on the Investigation

Interference at Accident Site

Intrusion by uninvited guests at the crash site have posed problems for accident investigators trying to do their jobs. Investigators need to deal with the often times unwanted presence of the media, which is perceived as hampering and interfering with the investigation process.

At a recent aircraft accident site, over forty members of the newspaper and television media appeared within hours of the crash. Some tried to get into survivors' hospital rooms and temporary morgues. Others resorted to ingenious tactics such as hiring a helicopter and hovering over the site thereby interfering with communication, rescue and recovery operations.

Speculation and Cause du Jour

Media competition and the lack of immediate answers may induce reporters to speculate on the cause of the crash. This tendency for speculation is made worse when there is no authorized spokesperson available to respond to press inquiries. Reporters who cannot reach someone for comment may end up drawing their own conclusions, based on sketchy information in order to fill the void, until official public information representatives arrive at the scene to provide factual details.

The following is an example of what happens when little or authorized information is available to the media. Shortly after the Chernobyl disaster in the Soviet Union, *United Press International* (the wire service) quoted an unidentified resident of Kiev who said (incorrectly) that the death toll would be over 2,000. The *New York Times* quoted a tourist from Long Island who repeated what he had heard from his tour guide about fatalities. Both "unconfirmed" reports started a chain reaction of misinformation. This resulted in Premier Mikhail Gorbachev blaming the Western media for exaggerating and distorting the severity of the crisis.

This was true shortly after the accident, but later events showed that the effects were much worse than originally thought. Neither the press nor Gorbachev were correct in their speculations.

The media sometimes draws premature conclusions from access to information that can be taken out of context, such as cockpit voice recordings. After the cockpit tapes in the La Guardia crash were made public, headlines read "Pilots in New York Crash called Frustrated, Impatient." The pilot's dialogue was taken out of context and inferences were made on their emotional condition based on a few remarks gleaned from the transcript.

There is pending legislation to extend the delay for release of the transcripts of cockpit voice tapes after an accident. Currently, the NTSB has 60 days after a crash to make portions of the transcript public and these tapes usually receive considerable publicity. ALPA cites invasion of crewmember privacy and journalists see delaying release of transcripts as interfering with timely reporting of information.

Damaging Reputations

Since over 70 percent of aviation accidents are caused by some sort of human performance failure, it is easy to see how reporters might jump to conclusions about "pilot error." Speculative reporting, without conclusive evidence, can damage pilot reputations and create a negative perception of the entire profession.

The Air Line Pilots Association is very concerned about the negative publicity pilots have been getting. So concerned that they have started an image campaign focusing on the professionalism of pilots. Inaccurate reporting is not only damaging to people and their careers, but it is damaging to organizations as the following account demonstrates.

At the request of the FAA, all certificated airlines must submit reports of in-flight mechanical difficulties involving critical safety equipment. A large, conscientious airline decided to do "what was right" by submitting all mechanical difficulties, safety related and otherwise. This was in contrast to competitors, who were submitting only the required information, thus making this airline's list very long compared to the others.

A reporter for a prominent daily newspaper, who, in the words of an officer of the airline "was probably out to win the Nobel prize for safety," was given the entire FAA files on mechanical malfunctions. It did not take the reporter long to discover this airline's predominance in number of mechanical difficulties. A column appeared in the paper naming that airline as the most dangerous in the nation, because of the relative number of mechanicals reported. The adverse report was copied widely, seriously damaging the reputation of a very fine airline.

Influencing Eyewitnesses

Often it is the media, not the accident investigators who are the first to interview eyewitnesses and survivors at the scene. Research has established that questions asked about an event influence the way eyewitnesses "remember" what they actually saw (Loftus, 1977). This is consistent with the premise that memory undergoes a change as a result of the type of question asked.

As a result, credible eyewitnesses can have their recollections tainted after grueling media interviews. That may be damaging to the accident investigation, since eyewitnesses often provide valuable information.

Accident investigators are trained in non-confrontational witness interrogation techniques, but the media are trained in investigative reporting. While the media searches for blame; the government investigator searches for probable cause(s) to prevent an accident from happening again.

Psychological Distress

It's bad enough to have been involved in an airplane crash. But it is even worse for survivors, victims and relatives to experience an emotional roller coaster as headlines tout a new cause for the crash on a daily basis. Often the only information available to the public is from the news media. Inaccuracies and distortions in media coverage can create negative perceptions while prolonging the agony of persons involved in the crash.

Effects on the Accident Findings

Although media activity may influence the course of an investigation, they have no bearing on the ultimate findings. This is because accident investigators are professionals, doing a professional job. According to one of the authors, who was the first Director, Safety Bureau of the CAB (from which the NTSB stems), "I can't recall any impact by the media on the findings of an investigation and my tenure included the deaths of Senator Lundeen and actress Carol Lombard, wife of Clark Gable. Basically, we as accident investigators went on about our business as though there was no media. Our public affairs officer dealt with the press on the basis of factual information."

How Can We Promote Fair and Accurate Reporting Aviation Accident?

Education

One way to promote fair and accurate reporting of aviation accidents is to educate reporters on the process of accident investigation. This education has already been done by the Aviation/Space Writers Association with the publication of its pamphlet "Air Accidents and the News Media." This media tool provides a reference for reporters, writers, editors and photographers who may be assigned the job of covering an aircraft accident.

In addition to understanding the complex process of accident investigation, reporters who specialize in aviation and possess some technical knowledge can be assigned to cover air accidents, rather than the food or business reporter. It is helpful to understand the particulars of the industry as this can be a tremendous asset to provide unbiased, factual coverage. Of course the managing editor may accuse us of ignorance in media operations.

The press can also help to recover a more "objective" tradition by not taking an accusatory posture and by ceasing exploit air accidents for their sensationalistic value. Perhaps ISASI could offer the services of selected members to assist the media in aviation accident reporting.

It is not only the media who can benefit from the educational process. Accident investigators need to understand the role and responsibilities of the press as well. Knowing what to expect from reporters can help investigators prepare for their unavoidable involvement and participation in divulging only factual data devoid of speculation.

Pro-active Media Relations

The development of a pro-active media relations program should also encourage responsible media coverage of accidents. It is critical to build relationships with key media personnel to establish an open and honest relationship, before an accident happens.

Long term benefits for the public, the media and aviation would result from maintaining a mutually beneficial relationship for both parties. The media can be extremely helpful to the affected airline and the investigation by broadcasting contact numbers for passenger inquiries, locating eyewitnesses or even finding pieces of wreckage. In the Sioux City accident, media reports about missing aircraft wreckage were widely publicized and resulted in the eventual recovery of a critical engine part, which proved to be important for the investigation.

Media relations need to be an integral part of any accident response plan. The press cannot be viewed as the "enemy"; they must be accepted as a (limited) member of the accident investigation team.

Spokesperson

Intelligent, knowledgeable, respected, calm, articulate, accessible, convincing...these adjectives all describe the ideal media spokesperson. This person provides the communication link between the accident scene and the outside world. Media training must be an ongoing effort to keep airline and government public information officers sensitive to the needs of the press and to equip them with the necessary skills to communicate effectively. Their primary concerns are to maintain credibility and integrity, squelch rumors by correcting inaccuracies and provide up to date information.

Effective media relations utilize all resources, including people familiar with various aircraft systems who become technical advisors to the spokesperson. Information that is released must be conveyed in the context of investigation and the media must be periodically reminded that updates (in and of themselves) are conclusive. The concept of Cockpit Resource Management should be applied to industry-media relations for emergency situations.

Cooperative Relationships

In order for accident investigators and the media to work effectively together, they must have mutual respect for each other and be prepared to deal with the inevitable conflicts that will arise. Paramount is understanding each other's responsibilities and limitations. Appreciating the media's role by putting yourself in their shoes can offer insight which up to now may have largely been overlooked.

Knowing the media's needs and attempting to accommodate its requirements is crucial to a cooperative relationship. This can be as simple as having a "talking head" to reiterate that no further information is available at this time, rather than the "no comment" approach. Understanding, tolerance and accommodation are necessary to establish a mutually beneficial relationship, which will result in more balanced media coverage of plane crashes.

Conclusion

When the next airplane crashes, you can be sure that it will still generate a lot of public interest and media attention, resulting in possible inaccuracies and media distortion. Accident investigators and the media must work together as professionals to provide fair, accurate and objective media coverage of all airline accidents

In summary, this can be achieved by being aware of possible distortion, by developing a cooperative relationship with the media and by providing education and training for those responsible for press relations.

The authors wish to express their appreciation to the many journalists, reporters and editors, who over the years have contributed to the safety of aviation by vigorous, but non-sensational reporting of facts. They enjoy the satisfaction of informing the public without having to explain previous distortions and should be given appropriate credit.

We recognize that there are many reporters and journalists who have been constructive in writing about accidents in the past. We recommend that ISASI and AWA jointly provide for an annual award or praise for media efforts to report accidents objectively, candidly and dispassionately.

The views expressed in this paper are those of the authors, and do not represent any company or organization. ◆

References

Aviation/Space Writers Association Publication: *Air Accidents and the News Media*. 1988 Edition.

Bender, David L. and Leone, B. (1988) *The Mass Media*. Minnesota: Greenhaven Press.

Boot, William. *The Accidental Journalist*. Columbia Journalism Review. January/February, 1990.

Boynton, Phil R. (1989) *Winning the Media Game*. Toronto, Canada: Stoddard Publishing Co. Ltd.

Cross, Donna W. (1983) *Media Speak*. New York: Coward McCann, Inc.

Loftus, Elizabeth F. (1977) *Reconstructing Memory: The Incredible Eyewitness*. Psychology Today.

Merriam, John E. and Makower, Joel. (1988) *Trend Watching*. New York: Tilden Press.

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In her present position, Dr. Huff is responsible for media contact, employee communications, public relations, government affairs and corporate emergency preparedness for USAir.

Dr. Huff has experience in aircraft accident investigation, provided pre-accident training and has conducted post crisis debriefings following several major airline accidents.

Jerome Lederer began his aviation career in the mid-1920's as an aeronautical engineer with the U. S. Air Mail Service. During the 1930's, he served as chief engineer of the Aero Insurance Underwriters; in 1940, he was appointed the first Director of the Safety Bureau of the Civil Aeronautics Board. In 1947, he organized the Flight Safety Foundation and was appointed its managing director, concurrently serving as director of the Cornell-Guggenheim Aviation Safety Center.

In 1967, Lederer was asked to organize and direct the Office of Manned Space Flight Safety for the National Aeronautics and Space Administration, later becoming Director of Safety for all of NASA.

Lederer has received in excess of 60 awards and honors including the NASA Exceptional Service Medal, the Guggenheim Medal, the Wright Brothers Memorial Trophy, the Laura Tabor Barbour Award, the Amelia Earhart Medal, the AWA Distinguished Public Service Award and two medals from the Soviet Federation of Cosmonauts.

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(30) Thirty Tips for Supervisors

Anyone who has ever served in the military will know that when the balloon has gone up and the chips are down, 'consensus' and 'nice talk' from leaders usually goes out the window. When ordered to jump one normally only asks: 'How high?'

Nevertheless, there are well proven right and wrong ways of going about interacting with subordinates. Learn from the following.

1. Make people on your staff want to do things. This is one of the really basic rules for getting the job done through people. The individual who gets results through others is a leader, not a driver.

People will do things reluctantly for a driver because they are forced into it. They will do their jobs enthusiastically for a leader because they want to. There are many ways of getting people to want to do things.

2. Study subordinates and determine what makes each one tick. Continuous study of people working under an executive is a 'must' for getting things done through people. Their motives and attitudes are the main tools the executive uses, and can only be determined by studying them. Building up the importance of their work and themselves can be a most effective and beneficial action.

Yet people vary widely in many other characteristics. Well-timed praise may spur one person to new heights of effectiveness. But it may only inflate another; a better spur might be constructive criticism. A third individual may wilt under any kind of criticism; some other factor is needed and the capable executive finds it.

Searches should also go beyond the office for background. People's motives and attitudes are heavily conditioned by personal history and home life. Thus, tactful drawing out of subordinates can be very useful.

