National Defence
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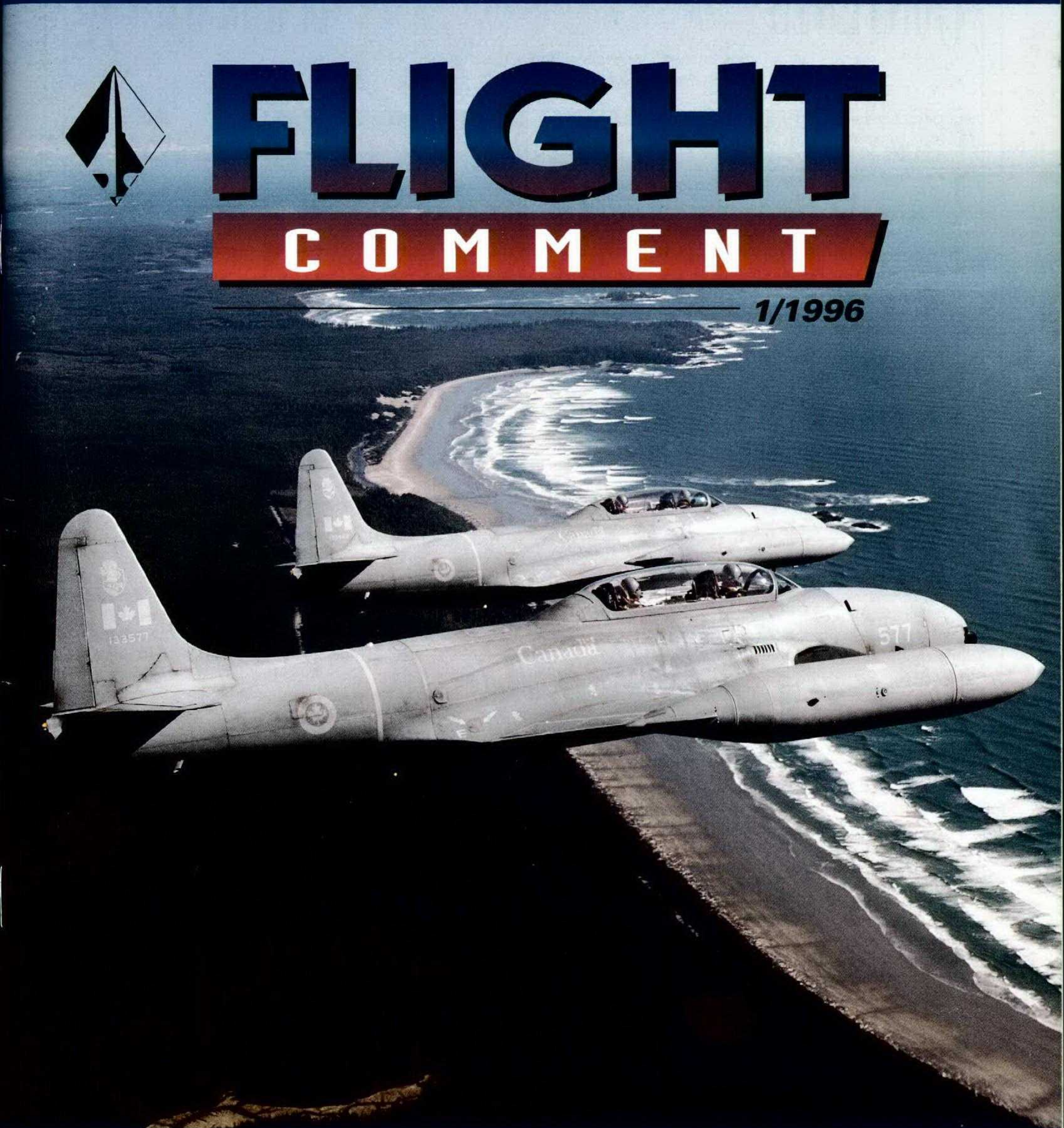
FLIGHT COMMENT

1/1996



Canada

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AS WE SEE IT

by LGen A.M. DeQuetteville, Commander Air Command and CWO R.N. Elphick, Command Chief Warrant Officer

Cpl Pete Vaudry

Cpl Dave Payne

When the Command Chief and I read the minutes of the 1995 Flight Safety Training Session, we noted the issue of poor morale and its possible effect in the rise of inattention as a cause of occurrences. The Command Chief and I see this as an important issue that needs our attention.

The principles of war state that maintenance of morale is one of the important features of maintaining an effective military. In war we have seen this proven time and again. Often in peacetime though, the effects of morale on a military's abilities as an effective fighting force are not given as much weight. This is somewhat peculiar, since morale whether in peace or war impacts the effectiveness of a force more than any other factor, bar none. In times of deep cuts, maintaining high morale can be a relatively cheap force multiplier. There is no argument, that a force with high morale works better and faster, and because of the strong sense of pride high morale generates, professionalism and the quality of the work are also very high. In Air Force terms, this often results in less accidents/incidents and therefore increased combat capability.