3. Be a good listener. The executives who know their people – their worries, personalities, touch points, and pet prides – know why they tick and what motivates them. The best, fastest way to know them is to encourage them to talk, to draw them out, to ask questions. A good listener does this best; a teller encourages them only to be silent. Never dominate a conversation or a meeting – unless for a good reason. If both you and one of your people start to say something at the same time, always let them speak first.

An objection to the idea of being a good listener: it takes time to draw people out. Answer: it takes time to plan, too. Both are essential to the executive job.

4. Criticize or reprove constructively. Get all the facts, review them and win agreement on them. Then suggest a constructive course for future action. When you criticise, be sure it's the method, not the motive, that is questioned. If you can precede the criticism by a bit of praise, so much the better. But some executives do this so regularly that their people get wise and the compliment loses its value.

5. Criticize or reprove in private. Obvious? Perhaps. But this fundamental rule is broken every day in hundreds of organizations. Reprimands in the presence of others cause shame, humiliation, and resentment instead of a desire to do better next time. And to criticise subordinates while people from their department are present undermines their authority as well as their morale.

6. Praise in public. Most people thrive on judicious praise – and praise that others can hear multiplies the impact. It raises the moral, standing, and self-confidence of any person. That is important in developing capable junior officers. But be sure that the person who is praised is the one that deserves it, and that other people who are involved get recognition too.

7. Be considerate. Nothing contributes more to building strong, hard-working, loyal teams than considerate chiefs. They are courteous to their lieutenants. Chiefs put themselves in the subordinates' place before making any decisions affecting them. They know that their staff have tough problems of their own – both business and personal, and that they have pride, personality, and self respect. Much effective work will be obtained by treating those characteristics as assets rather than by trampling on them.

8. Delegate responsibility for details to subordinates. Another 'obvious' rule that is usually violated. Delegating responsibility is the essence of administration. You are not an executive if you do not delegate, just as you are not a machinist if you cannot run a machine. Executives who insist on keeping a hand in details discourage their subordinates by competing with them.

Capable personnel will quit; others will sit back and let the executive do the work. And the 'boss' will have no time for the thinking and planning that are important parts of his or her job.

Photo by Mike Reynol Skytech Images

9. **Give credit where it is due.** Taking credit for yourself which really belongs to one of your people destroys initiative and a willingness to take responsibility. Giving proper recognition for what subordinates do has a double kick: they get the credit for doing the job and the executives get the credit for building an able staff.

10. **Avoid domination or 'forcefulness'.** Anything of this kind breeds 'yes' people. A dominant executive and subordinates with initiative just don't get along. The over-forceful chief can only drive people – never as restful as the eager cooperation of those who follow a leader. Able executives think of their staff as working with them, not for them.

11. **Show interest in and appreciation of, the other person.** This is another way of saying, 'Be a human being'. Not all people are warm-hearted by nature. But even the coldest-blooded executive can easily take steps to warm relations with the staff. For instance, use first names; make occasional, unplanned luncheon dates with one or two at a time; find a way to mention hobbies, family news, or other not too-personal matters; or arrange informal sessions on lousiness or non business topics.

Interest of this sort will pay dividends many times over in loyalty and accomplishment. And they don't go far enough to violate another rule that many executives believe is sound: keep your business and personal lives separate; avoid mixing them.

12. **Make your wishes known by suggestions or requests.** If your people have initiatives and ability, this will get vastly better results than orders or commands. Issue orders only as a last resort. If you find that only orders work, maybe you need new assistants – or they a new boss.

13. **When you make a request or suggestion, be sure to tell the reasons for doing it.** People want to know not only what they're doing, but why they're doing it. The explanation can be oral or written. But be sure to make it!

14. **Let your assistants in on your plans and programs, even when they're in an early stage.** It's true that plans can't be discussed too far in advance. But they should be discussed with subordinates before they are in final form. It will give them that all-important sense of participation. Furthermore, because they have taken part in shaping the plan, it is as much theirs as yours. They feel personal responsibility for its success; they will carry out the program with snap and precision.

In addition, some of your assistants' ideas may improve on yours – so draw on them before it's too late.

15. **Never forget that executives set the style for their people.** If they are irregular in their habits, late for appointments, careless about facts, bored in attitude – the staff will be too. But if the staff are the right kind of people, they will follow a good example much more eagerly than a bad one.

16. **Play up the positive.** Just as praise is a better stimulant than criticism, so appreciation is better than a lack of it, and building up a person's self respect is far better than tearing it down.

People who are capable of being junior officials need and want respect from their superiors. In building (but certainly not overbuilding) their self-esteem, the chief builds capable assistants and thus builds himself.

17. **Be consistent.** A chief who flies off the handle and sets off fireworks frightens subordinates into their shells; one who gyrates wildly in reaction, mood, and manner, bewilders them. Neither can win the support and confidence of their people, which is essential.

Executives and their junior staff are in the position of leaders and followers. One can truly follow only a leader whose course is steady and whose reactions are predictable.

18. **Show your people you have confidence in them and that you expect them to do their best.** Juniors – and everyone else for that matter – tend to perform according to what is expected of them. If they know their boss has confidence in them to expect a first-rate job, that's what it will usually be.

19. **Ask subordinates for their counsel and help.** This brings them into the picture, gives them a feeling of 'belonging', and builds self-confidence. It also makes them want to work harder than ever.

What is just as important, they have good ideas, which may never see daylight – unless asked for.

20. **When you're wrong or make a mistake – admit it.** Juniors do not expect their chiefs to be infallible, so executives will not lose face when they admit they are wrong – if they aren't wrong too often! What is gained is confidence in executives' fairness and honesty – an asset beyond price to any executive. It has been said that executives ought to make occasional mistakes deliberately, just so they can admit them! But this would seem to be like carrying coals to Newcastle.

21. **Give courteous hearing to ideas from subordinates.** The ideas may sound incredulous, but it's important not to let them know it. There is no surer way to discourage ideas from subordinates than disparagement or ridicule. And the next idea from the person you ridiculed might have been the one you wanted.

22. **If ideas are adopted, tell the originators why.** They will then apply to other problems the same line of thought that got results before. And if an idea is not adopted, explain why, too. If the reasons are good, they will be accepted with good will. If the reasons aren't satisfactory, maybe the idea should have been adopted after all. Ideas that disappear into a void and never heard of again discourage further suggestions.

23. **Give weight to the fact that people best carry out their own ideas.** When two ideas of equal merit crop up, it's usually good strategy to choose the one developed by the person who will carry out the project. He or she will then feel personally responsible to prove that his idea is workable. It's good executive strategy, therefore, to plant the seeds of ideas in the minds of others, so those who execute them will feel they are their own.

24. **Be careful what you say and how you say it.** Whenever you have an important discussion with an assistant, plan in advance what you're going to say and how you're going to say it. Choose you words with care – even in seemingly unimportant discussion and chance remarks.

What the boss says has special impact on subordinates. An unintended inflection of the voice, careless choice of words, bypassing a subject that a subordinate has brought up, can breed misunderstanding and insecurity that interfere with efficient work. Thoughtless remarks – forgotten in a flash by those who make them cause multitudes of restless nights and restless days for those who hear them.

25. **Don't be upset by moderate grousing.** In small doses, griping serves as a safety valve for a characteristic of human nature. People working under the perfect administrator probably would still grouse because he or she was perfect. But continuous, personal griping is another matter and needs to be resolved.

26. **Use every opportunity to build up in subordinates a sense of the importance of their work.** People like to think their jobs are important. Many of us like to feel that we not only have an important job, but are essential to it before we start clicking.

27. **Give your people goals, a sense of direction, something to strive for and achieve.** They need to know where they're going, what they're doing and why they're doing it, in order to plan their course intelligently and work efficiently.

Good junior executives can't get interested in working from day-to-day. So make clear the relationship between their day-to-day work and their larger goals. For example, don't stop with asking them to study the operating costs of a department; tell them that it's part of a plan to provide leeway for salary increases, and that the knowledge gained will strengthen their chances for promotion. And give your people information about your department, organization etc, so they can see themselves and their work in perspective.

28. **Keep people informed on matters affecting them.** Let them know in advance, whenever possible. As members of a team, they are entitled to know what's going on. If kept so informed, their thinking will be more geared to reality and their ideas more practical.

29. **Give subordinates a chance to take part in decisions, particularly those affecting them.** When people feel that they have taken part or had a say in a decision, they are much more likely to go along with it enthusiastically. If they agree with the decision, they will feel it is their own and back it to the hilt. If they don't agree, they will still back it more strongly than otherwise, because they will know that their point of view was considered.

30. **Let your people know where they stand.** The days of 'treat 'em rough and tell 'em nothing' has passed. A system calling for periodical ratings on people is a step in the right direction – but only if ratings are discussed with them so they can bolster weak points and clear up misunderstandings. ◆

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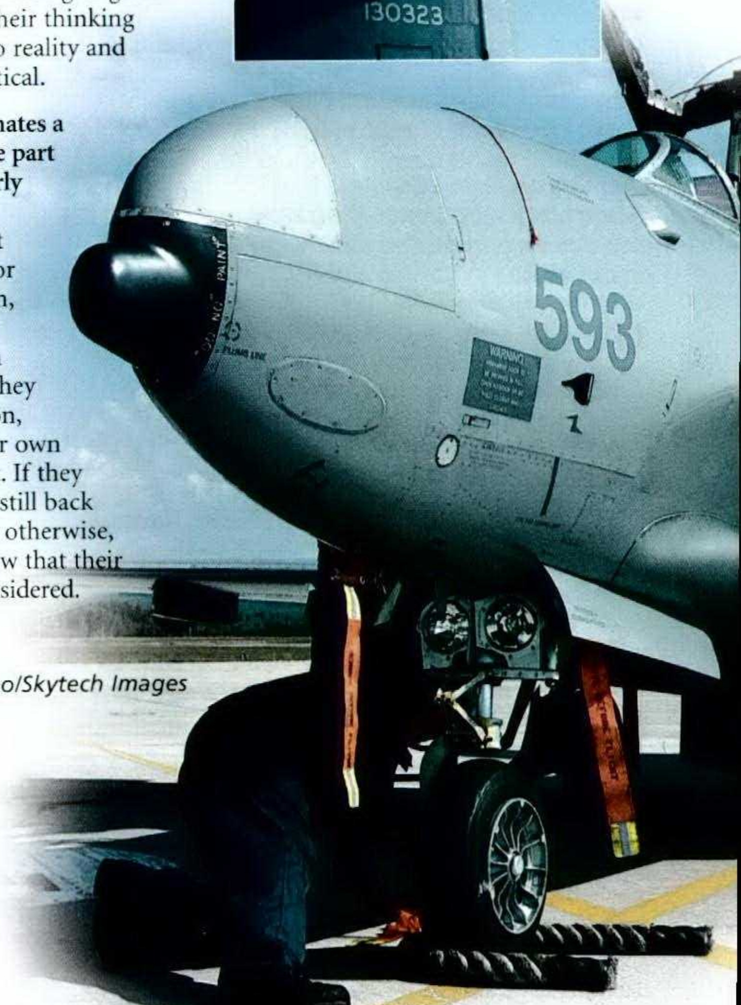

Photos by Mike Reyno/Skytech Images

Photo by Mike Reyno/Skytech Images

A-LOC: A New G-Related Problem

by SQNLDR David Newman MB, BS, DAvMED, MRAeS
Chief Instructor, RAAF Institute of Aviation Medicine

In the May 1998 Issue of DFS-ADF *Flying Feedback*, there was a report concerning a Hornet pilot on conversion course who experienced blackout while executing a high-G manoeuvre. The report described the pilot's experience as being 'consistent with the condition known as "blackout", which has also been referred to as "A-LOC"'. (See story page 12)

Unfortunately, some of the information in the article was incorrect, particularly some of the details relating to the consequences of high-G exposure and the nature of A-LOC. It would appear that some confusion exists as to what exactly A-LOC is. It is a newly described phenomenon that has gained some prominence in recent years. Much of the work in A-LOC has been done by the US Navy, where a number of in-flight incidents have been attributed to this new phenomenon.

The purpose of this article is to set the record straight as to just what is meant by the term A-LOC, and how it is both similar to and different from the more common effects of high-G exposure. It also serves as a way of providing a timely reminder on aspects of high-G physiology relevant to aircrew who fly high-G capable aircraft. I wish to acknowledge the assistance of CMDR David McGowan, USN, for providing some of the information contained in this article.

What is A-LOC?

A-LOC stands for *Almost Loss of Consciousness*. It represents one point on the continuum of G-effects, which range from a simple increase in the apparent weight of the pilot through to G-LOC, or *G-Induced Loss of Consciousness*. A-LOC is not synonymous with blackout, greyout or G-LOC. All of these terms represent different features of a high-G exposure.

A-LOC is defined as G-induced impairment of cerebral function with no corresponding loss of consciousness. It occurs with short duration, rapid onset G exposures, such as three seconds at +6 G. Typically the pilot with an episode of A-LOC will experience mental impairment, often with a loss of situational awareness. The symptoms are many and varied, and are said to depend on which part of the brain is affected. Symptoms reported in US Navy pilots include twitching of the hands, immobility, numbness, tingling, apathy, inability to speak and confusion. It can loosely be described as a short-term version of '*the lights are on but nobody's home*'. The pilot can generally see and hear, but doesn't care about what he is seeing and hearing.

An episode of A-LOC generally only lasts a short time, in the order of approximately five seconds, but the incapacity can extend beyond this time to about 10-15 seconds. The important point to bear in mind is that G-LOC does not necessarily follow an episode of A-LOC. If the G-level is maintained or increased, however, G-LOC may occur, but in this situation it is due to the level of G achieved rather than the episode of A-LOC that occurred previously. If the G is backed off and blood flow returns to the brain, the symptoms of A-LOC will resolve quite quickly.

A-LOC Example

As an example of A-LOC, consider the following incident:

A four-ship formation of USMC F/A-18 aircraft were inbound to the circuit at El Toro at the conclusion of the second sortie of a hot-refuel, two-sortie ACM evolution. The No 3 aircraft went into the pitch at more than the required G-level. The No 4 aircraft saw No 3 drift out of the turn and descend towards the ground. No 4 called '*power, pull-up*'. No 3 heard the call, but subsequently reported that he '*couldn't have cared less*'. He felt that he was having '*a pleasant dream, with no sense of flying*'. During this manoeuvre, No 3 had eased off the G, and once blood flow had returned to his brain he recovered, climbed back up to circuit altitude and landed without further incident.

This example illustrates the fundamental aspects of an episode of A-LOC. The G wasn't spectacularly high, the whole episode lasted only a few seconds and the main symptoms experienced by the pilot were loss of situational awareness and short-term mental impairment. Clearly in such situations A-LOC represents a significant flying safety hazard.

An episode of G-LOC tends to be much more serious, resulting in a far more prolonged period of incapacitation. The average episode of G-LOC results in a period of absolute incapacitation, in which the pilot is, as you might expect, absolutely and totally unconsciousness for a period of approximately 15 seconds. During this time, the unconscious pilot relaxes and the G falls to normal levels. Assuming that height is sufficient, the pilot will then enter a period of relative incapacitation for a further 10-15 seconds. As the G comes off, blood flow to the brain is restored, but initial functioning of the brain is not normal. Confusion, disorientation and lack of situational awareness are all common features in a pilot recovering from a G-LOC. The danger lies in the fact that for effectively 30 seconds the pilot is not flying the aircraft. In 50 per cent of cases, the recovering pilot will not remember having been unconscious. As far as they are aware, they have been awake and in control of their aircraft for the whole sortie.

The mental impairment with GLOC tends to be far more prolonged than that associated with A-LOC. It is, unfortunately, not widely known that 100 per cent of *mental function* after a G-LOC does not return until the next day. After the first 30 seconds of incapacitation, the pilot will be about 90–95 per cent back to normal, sufficient to recover the aircraft safely. However, a full sleep cycle needs to occur before full 100 per cent function returns. I know that to be true from my personal experience in the USAF centrifuge at Brooks AFB, Texas. It is common for pilots recovering from G-LOC to experience some form of psychological suppression or denial as the brain unsuccessfully attempts to explain the loss of some 30 seconds of life. As a result, feelings of apathy, depression and disappointment (among other things!) can linger for the remainder of the day. A good night's sleep is the best treatment.

Greyout and Blackout

Finally, a word on greyout and blackout. Greyout is defined as the loss of peripheral vision, and is a familiar concept to almost every military pilot. It typically occurs at a G-level of +3 to +4 G. A little bit more G, in the order of +4 to +4.5G, and blackout occurs. This is defined as the total loss of vision. All other faculties remain intact-the pilot can still talk, hear and fly the jet. Blackout reflects the fact that the blood pressure in the head is lower than the eye's internal pressure, so that oxygen cannot be delivered to the retina. These low blood pressures are enough to keep the brain ticking over, but increasing the G-level (to about +4.5 to +5.5 G) results in no blood supply to the head and G-LOC will occur as a result. Blackout does not result, as suggested by the *Flying Feedback* article, in a brief period of mental confusion and motor skill incapacity. These features are part of the relative incapacitation period experienced during recovery from GLOC, as discussed above. Lack of vision is simply that and nothing more. It is, however, an indication that pilots experiencing blackout are approaching the limits of their G tolerance. G-LOC will occur if the G is sustained for long enough or increased to a higher level. The symptoms of greyout and blackout should be considered a visual warning to the pilot of impending G-LOC.

It is important not to be confused about these terms. They are not one and the same thing — A-LOC is not the same as blackout. Greyout, blackout, A-LOC and G-LOC represent different aspects of the continuum of G-effects. Future fighter aircraft are going to be capable of higher levels of G than those currently available, and the overall G environment will be even more complex. A-LOC will no doubt be increasingly recognized as a cause of temporary pilot impairment. All pilots who operate in a high-G environment need to be aware of the A-LOC phenomenon.

Fly safe! ◆

About the Author

SQNLDR David Newman joined the RAAF in 1987 and graduated from Monash University Faculty of Medicine in 1989. After internship and residency at the Alfred Hospital in Melbourne, he was posted to Point Cook, Laverton and then Williamtown where he spent three years. In 1997 he was on exchange with the RAF, where he completed the Diploma in Aviation Medicine Course at Farnborough (and won the prize for top student). In February 1998 he assumed his current position of Chief Instructor at the RAAF Institute of Aviation Medicine at Edinburgh, SA.

David is a specialist in high-G physiology, and is currently completing his PhD in cardiovascular adaptation to G. He has published widely on aviation medicine topics, and is a member of several organisations, including the Aerospace Medical Association, the International Society for Gravitational Physiology, and the New York: Academy of Sciences.

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Hornet Pilot blAckOUt

The mission had progressed through an initial SOP 'G warm-up' manoeuvre and three defensive ACM set-ups. During the fourth set-up Hornet 2 had levelled off using 0.4g for approximately five seconds. The front-seat student prematurely initiated the break turn with an inhalation and then rolled out to wait for Hornet I's break call, which came approximately two seconds later. A second inhalation was not performed and Hornet 2 commenced a nose-low slicing break turn with G peaking at 7.0. The G-application rate was constant to 7.0 and after approximately 90° of turn (five seconds) G was decreased to 4.5 g with the aircraft continuing in a nose-low slice of 20° down at 14 500 ft. The student in Hornet 2 attempted to transmit a 'knock it off' call on two occasions; however, due to mental confusion and motor skill incapacitation, was unable to push the transmit switch. At this stage the rear-seat captain took control and terminated the fight. The student recovered his orientation approximately five seconds later. The mission was terminated and the aircraft returned to base with the rear-seat captain flying, although the front-seat pilot was given control approximately ten minutes later for the circuit and landing. The aircraft subsequently landed without further incident.

After the sortie the student indicated to his instructor that he had suffered a complete blackout with spatial disorientation, but was aware of an apparent G-LOC condition. He added that he was unable to recover the aircraft. A medical examination of the student determined that:

- he had participated in no other flying within the previous 24 hours;
- he had consumed a normal breakfast that morning;
- he was on no medication;
- there had been no period of sleep deprivation over the three previous evenings; and
- he remained medically fit for flying duties.

The experience described by the pilot is consistent with the condition known as 'blackout', which has also been referred to as 'A-LOC'. This refers to a total loss of vision due to a reduction in blood flow to the retina. It does not imply a total loss of consciousness (G-LOC). The brief period of mental confusion and motor skill incapacity can be attributed to the total loss of vision. Had the pilot sustained true G-LOC, the period of total incapacitation would have been much longer (usually 30 seconds) and which is followed by a period of partial incapacitation (up to two minutes). It is also accompanied by a total loss of memory of the events which occurred during the period of unconsciousness and for a period thereafter.

The student recalled not performing an adequate anti-G straining manoeuvre at the time of the incident. This was ineffective due to calling tally and chaff and flares into the video tape. The cause relates directly to the student's ineffective anti-G strain. The blackout condition was recognised immediately by the student and obviously took time to communicate to the rear-seat pilot. Further, it took a reasonable time (five seconds) for the instructor to distinguish between student inattention/ability and incapacitation. This is a normal reaction time and highlights to other instructional staff the requirement to be vigilant regarding student state during high-G manoeuvres. ◆

Epilogue

TYPE: CF188771
LOCATION: 4 Wing, Cold Lake
DATE: 20 November 1996

The mishap aircraft was undergoing a No. 1 Periodic Maintenance Inspection. While attempting to rig the Left Hand (LH) Main Landing Gear (MLG), it was determined that the LH MLG connecting link was unserviceable. Working alone, an airframe technician disconnected the lower end of the connecting link, placed the landing gear handle in the "UP" position and applied external power. Using a hydraulic test stand, the technician applied full volume and then increased the hydraulic pressure to unlock the LH MLG side brace assembly. The nose gear and RH MLG were pinned. The side brace unlocked and the LH MLG retracted into the LH wheel well before the technician was able to reduce the hydraulic pressure. Because the connecting link was not attached, the LH MLG was misaligned and it became jammed against the inboard MLG emergency stop plate. The technician and his supervisor inspected the jammed landing gear and incorrectly concluded that it was safely locked in the retracted position. Unable to re-attach the connecting link, the technician and his supervisor decided to reposition the LH MLG by releasing pressure from the MLG shock absorber. When pressure was released from the shock absorber, the LH MLG fell and extended aft, binding against the rear fuselage former bulkhead. The former was deformed approximately one inch aft and the aircraft sustained D-category damage. Fortunately, there were no injuries.

The task of replacing the MLG connecting link was carried out contrary to a maintenance message (DFTEM 236244, 181700Z Nov 93) which states that a single gear should not be retracted while other gears are pinned. The mishap personnel were not aware of this message, which had been promulgated three years prior to the occurrence, and the technical instructions had not been amended to reflect this restriction. One implication of retracting a partially pinned landing gear system is that the free gear will retract more quickly than normal.

Although the maintenance instruction does not specify how many people are required to conduct maintenance landing gear retractions, the technician was aware that a minimum of three personnel were normally involved in this procedure. The technician chose to attempt this procedure alone. He also positioned the hydraulic cart on the right side of the aircraft, such that he could not see the LH MLG side brace assembly to determine when it was unlocked.

Once the LH MLG was jammed, the technician and his supervisor agreed on course of action which they felt would rectify the situation. In fact, the actions subsequently taken by the technician and his supervisor exacerbated the original problem and resulted in D-category damage to the aircraft. The technician and his supervisor were faced with an unusual problem which they had no previous experience in dealing with. Their decision to proceed with undue haste and without consultation represents an error in judgement. The investigation concluded that this error in judgement was the primary cause of the occurrence.

Following the occurrence, the technical orders were amended to include the partial pinning restriction and to clarify the number of people required to complete a maintenance gear retraction. Squadron maintenance personnel also prepared a change proposal to CFTO Work package 043, which reduces the risk of retracting a partially disassembled main gear assembly into the wheel well. Finally, unit maintenance personnel were reminded that when faced with an abnormal situation they should step back, get help and carefully think through all possible solutions before acting. ◆

Epilogue

TYPE: CC144610
LOCATION: Keflavik, Iceland
DATE: 29 Sep 1997

On 29 September 1997, 434 (CS) Squadron was tasked to conduct an air evacuation mission from Sarajevo to Fredericton, NB. A Challenger aircraft departed 14 Wing Greenwood at 0320 UTC with 5 persons on board and landed four hours later in very windy conditions at Keflavik, Iceland. While taxiing toward the Keflavik terminal area on taxiway E2, a strong and gusty crosswind lifted the right wing of the aircraft. As the crew attempted to manoeuvre the aircraft into the wind, the aircraft departed the paved taxiway surface and rolled approximately 1200 feet through the grass and gravel infield before coming to rest in the mud. The aircraft was shut down and evacuated without further incident.

The investigation determined that the aircraft was fully serviceable prior to leaving the paved taxiway surface at Keflavik. However, normal aircraft braking was lost when the wind caused the right aircraft wing to rise. Although the right main landing gear (MLG) remained in contact with the taxiway surface, the right aircraft wing was lifted sufficiently high to open the right MLG weight-on-wheels (WOW) switch, causing the landing gear control unit (LGCU) to register an "airborne" condition. Below 35 knots, the aircraft brakes are disabled if either MLG WOW switch opens and the anti-skid system is armed, as it was on the mishap aircraft. Aircraft brakes can be restored by turning the anti-skid system off and reapplying brake pressure. The aircrew did not turn off the anti-skid system. This procedure is explained in the Challenger Aircraft Operating Manual and the Challenger Quick Response Handbook, but the procedure is not a required memory item. As the aircraft rolled through the infield, the landing gear wiring harnesses, connectors and WOW proximity switches were damaged and the aircraft nose-wheel steering (NWS) and brakes became inoperative.

At the time of the mishap, the actual wind at Keflavik peaked at slightly higher than the 50-knot total wind limit specified in the 434 (CS) Squadron SOPs. The 50-knot total wind limit and 25-knot crosswind limit were analysed by AETE and shown to be valid for a lightly loaded aircraft with flaps retracted and spoilers deployed. It was determined, however, that the configuration of the mishap aircraft (flaps 30, spoilers IN), allowed the wind to lift the right wing and resulted directly in the pilot's inability to maintain directional control of the aircraft.

The investigation also concluded that existing aircraft documentation does not provide guidance about how to configure the aircraft when taxiing in high wind conditions.

The investigation observed that the aircraft commander selected a destination and IFR alternate airfields where the winds were forecast to exceed the absolute aircraft wind limit of 50 knots. As well, the forecast ceiling at the alternate airfield did not comply with CFP 100 weather criteria and the mishap aircrew did not satisfy 434 (CS) Squadron crew rest requirements. The investigation cited inadequate supervision, aircrew judgement, fatigue and circadian disrythmia (jet lag) as factors which contributed to the mishap.

Following this occurrence, a duty supervisor system was implemented at 434 Squadron. The Squadron SOPs were amended to include guidelines for taxiing in high wind conditions and actions to be taken when leaving a paved surface. Flying operations were suspended for two days while Squadron aircrew addressed issues pertaining to culture and norms. The absolute requirement to comply with all applicable orders, directives and regulations was communicated to all Squadron aircrew. The DND Challenger Aircraft Operating Manual will be amended to specify a total wind limit for take-off and landings of 50-knots (including gusts) and a crosswind limit for take-off and lands of 25-knots (including gusts). The Aircraft Operating Manual will also be amended to specify flap, spoiler and aileron positioning during ground operations in high wind conditions. Finally, the immediate actions in the event of brake degradation will be established as a "required memory item" for all CF Challenger pilots. ◆

From the Investigator

TYPE: CT114156 Tutor
LOCATION: Moose Jaw SK, R180/26nm
DATE: 10 December 1998

On the morning of 10 Dec 98, a formation of six aircraft from 431 (AD) Sqn was conducting training manoeuvres to the South of CFB Moose Jaw. The aircraft were in arrow formation with the outer left echelon position vacant. The manoeuvre, called an "up and down left spiral right" comprised a left wingover followed by a descent to a reversing right level turn. The appointed Team lead was not present and the formation was being led by Snowbird #7.

As the formation rolled through approximately 50 degrees of right bank in a level turn at 1200' AGL and 260 KIAS, the underside of the left wing of aircraft number 6 came into contact with the upper surface of the right horizontal stabilizer of aircraft number 2.

The entire horizontal stabiliser and part of the vertical stabiliser separated from aircraft #2 and the aircraft dropped through the bottom of the formation. The #2 aircraft rolled inverted under extreme negative G, stalled and fell vertically to the ground. The pilot ejected from the aircraft and suffered fatal injuries upon impacting the ground. The aircraft struck the ground in an inverted position and sustained 'A' category damage.

At the moment of impact, the position error between aircraft #2 and aircraft #6 was approximately 14' laterally and 5' vertically. The preliminary investigation has not yet found evidence of pre-impact material failure or system malfunctions that might have contributed to the accident. Part of the aircraft wreckage has been shipped to Ottawa for detailed analysis.

The investigation has not yet determined if the pilot of aircraft #2 ejected within the prescribed ejection envelop. However, it has been determined that the airlock fasteners on the pilot's rigid seat survival kit (RSSK) were not connected when seat/man separation was initiated. The pilot's maritime lanyard was also not connected. Post ejection contact occurred between the pilot, the ejection seat and the unattached RSSK. The significance of this post ejection contact has not been determined and is under investigation.

The investigation has moved from 15 Wing Moose Jaw to DFS Ottawa. ◆

From the Investigator

TYPE: Hypoxia – CC 130 Hercules
LOCATION: Thule, Greenland
DATE: 27 August 1998

On August 27th a CC130 crew departed Thule, Greenland for Eureka, NWT with two deadhead CC130 crews on board to recover two weather-diverted aircraft. After take-off the crew became aware of the lack of heat in the cargo compartment. Passing 3000 and 10,000 feet the AC noted that the pressurization was weak and discussed the issue of maintaining the cabin altitude at 10,000 feet while the FE continued attempts to control the cabin pressure manually.

The aircraft leveled off at FL180 with the cabin altitude nearing 10,000 and a cabin differential of approximately 5 inches (8-10 inches lower than normal). While at FL180 the cabin altitude increased to 14,000 – 15,000 feet as the pressure differential decreased to 1/2 inch despite continued efforts to control it manually.

Shortly after level-off one of the deadheading ACs (AC1) proceeded to the cockpit to indicate that he and other deadheading crew were experiencing symptoms of hypoxia. He suggested the use of oxygen for the flying crew and a descent to 10,000 feet. The AC requested the Minimum Obstruction Clearance Altitude (MOCA) and the Navigator stated the highest obstacle enroute was 7700 feet. The AC understood 8700 feet and calculated the safe altitude as 13,000 feet by adding 2000 feet for the mountainous region and 2000 feet for temperature. The AC directed oxygen use for the crew and the 'Cabin Underpressurized" Emergency check was effected. After 10 minutes at FL180 a descent to 13,000 feet was initiated.

After discussing the physiological implications of the occurrence with the second deadheading AC (AC2), AC1 returned to the cockpit. On observing the 13,000-foot aircraft altitude (cabin altitude about 11,000 feet) he more forcefully queried the decision not to descend to 10,000 feet given what he saw as Visual Meteorological Conditions (VMC) down to the tops of terrain. Further discussions between the three ACs about the 13,000-foot altitude included the concern for obstacle clearance. After 15 minutes at 13,000 feet a descent to 9,000 feet was effected once the flying AC was satisfied they had passed the obstacle.

Photo by Mr. Mike Reyno / Skytech Images

Due to adverse weather at Eureka and consultations with the other ACs no approach was attempted at Eureka and the aircraft returned to Thule at 10,000 feet. AC2 offered to fly the approach into Thule for the First Officer (left seat) who had reported possible symptoms of hypoxia. After the AC's assessment of the options the assigned crew remained in their positions for the approach and landing with AC 1 remaining in the cockpit as a safety measure. A physiological event was declared to ATC.

On arrival in Thule the Airlift Control Element (ALCE) Commander's staff met with the three ACs to review the incident and all three crews were directed to the hospital for a medical assessment. After consultation with a Wing Flight Surgeon the medical grounding was to be limited to 24 hours if no further symptoms were exhibited. A second 'lessons learned' meeting was held that evening for all 15 crew members involved.

It is estimated that approximately 10 minutes was spent above 13,000 feet cabin altitude and another 15 minutes at or above 11,000 feet cabin altitude. Only one of the flying crew indicated that he may have experienced symptoms of hypoxia while 8 of the 10 deadhead crew reported experiencing symptoms

It has been determined that the cargo compartment air conditioning turbine failed 10 hours after installation (normal overhaul time is from 1350 to 1800 hours).

The follow-on investigation will assess the expediency of the flying crew's actions, Crew Resource Management (CRM) issues of the flying crew and between the three crews, maintenance issues and the possibility of wider aircrew community acceptance of flight above 10,000 feet with out the use of oxygen. ◆

Good Show

Sergeant Gerry Slater

Sergeant Slater was driving a forklift along the aerodrome vehicle corridor when he observed a civilian Fairchild Merlin aircraft taxiing with a piece of fabric hanging from the right wheel well. The aircraft had recently loaded passengers and was taxiing awaiting take off clearance. Sergeant Slater immediately contacted air traffic control and requested that the aircraft be halted. After receiving clearance from ground control, Sergeant Slater drove his forklift out to the aircraft and using hand signals instructed the aircrew to apply brakes and idle engines. He then approached the aircraft and removed a piece of rubber impregnated fabric that had been hanging from the wheel strut. The aircraft returned to the ramp area and Sergeant Slater handed the piece of fabric to a servicing technician.

The company maintenance department indicated that the material was a quilted insulation support for the hydraulic lines in the top of the landing gear compartment. The design of the undercarriage of the Merlin is such that when the gear is lowered the bay doors are closed. The potential for a fault to develop, unbeknownst to the pilots, in the gear compartment was very high.

Sergeant Slater's outstanding attention to detail and immediate and professional actions prevented a potentially disastrous accident. *Well done.* ◆

For Professionalism

Corporal Carl Schouten

During his inspection of the rotor head area of a Griffon helicopter prior to a check flight, Corporal Schouten noticed a black residue around one of the bolts that holds the swashplate support assembly to the top of the main transmission. Although the bolt was lock-wired closer inspection revealed that it could be moved by finger pressure. Corporal Schouten immediately notified the appropriate maintenance authority.

A local special inspection was initiated and six additional aircraft were found to have bolts that were not torqued to the specified value. Information was passed to higher headquarters and a fleet wide special inspection was issued.

Corporal Schouten's professionalism and attention to detail identified a serious flight safety hazard. *Well done.* ◆

Captain Martin Pesant & Master Corporal Claude Dallaire

While performing a post maintenance test flight on a Griffon helicopter, Captain Pesant noted a problem with the throttle rigging. Movement of the throttle past the bounce cushion setting produced a significant increase in RPM beyond one hundred percent. He contacted the manufacture, but was informed that the condition was normal. Not satisfied with the answer he received; Captain Pesant enlisted the help of Master Corporal Dallaire to investigate further.

Master Corporal Dallaire quickly confirmed that there was indeed a problem. An increase in engine speed within the cushion was the result of improper rigging. A local special inspection revealed eight similar examples – all of which were repaired within forty-eight hours. The maintenance authority was notified and the fleet was surveyed.

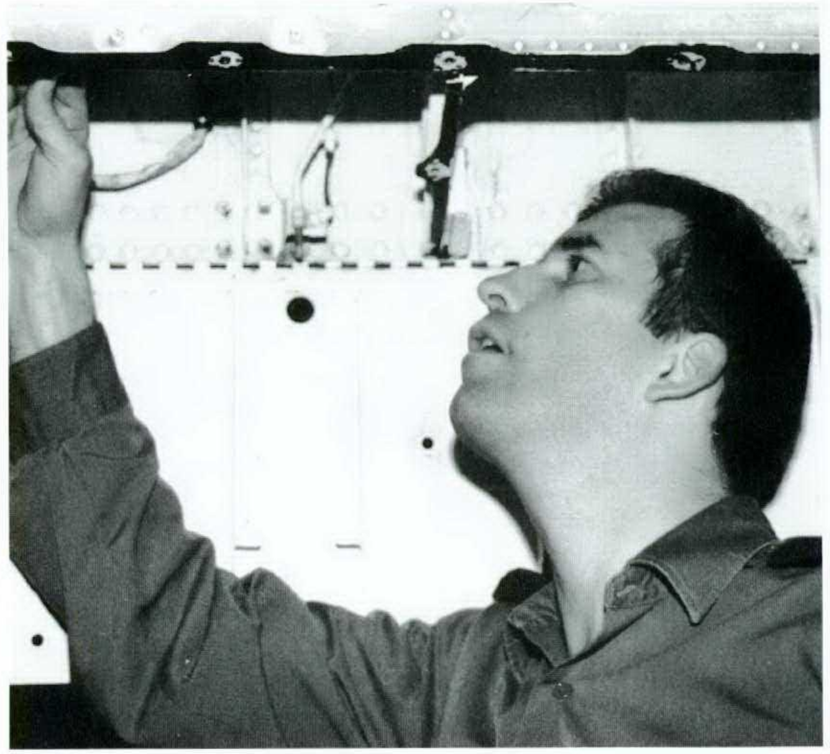
Although not serious enough on its own to cause an accident, the condition had the potential to be a link in the accident chain or at least to cause expensive repairs and aircraft unavailability. Captain Pesant and Master Corporal Dallaire's perseverance and dedication corrected an insidious aircraft unserviceability. *Well done.* ◆

Corporal Marc Fréchette

Corporal Fréchette was tasked to carry out a functional check of the flight controls of a Hornet aircraft. As he connected the hydraulic test stand he noticed an unusual piece of debris hanging out of the drain hole of an adjacent access panel. Instead of simply removing the debris, Corporal Fréchette decided to further examine the area in an attempt to determine the origin of the material.

Corporal Fréchette opened two other access panels and discovered dried and scorched pieces of Viton coating. A further in-depth investigation revealed that the high-pressure compressor borescope inspection plug had not been secured. High temperature compressed air was being exhausted into the access panel cavities.

The engine bay area is normally inspected only during engine related maintenance or periodic inspections. Corporal Fréchette's diligence and professionalism eliminated a potentially serious flight safety hazard. *Well done.* ◆



Corporal Steven Rheaume

During work on an Aurora consolidated corrosion check, Corporal Rheaume noticed that arcing had occurred between the wire bundle originating from a fuel boost terminal board and the flap access panel. Further inspection by Corporal Rheaume revealed that the panel's inboard rib was burnt approximately a quarter inch in depth and required repair. Two wires were completely burned through and all wires associated with the assembly had to be replaced.

After identifying the situation to his supervisor, Corporal Rheaume further researched the problem. He discovered that the locally manufactured panels had higher ribs – causing them to chaff against the wire bundle. A local special inspection was initiated and one other aircraft was discovered to have the same fault.

Corporal Rheaume's professionalism and attention to detail eliminated the potential for an explosion caused by fuel dripping onto bare electrical wiring. *Well done.* ◆

Corporal Kendra O'Neill

During the course of her duties, Corporal O'Neill discovered an apparent discrepancy in the MIL SPECS of an item. Two different types of aviation oils had been identified under the same NATO stock number. Corporal O'Neill immediately contacted local units and the appropriate Item Manager.

The Item Manager ordered a national stock check. The check revealed that numerous other units had the two types of oil listed as a single item. The situation was resolved, and both types of oil are now identified under separate NATO Stock Numbers. The MIL SPECS of the items were also changed to eliminate the opportunity for further confusion.

The unintended use or mixing of aviation lubricants has lead to tragic accidents. Corporal O'Neill's dedication and professionalism eliminated a significant flight safety hazard. *Well done.* ◆

Corporal Rob Konkin

Corporal Konkin was preparing to complete a routine filter change on a bowser when he noticed that the inside of the filter housing was covered in a soot-like substance. Considering the condition unusual, and suspecting a fuel or fuel filter related problem, Corporal Konkin contacted the manufacturer of the vehicle. He was informed that the situation was caused by a contained combustion inside the filter housing.

Further investigation revealed that a procedure had been developed to rectify the problem, but it had not been implemented. Subsequently, all locally operated vehicles were inspected and modified to allow for gravity fuelling instead of pressure fuelling. A maintenance directive was re-issued and several other units were discovered to have unmodified bowsers.

Corporal Konkin's professionalism and diligence eliminated a critical, and potentially fatal, safety hazard. *Well done.* ◆

Master Corporal Joceylyn Chagnon & Corporal Chris MacNeil

During a pre run-up inspection of a Silver Star aircraft, Master Corporal Chagnon noticed a minor restriction in the movement of the aileron control system. Even though the aileron was capable of full movement, and the aircraft was required for a mission, he decided to investigate further and consulted Corporal MacNeil. Together they proceeded to attempt to identify the source of the problem.

Relying on his sense of touch, Corporal MacNeil was able to detect some binding forward of the aileron hinge line as the system was cycled. After advising their supervisor, Master Corporal Chagnon and Corporal MacNeil removed the aileron and discovered that the aileron counter weights had been rubbing on the electronic warfare coaxial cable and shielding conduit. The clamping of the coaxial cable and the shielding conduit were both heavily damaged.

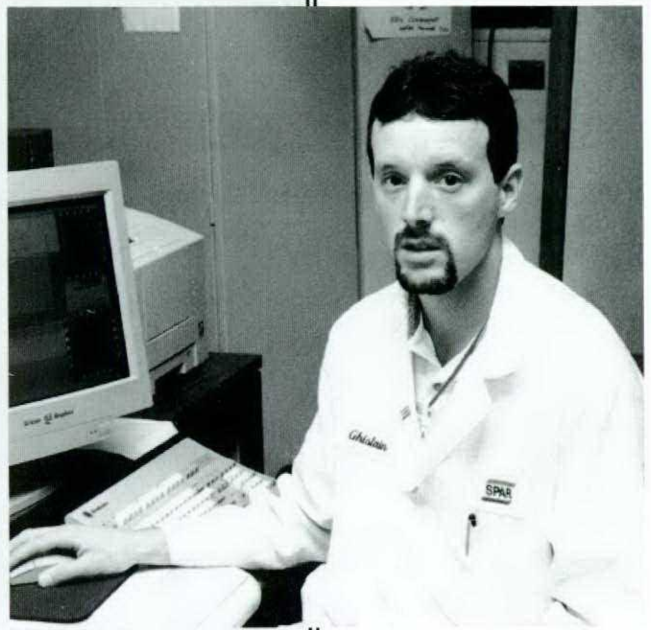
Master Corporal Chagnon and Corporal MacNeil's professionalism and resolve eliminated a potential loss of aileron control and a serious flight safety incident. *Well done.* ◆

Mister Ghislain Déry

Mister Déry, an avionics technician working for SPAR Aerospace, maintains 3 Wing's Hornet simulator. Mister Déry was assisting at the instructor's console when an emergency situation was presented to a pilot that eventually resulted in the loss of the aircraft. Although initial de-briefing pointed to a simulator fault, Mister Déry was not convinced and decided to investigate further.

Research in the simulator showed that if the right-hand electrical bus was not receiving power, and was then isolated by the GEN TIE, the emergency instrument lighting no longer functioned and the horizon information on the DDI was inaccurate. Concerned that this critical situation would manifest itself in an actual aircraft, Mister Déry contacted various interested sections and arranged for a ground run. The experiment confirmed Mister Déry's suspicions. A software trouble report was raised and the fault was corrected.

Mister Déry's professionalism and dedication eliminated a potentially disastrous flight safety hazard. *Well done.* ◆



Master Corporal Tim Schall & Corporal Dave King

Master Corporal Schall and Corporal King were tasked to troubleshoot a generator and voltage regulator snag on a Silver Star aircraft. While replacing the aircraft generator, they discovered a burnt wire in the loadmeter circuit – a sub-system not part of the original snag. The confined space of the engine compartment had obstructed the view of the wire such that it could only be seen from a specific angle and would not have been noticeable during routine maintenance.

Master Corporal Schall and Corporal King carried out a further investigation and discovered three other badly damaged wires. The damaged wires were part of a wire bundle that is routed underneath the fuselage main fuel tank. Working extremely long hours in cramped conditions, the two technicians spliced and rerouted new wires from the engine compartment to the cockpit. The aircraft was then checked serviceable for a ferry flight to home base.

The professionalism and initiative displayed by Master Corporal Schall and Corporal King most likely prevented a disastrous in-flight fire. *Well done.* ◆

Corporal Albert Camphuis

Corporal Camphuis was completing routine maintenance on an aircraft arrestor system and observed what appeared to be numerous small scratches on the brake assembly. The brake assembly had recently been shipped from a civilian overhaul facility with the proper supporting paperwork attesting to its serviceability. Despite evidence to the contrary, Corporal Camphuis assessed the scratches as abnormal and proceeded to investigate further.

Corporal Camphuis determined that the scratches were structural cracks in the brake unit. Several additional brake units were discovered to have the same fault. The flaw could have resulted in the catastrophic failure of the braking system during an aircraft recovery.

Corporal Camphuis's initiative and professional actions eliminated an insidious flight safety hazard. *Well done.* ◆

Corporal Tony Savard

The pilot of a Mooney M20 aircraft was unable to land at Halifax in IFR conditions owing to an inability to track the localizer because of an unserviceable directional gyro. With only forty-five minutes of fuel remaining, the pilot was issued a clearance to Greenwood for a PAR approach. The pilot, now clearly agitated, was unable to maintain altitude or heading assignments.

Aware of the aircraft's low fuel state, Corporal Savard switched the PAR from Runway 31 to Runway 26, thereby minimizing the flying time for completion of the approach. Corporal Savard took control of the aircraft seventeen nautical miles southeast of Greenwood, and in a calm and reassuring manner explained PAR procedures to the pilot who had never flown that type of approach. Corporal Savard's encouraging manner gained the complete confidence of the pilot who was then able to fly his aircraft without heading and altitude deviations. The pilot completed the PAR approach and landed safely with ten minutes of fuel remaining.

Confronted with a rattled pilot, flying an aircraft with unreliable equipment and a dangerously low fuel state, Corporal Savard demonstrated remarkable poise. His professional and skilful handling of the emergency prevented the loss of an aircraft and possibly the loss of a life. *Well done.* ◆

Captain Jimmy Hrymack & Captain Pat Pelletier

Captain Pelletier and Captain Hrymack were conducting a clearhood mutual training flight in the local training area. When the throttle was retarded to idle, to simulate a flame out, the aircraft experienced an increase in thrust and the engine RPM rose to 104 percent. Further throttle movements produced no engine response. The aircraft was turned towards base in preparation for a forced landing.

After confirming that they were indeed within gliding range of the aerodrome, the crew shut down the engine. A pre-ejection check was completed and all unnecessary electrics were turned off to conserve power for landing gear extension. The crew then executed a flawless profile and dead-stick landing.

Captain Pelletier and Captain Hrymack's calm and professional actions when faced with a highly unusual emergency scenario saved a valuable aircraft. *Well done.* ◆

Corporal Yves St-Martin

Corporal St-Martin was assisting with the special inspection of a Hornet aircraft. While working in the vicinity of a horizontal stab actuator, Corporal St-Martin remembered a previous problem with the servo and decided to verify the installation of the actuator. Although hindered by the extremely confined area he was able to confirm, through the use of a mirror and a flashlight that there was no washer on the actuator's anchor point.

The washer was supposed to hold the bushing of the forward anchor point in place. Without the washer, the enormous force generated by the actuator could dislodge the attachment point causing serious damage to the servo and flight control abnormalities. The squadron subsequently initiated a complete check of its aircraft – with no further faults found.

Corporal St-Martin's professionalism and exemplary attention to detail eliminated a potentially critical unserviceability. *Well done.* ◆

For Professionalism

Corporal Rick Pilon

A student pilot had completed a pre-flight inspection on a Tutor aircraft in preparation for a Basic Clear Hood test. As the student prepared to start the aircraft, Corporal Pilon removed the chock from the left main wheel. Glancing at the landing gear assembly, Corporal Pilon noted that one of the bolts that hold the brake onto the wheel looked unusual. Further investigation revealed that fully half of the retaining bolts were loose.

Corporal Pilon immediately relayed his findings to the pilots and the aircraft was shutdown and declared unserviceable.

Corporal Pilon's exceptional attention to detail while performing a routine task prevented a potentially dangerous situation from developing. *Well done.* ◆

Tell me a Story

There's a story going around the CF about a pilot who got his head stuck in a cockpit window while flying a helicopter. That story is not true. It happened on the ground before we went flying and it was my helmet that got stuck not my head.

Some time after that incident I ran into a stranger at the Saskatoon airshow. She said to me "I know you; you're the guy with the head...". On another trip I went to NAS North Island and met a pilot with the USN who asked me to see if the windows on their helicopters were big enough for me. It seems that everywhere I go the story has beaten me there.

I'm also the co-pilot from the Labrador that ditched near Comox after a generator bearing seized, heated up, and scorched nearby components – filling the cabin and cockpit with acrid smoke. None of the crew had any idea, at the time, that it was a generator bearing that caused the problem. If we had, it may not have changed any of our actions, but it is important to have as much information as possible.

As it turns out, those bearings have seized many times in the past. In fact it even happened at the same unit a few years before I arrived. I didn't hear of the past occurrence until after the accident.

I asked myself why the helmet-in-window story quickly spreads throughout NATO when reports of possible problems with an aircraft component don't make it to the aircrew concerned? We were all up to date in reading AIF's, flight safety occurrences, and the "read and heed" file. Our flight safety programme has withstood the scrutiny of the flight safety system. Reports on the previous occurrences were made; they just didn't seem important enough to the people telling the stories or to those listening.

It turns out that the previous occurrences of bearing seizure were minor in comparison to ours. The flight safety system is inundated with minor occurrences for every aircraft type – this is necessary to establish trends. Since we don't know which minor occurrences will in the future turn out to be significant we must know about each incident. Reading summaries isn't enough, but reading all the reports is quite boring. That's a dilemma.

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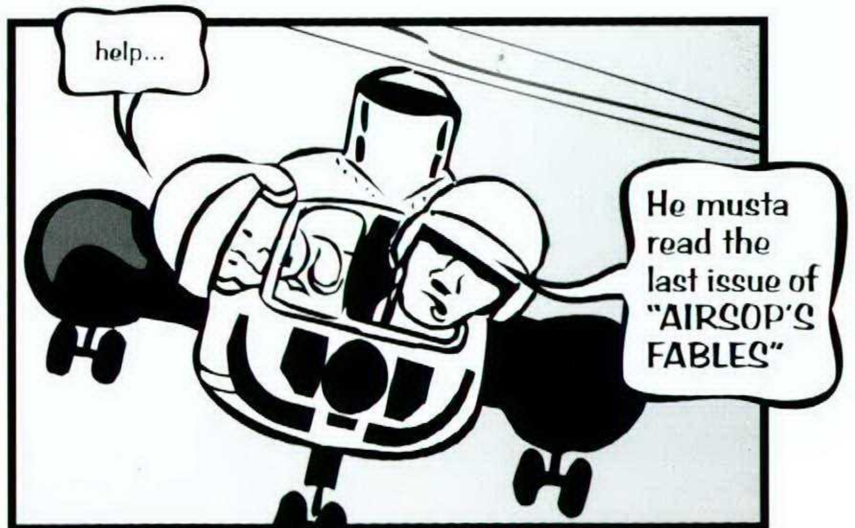
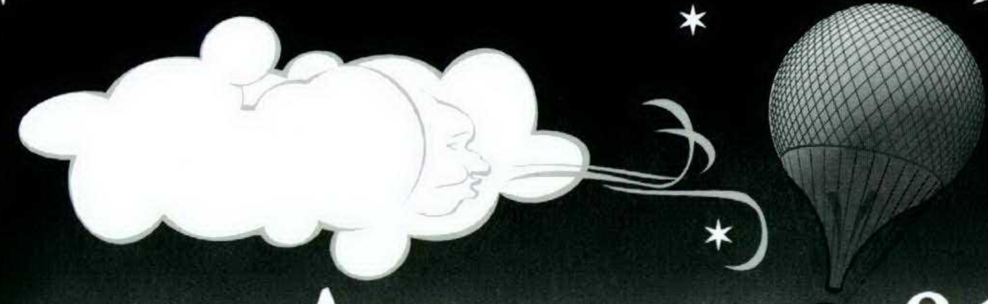




Airsport 1861:
Balloon Ascent From Cremorne

From a privately printed account by Arthur P. Vivian, born 1834, died of old age 1926.

A balloon was arranged to ascend from Cremorne on the 24th July: this was the second of the 'aristocratic fetes' in aid of the Spitalfields weavers. Noel Anderson and myself, anxious to get seats, took care to engage places about a fortnight before, and paid a deposit of £1 on the whole sum of £5.5s each. The morning of the day was anything but agreeable: cloudy, blowing very fresh, and every appearance of rain; the ascent was to have been made at 6:30 pm, but at 4 o'clock we received notes to say that the ascent was put off on account of the unpropitious state of the weather. About this time there was a gleam of sunshine, and being both of us were anxious to go if possible we started out for Cremorne in case there should be any alteration, and an ascent still be made.

When we got there we found the aeronaut, Mr. Lythgoe, had left the gardens, supposing his services would not be required; but in his absence, Mr. Adams, the secretary, on the strength of the before-mentioned gleam of sunshine, had taken upon himself to give orders to commence inflating the balloon, and had sent after Mr. Lythgoe to hold himself in readiness for a start. They told us it would take about two hours filling and, it now being five o'clock, we looked toward getting away about 7 pm, two hours passed, and the balloon did not appear half full, they then talked of half-an-hour more, but these half-hours were so many that 10 o'clock arrived and yet not ready; at that time I overheard Mr. Adams inquire to some official how it was the balloon was so long in preparing, the reply was, that "he did not think Mr. Lythgoe liked going on account of the weather". Then Adams said, "Oh, is that it? I will soon set that right," and started off to Lythgoe. It was then decided that we should start immediately after the circus; accordingly at 10:30 p.m. we took our places in the car.

The wind was now blowing in very strong gusts, and the rain descending in torrents; we had come down quite unprepared for an ascent, in our usual summer London things, and Anderson had to borrow a cloak from the waiter and I one from the Fire King. Several bystanders now endeavoured to dissuade us from going, and one old gent was very energetic in the matter, but to no purpose; for at 10:45 p.m., after throwing out several bags of sand ballast, and finding we had ascending power enough, we were let loose ('hands off') and went up from amidst the admiring crowd, and the burst of blue and red lights, the band playing "Off she goes." The wind was blowing from the south-west; our course, therefore, was north-easterly, taking us right over the centre of London.

Now lay stretched out before us one of the most wonderful sights I had ever seen. Every street of the vast metropolis could be distinctly traced by the lines of gas lights; it was as if a mass of burning sparks had fallen in regular forms and shapes; the river we could easily distinguish by a broad dark line crossed here and there by double lines of light; we made out distinctly the King's Road, Belgrave Square, Hyde Park, Regent's Park, Euston and King's Cross Stations. Altogether the looking down on this mighty city, spread out below us like some gigantic fire map, was most extraordinary. We were not more than 1,000 feet above it, the street sounds were distinguishable amid a dull rumbling of carriages, carts, etc; a louder cry or a merry whistle, now and then came up to us. Notwithstanding the incessant downpour, our spirits increased as we got higher; there was something, too, jolly in sailing at this tremendous rate over all beneath us without being sensible of the slightest motion. We now began to throw out ballast, ascended up beyond the clouds, and shut out all sight of earth. The pace we were traveling must have been very rapid, as in **eight minutes** after leaving Cremorne we had passed over the suburbs of the north-east of London.

As we got into higher regions, our spirits seemed to rise proportionally; we sang choruses, whistled and hallooed in the most insane way, no doubt to the intense horror of any inhabitants of the earth beneath who heard us. I had no idea that sound traveled such a distance; no doubt owing to its having nothing to absorb it beyond the surrounding air. Here we were upwards of a mile above earth, yet a loud halloo of all of us together could be distinctly heard echoed off the earth some seconds after it had emanated from us; now and then, also, earth sounds came up to us which were most curious; the barking of some house-dog which was responded to by the whole of the fraternity in the neighbourhood; the lowing of cattle, bleating of sheep, and the striking of the villages clocks over which we passed. More ballast was thrown out, and we sailed away at a height which Mr. Lythgoe informed us was somewhere about a mile-and-a-half; here it was much colder, L. kept testing whether we were ascending or descending; for this purpose we took with us 40,000 bills, showing the attractions of Cremorne; if we left the paper below us it showed that we were ascending, but if it went above us we were descending. Having been over an hour from starting, we now began to think of once more setting foot on earth. Imagining ourselves not more than 20 miles or so from London, and that a landing could be easily affected, we commenced laying our plans, and settled that in the event of our coming down some way from a railway station, and too late for the last train to town, we should engage a fly to take us back to Cremorne before the gardens had closed. Little did we imagine what was in store for us.

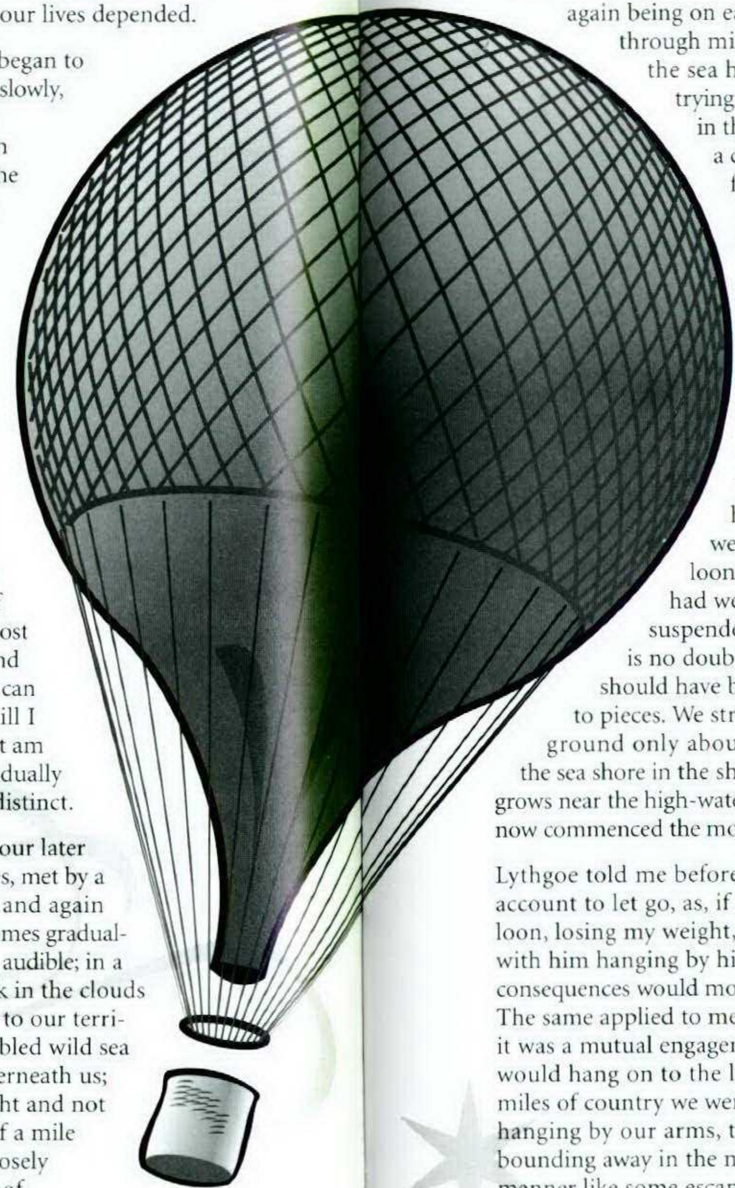
Lythgoe now told us to take possession of a bag of ballast each, and to hold it in our hands in case, on nearing the earth, we should find the nature of the country unsuitable for a landing. We very soon came in sight of the earth, and found ourselves passing at a tremendous rate over a flat cultivated country, very suitable for landing on. Everything was therefore got ready; ballast bags untied, grappling-iron got out, which was put in my charge to drop when Lythgoe gave the word, and the rope was made fast to the car of the balloon. The word was given; the grappling-iron dropped; a sudden check in our career was experienced, followed by some violent jerks; but, alas, only for a moment; the next instant a loud crack was heard, and we were once more tearing through the air at a most frightful pace, the grappling-iron rope had broken! Our situation now was anything but pleasant; flying at a great velocity, carried by a stiff breeze, without a grappling-iron, the only recognized way of making a landing. It being night also added to our peril, as we could not see over what we were passing, and there were no men about, as is nearly always the case in day time, to seize on the car immediately on attempting a landing.

I must now speak of Lythgoe's wonderful presence of mind and nerve. He seemed to think the thing well over, and said our only chance was to descend again onto the earth and run the balloon against a tree or some other sharp object and so burst her. To effect this purpose the gas valve was again opened, and we descended rapidly in sight of the earth; a bank of trees was descried at some distance on our course, and against this L. determined to run us. Going at the pace we were, this was not without considerable risk; but we had no choice and, therefore, being cautioned to secure ourselves by the ropes, and to hold each of us a bag of ballast to throw out if necessary, we awaited the result. I twisted my arms into the ropes and held the ballast with my hands, and know nothing further (being stunned by the shock which succeeded) than that when I came to myself again I found the place in which Anderson had been sitting to be **vacant**, but Lythgoe still with me. My hat squashed flat on to my head – my face bleeding from a cut on it, and my hat, face and head covered with mud, clearly proved that the car had turned over; my arms were still intertwined in the ropes and I still held the ballast bag. We were ascending at the most terrific rate, so quick, indeed, that the pain in my ears was most acute. I asked Lythgoe what had become of Anderson; he had not missed him before, but supposed he had been rolled out on coming in contact with the hedge we had encountered on our course to the trees, and which must have been my fate also if I had not had my arms linked into the ropes. He consoled me by saying that we were touching the ground at the time when he was jerked out, and that most likely he was but little hurt.

At this moment I heard a distant village clock strike twelve, and I must confess my feelings were far from enviable. Here we were, shooting up into the skies at a most awful velocity, with but little ballast, for, on examination of the car, we found that we had lost all except two small bags (amounting in all to a loss of weight of 250 lbs), therefore with every prospect of a frightful encounter on attempting to land again. Mr. Lythgoe now let out every bit of gas which was in any way consistent with safety in coming down, but still higher and higher we went. Every bit of paper thrown out only showed us the frightful pace at which we were still going up; the cold now was intense and, being soaked through by the rain, our shivering literally made the car **tremble**. We took with us at starting a bottle of spirits, but this had also been thrown out in our collision with the earth. Besides the pain in my ears, I also experienced great difficulty breathing at this great altitude, such as I had never experienced before, although I had been up to 12,000 feet in Switzerland. Lythgoe calculated the greatest height we reached to be **3 1/4 miles or about 17,000 feet**.

I cannot describe the awfulness of my feelings through the terrible hour-and-a-half which now followed – what ages it seemed! Never expecting to set foot on earth again, it comes before me now, and will, I expect, to the end of my days, like some frightful nightmare. Onwards we swept, through masses of clouds, a vast strata of vapour spread out beneath us like some gigantic sea; the moon occasionally endeavouring to cast a sickly light over it, but quickly again enshrouded in darkness, a most deathlike silence prevailed, broken only by the flap of the silk of the balloon which sounded in the rarefied atmosphere like the report of a pistol, or by our own endeavours to talk, which, however, were very few, as we both knew we had severe work before us on which our lives depended.

At last slowly we began to descend, but very slowly. After some time earth sounds again became audible; the barking of a dog, the bleating of sheep (I wished myself one of them). But now another sound predominates over all. I feel sure I have often heard it before, and convey my fears to Lythgoe that it is the sea, the low moaning and grumbling of the ocean. He almost gets up a laugh, and replies that there can be no sea near. Still I feel convinced, but am relieved by its gradually growing more indistinct.



A quarter of an hour later the balloon rotates, met by a contrary current, and again the moaning becomes gradually more and more audible; in a short time a break in the clouds beneath discloses to our terrified gaze the troubled wild sea immediately underneath us; the shore is in sight and not above a quarter of a mile distant, and on closely watching the line of breakers, we made out to our inexpressible relief, that we were approaching them obliquely. We were, therefore, returning inland from over the sea, and must have been out some miles when the cross current met us which brought us shorewards – an almost inconceivable chance!

Lythgoe now determined, even at the risk of falling too heavily on the earth, the moment we were over the land to let out more gas and descend at once. He told me to prepare myself for a very severe shock and to get off the car and hang by the ropes above, so as to take off the jar as much as possible. I must say now, having done this, I looked forward to coming down, however severe the shock might be, with pleasure at again being on earth. The sail through mid-air and over the sea had been so very trying that I rejoiced in the prospect of a change, even if for the worse.

Down we came rapidly, hanging by the ropes; the car struck the ground with a frightful bump, which was conveyed partially to us even hanging as we were from the balloon above us, but had we not been thus suspended, I think there is no doubt but that we should have been smashed to pieces. We struck first the ground only about 20 yards from the sea shore in the short grass which grows near the high-water mark. And now commenced the most awful struggle.

Lythgoe told me beforehand on no account to let go, as, if I did, the balloon, losing my weight, would ascend with him hanging by his arms, and the consequences would most likely be fatal. The same applied to me if he let go, so it was a mutual engagement that both would hang on to the last. Over two miles of country we were thus dragged hanging by our arms, the balloon bounding away in the most frightful manner like some escaped monster, and going at a rate of perhaps 30 miles an hour, driven by the wind, which was now blowing a gale. Some of the first bounds after landing were most terrific, two or three hundred yards each time, and ascending between 80 and 100 feet. Sometimes I was landed on my back, the next time on my side, my arms twisted in every conceivable way. How we stood it so long I cannot imagine. Once we were dragged through a salt water dyke, then out again, and bounded on in our terrific course. Sometimes we were within a few yards of a gate, and once not far from a wood. Had we fouled anything hard, hanging as we were and going this awful pace, we must have been literally smashed.

Lythgoe's pluck and presence of mind now came in most wonderfully. He had secured the valve line to one of his hands; it was, therefore, kept open by the weight of his body, and the balloon consequently kept getting weaker, the bounds were less formidable, and we kept dragging along the ground a great deal more than we did at first. Every now and then I could hear Lythgoe's voice, "Hold on, hold on!" But human arms could not bear it much longer. I felt mine swelling tremendously. At last I heard Lythgoe halloo out faintly, "Let go, but together – legs clear." I endeavoured to feel if my legs were caught by anything, but feeling nothing replied, "When?" "Now," was his answer, and instantaneously we both let go. We were dragging the ground at the time, and my legs were touching.

After a series of tumbles I found myself on my back, but being dragged by something around my neck it was my Scotch cloak caught in the netting of the balloon. I wrenched at it violently, and it came off me, and fell out a few yards further on. On recovering myself a little, I found Lythgoe close by me, comparatively unhurt, though shaken and bruised as, indeed, I was myself; but he had suffered more about the chest.

We now saw the balloon run against a windmill about 100 yards further on, and endeavoured to follow it; but between us and it was a broad dike, which neither of us could manage in our present state. Had we been still hanging on when came in contact with this windmill we must have been very much injured, if not killed. I asked Lythgoe, afterwards, what made him decide on letting go when he did. He said he saw some large white object in front of him, which he thought was a house, and that it was then our only chance to let go – as, indeed, it turned out. How we passed over two miles of country, being dragged at this most awful rate, without coming in contact with anything hard, is most marvellous.

Here we were, then, in the middle of the night, exhausted and shaken to a degree, without hats, and almost without clothes, on some marshy land near the sea coast, but where, we had not the slightest idea. I must say I looked upon all these miseries as trifles now that we were on terra firma again, on which, certainly, at one time, I never expected to be alive. Which way to go was of perfect indifference to us; so we turned our steps in an opposite direction to the dyke. We encountered another dyke, but less formidable. I managed to get across it, but Lythgoe, being more exhausted, went right into the middle; and had difficulty in getting out at all, but at last, to our great joy, we saw some chimneys against the sky. One more dyke had to be crossed, and the door was reached of a poor cottage. I knocked violently, and after repeating this several times, a window above us was opened, and a man's voice demanded what we wanted; the first thing was to ask admittance, which was replied by asking where we came from? "From a balloon," was the answer, upon which the window was shut with a bang.

This, however, would not do, left to die outside of cold, so I knocked loud again, and the window at length was opened. This time, after questions had been replied to, the guidman seemed half disposed to come down to our assistance; but I heard his 'better-half' say to him, "Don't go down John." I hallooed out, "Now Missus, do let John come down; we are no robbers, and we won't hurt him." At last we heard him coming down the stairs, the door was opened, and John appeared with a candle guarded by Mrs. John, in case of treachery. We found it a labourer's cottage (10s. per week, a wife a four children, so not much to eat or drink), not far from Southwold, on the easternmost coast of England, the hour being 2 o'clock in the morning. Three hours and a quarter we had taken from Cremorne.

My companion was in a most exhausted state, his appearance not improved by the black mud of the dyke into which he had fallen. The poor people, now that they saw our state and believed our story, were most kind, and did everything they could to make us as comfortable as their means would allow. They made us a fire and dried our clothes – we being arrayed in suits of labourers. At about 4 a.m. we sallied forth in these to see if we could ascertain anything about the balloon.

Finale

Having retraced their course and discovered the debris of the car and Vivian's umbrella, they returned to the cottage at 6 a.m., found that there was a train from Darsham to London at 7:20 a.m., and arranged with a country gig to take them the six miles to the station. They arrived in the city at 10:30 a.m. "without hats and almost coats to the great astonishment of bystanders."

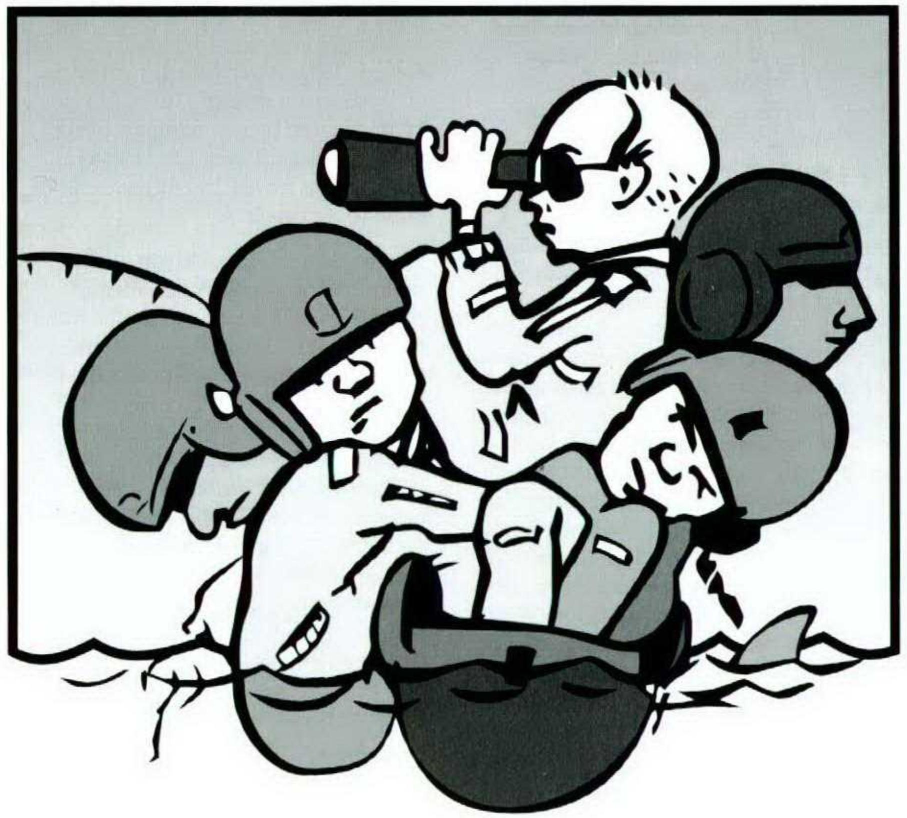
In London they met up with Anderson, who had been thrown out on his head into a field of beans. He had also found a cottage where the labourer said that, when returning home in the dark shortly before, he had heard unearthly shouts emanating from the clouds, and become sensible of a gigantic body rushing with great velocity past his ear. Anderson's train arrived in the city at one o'clock in the afternoon.

Vivian also wrote a technical note in 1861:"I have come to the conclusion that a balloon is at present a most unmanageable thing even to the experienced, and if I went up again I would have a double set of grappling irons and ropes complete.

It struck me also that in addition to the present valve…there ought to be a far larger one which could be opened immediately she touched the ground… Also, I think the strain comes to quickly on the grappling iron rope should it catch at once. There should be some means of taking the strain off such as a buffer spring...which would give a little if caught up suddenly. However, I cannot see ballooning can ever be brought to any real practical use from the enormous difficulties to steer a desired course." ◆

Tell me a Story

(Continued from page 24)



We need to absorb the information since it may prove to be vital, but the endless scanning of reports is a poor method of learning. Similarly, sitting through a dull flight safety lecture will quickly kill off any caffeine high and thwart any attempt at learning.

Where does my helmet fit into all of this? First of all, the crewmembers of the Labrador can feel more secure in knowing that my helmet can be used as an emergency life raft for the five of us. Secondly, the story about it getting stuck, an uneventful occurrence, was distributed rapidly and remembered. Why? It's a funny story. Both the storyteller and listener found it interesting. This is how we can tackle the problem of passing flight safety information effectively. Make it interesting!

Don't just make reports available. Don't just fill the overhead with stats. Present the information, encourage discussion, make it interesting!

One more thing – quit making jokes about my helmet. ◆

Captain Matthew "Head" Parsons

The Trials and Tribulations of Harvard 435

A bit touchy on the rudder, eh Bloggs!

Don't worry Bloggs we'll get you out in the spring.

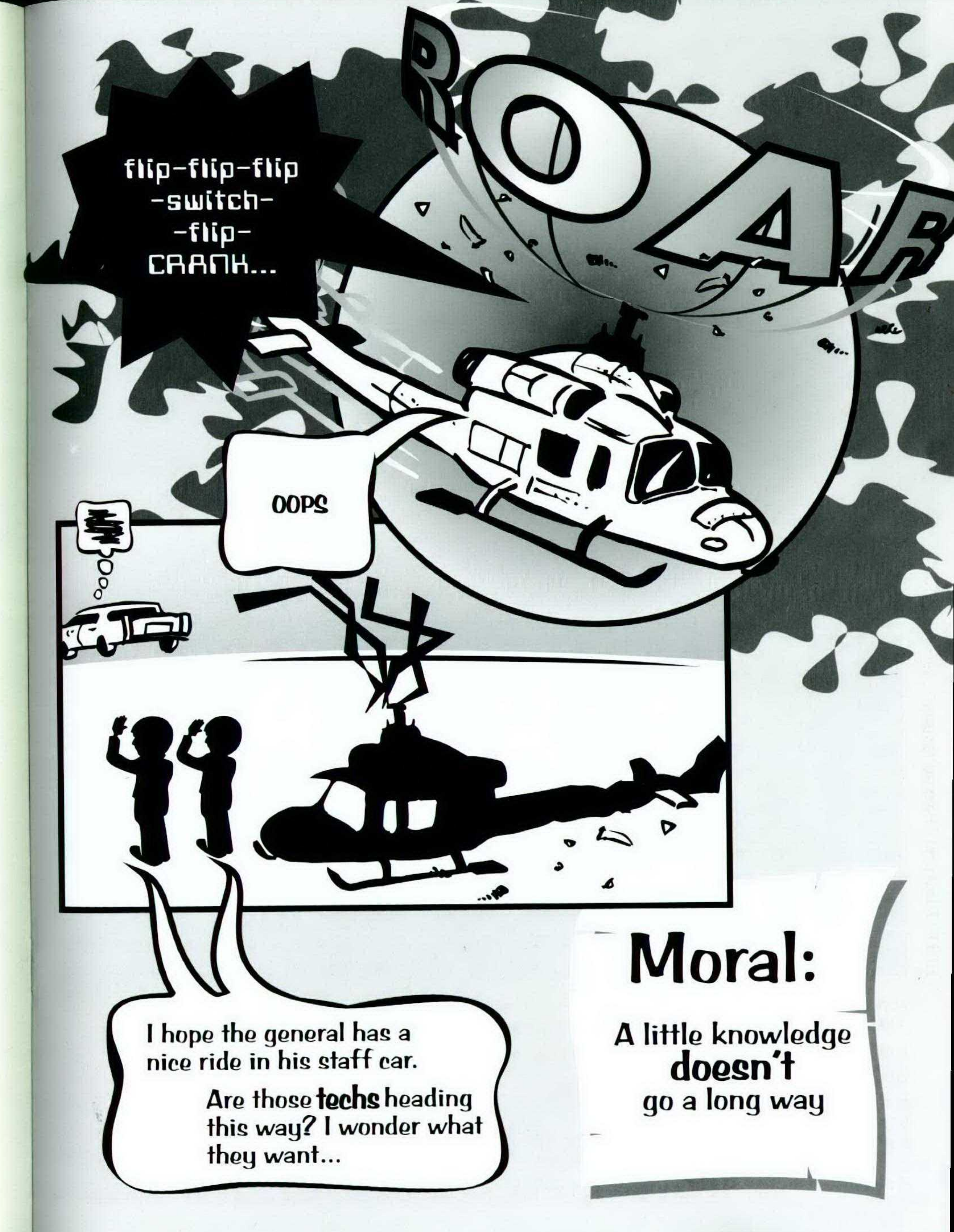
You can come out now Bloggs.

All right Bloggs, you seem to have the direction part figured out, now how about working on the distance thing.

Flip, Flip, Switch, Crank, ROAR
or
Everything You Wanted to Know About Impressing VIP's*

AIRSOP'S FABLES

* ... and Techs, too.



Moral:

A little knowledge **doesn't** go a long way

Flight Safety Word Search

By Captain J.J.P. Commodore

B	P	I	H	S	R	E	D	A	E	L	G	O	A	L	S
W	R	B	E	C	N	E	U	L	F	N	I	T	I	D	E
T	O	E	L	E	V	O	H	S	Y	D	E	S	O	L	C
N	F	H	I	G	H	E	R	T	D	X	G	E	K	L	R
E	E	A	S	S	T	A	N	D	A	R	D	V	R	A	O
M	S	V	I	L	A	R	O	M	G	E	A	A	A	U	F
E	S	I	A	L	O	O	P	O	P	M	W	W	M	D	N
G	I	O	C	O	E	L	O	I	N	I	A	E	E	A	E
A	O	R	T	P	E	D	L	A	R	T	R	N	R	R	Y
N	N	T	I	M	E	O	E	C	N	A	D	I	U	G	N
A	A	T	O	U	Q	U	A	R	T	Z	P	M	R	E	I
M	L	E	N	U	E	C	R	U	O	S	E	R	G	R	T
D	I	R	E	C	T	O	R	A	T	E	O	E	E	O	U
U	S	N	O	I	N	I	P	O	N	S	P	T	N	N	R
M	M	N	O	R	D	A	U	Q	S	K	L	E	C	G	C
P	U	N	I	S	H	M	E	N	T	S	E	D	Y	I	S

HINT (7 letters) "Passed Issues"

ACTION
AWARD
BEHAVIOR
CLOSED
DETERMINE
DIRECTORATE
DUMP

EDIT
ENFORCES
EPILOGUE
EXAMPLE
FAILED
GOALS
GOOD

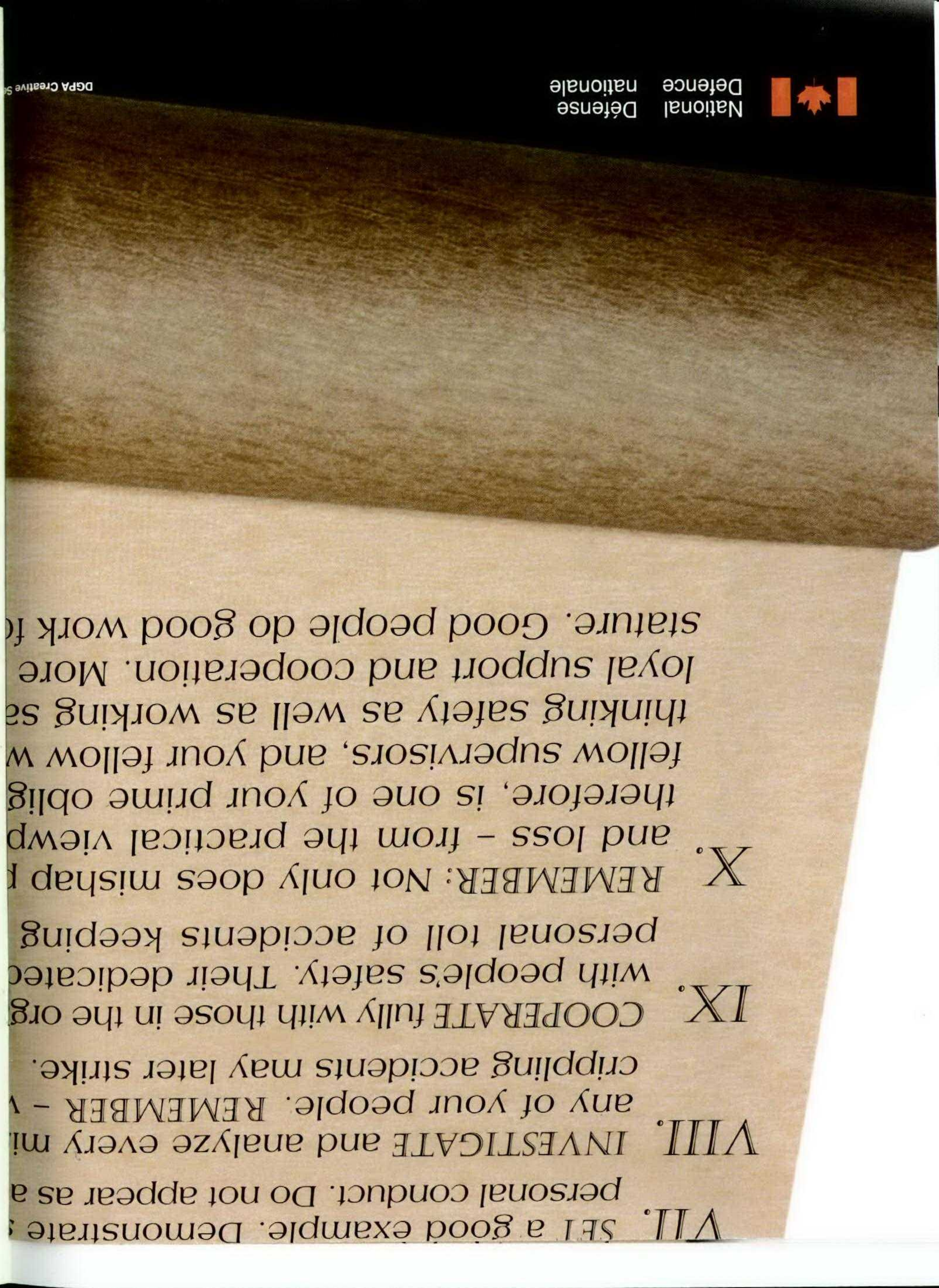
GRADUAL
GUIDANCE
HIGHER
IGNORE
INFLUENCE

LEADERSHIP
LOOP
MANAGEMENT
MORAL
OPINIONS
PEDLAR
PEOPLE

PROFESSIONALISM
PUNISHMENTS
QUARTZ
QUOTA
RANK
REMARK
REMIT

RESOURCE
REWARDS
SCRUTINY
SHOVEL
SHOW
STANDARD
SQUADRON

TIME
URGENCY
WAVE
WEATHER



SUPERVISORS' TEN COMMANDMENTS OF SAFETY

I. *YOU* are a supervisor and thus, in a sense, you have two families. Care for your people at work as you would care for your people at home. Be sure each understands and accepts their personal responsibility for safety.

II. *KNOW* the rules of safety which apply to the work you supervise. Never let it be said that one of your airmen was injured because you were not aware of the precautions required on the job.

III. *ANTICIPATE* the risks which may arise from changes in equipment, methods or mission. Make use of your safety staff who are available to help you guard against such new hazards.

IV. *ENCOURAGE* your people to discuss with you the hazards of their work. No job should proceed where a question of safety remains unanswered. When you are receptive to the ideas of your workers, you tap a source of firsthand knowledge which will help you prevent needless loss and suffering.

V. *INSTRUCT* your people to work safely, as you would guide and counsel your family at home – with persistence and patience.

VI. *FOLLOW UP* on your instructions consistently. See to it your people make use of the safeguards provided. Enforce all safe practices. Do not fail your organization which has sanctioned these rules or your people who need them.