What is difficult to grasp is exactly how to affect morale positively. The precepts of Maslow's "needs" pyramid remain true; if one is lacking the basic needs it is difficult to achieve higher needs. With this country's massive debt and its consequent effects on DND resulting in pay freezes, no incentives, diminished job security and increased uncertainty, it is small wonder that people fear for their basic needs.

As a result of some of these factors affecting morale, many individuals feel that control over morale is outside their hands, and lays squarely with some higher ups, somewhere...

This begs the question; why, when morale as a whole is supposedly very low (Phillips study), do we find units where morale is quite good, even excellent?

It seems that morale is affected through many levels, from the CF as a whole down through the Wings, sections and individuals. Each level, by actions, decisions, and leadership influences the level below it. The reverse is difficult to achieve. The closer the level affecting morale is to your own level, the more likely your morale will be affected. A corporal's morale is affected more by his sergeant than it is by NDHQ policy. In turn, each of us also influences morale in our sphere of responsibilities or action. Morale is a global issue that each of us has an effect within our sphere of influence. This is especially true of the individual, who has the greatest influence over their own morale.

The fact that the most powerful influences over an individual's morale are the closest to their level, they are also the easiest to effect. This presupposes a favourable environment exists.

Although there is no simple recipe for improving morale, observations of small groups of individuals carrying out a task yield some clues. Some of these clues include: personnel knowing where they are going and how they are getting there; there is meaningful, tangible information about what, when and why; input from personnel into the task is sought and acted upon by the leaders; good communication exists; good work is recognized promptly; there is room for fun; individuals within the team help each other and even straighten out bad apples; the leader is reachable, visible and places needs of subordinates before their own; there is one set of rules for all; promises are kept; if word is given, delivery is assured; and there is a certain amount of stability, providing an anchor for some personal security.

These ingredients are not the complete recipe. The saying, "Everything is simple, but even simple things are extremely difficult" seems to apply. We know these things instinctively, yet it is hard to focus given all the activity going on around us. It is however, a good place to start and it must happen at all levels.

In outlining Flight Plan '97, I have endeavoured to address most of these morale affecting issues; from clarifying where we must take the Air Force, slowing the pace of change, lessening economic hardship, and improving accountability and communications.

In the end, good morale not only provides an effective working environment, it provides a force multiplier and increased flight safety. Better morale starts with each individual, at all levels. While individuals are responsible for their own morale it is up to supervisors at all levels to set and maintain the right kind of environment. As we see it. ◆

CREW RESOURCE MANAGEMENT

by LCol M.J. Dolan, SSO OT

In December 1987, a Hercules struck its right wingtip on a snow bank while attempting a circling approach in minimum weather conditions. The flight safety preventive measures indicated that this incident highlighted the requirement for improved crew coordination and cockpit discipline - Crew Resource Management (CRM).

What is CRM? From the Air Command Training Policy, we find that CRM is a concept which links leadership practices and human factors principles in the organization and control of people and their activities in the operational environment. It is important to note that "crew" includes everyone on the air operations team: ATC personnel, ground crew, load masters, flight stewards and wingmen; not just the cockpit crew. In a nutshell, CRM principles help improve awareness, advocacy, assertiveness and cooperation.

Does CRM work? It seems to have a dramatic effect. Following the adoption of CRM training by the USAF in 1985, the major accident rates for the Military Airlift Command (MAC) fleet of C5/C141/C130 fleet fell by 51%, an effective saving of 11 aircraft. In the US Navy there was an improvement of 80% in the accident rate in the A6 community alone. As statistically more than 80% of all aircraft accidents have personnel cause factors assigned to them, this improvement in accident rates is critical in a military with limited resources such as the CF.

CRM applies to everyone involved in flying operations. Central Flying School (CFS) is coordinating the CRM training for aircrew and has provided training for ATC personnel as well. 19 Wing Comox has implemented a course aimed at non aircrew, designated "Human Performance in Maintenance" and under Air Command direction CRM will be part of every basic MOC course related to aircraft operation.

As one of the key factors in effective CRM is communications, a CRM page will be available for perusal on the Aircom World Wide Web in the near future. In the meantime, if anyone has queries, inputs or observations on CRM they can contact CFS by phone, fax, E-mail or on the Internet. Addresses are: phone (204) 833-6667 (AV 257-6667); fax 833-2437; Internet cfsraven@escape.ca. ◆

AIRCOM CREW RESOURCE MANAGEMENT TRAINING POLICY

General. This policy establishes the framework to develop and implement Crew Resource Management (CRM) training for all personnel involved in the operation of CF aircraft.

Definitions. CRM is a concept which links leadership practices and human factors principles in the organization and control of people and their activities in the air operations environment. Crew includes not only the aircraft crew but also all others on the air operations team who routinely work with or in support of the aircraft crew and whose decisions impact on mission safety and effectiveness.

Training. The purpose of CRM training is to raise the situational awareness of individual crew members with regard to the effectiveness of their contributions to the group and to the mission, in areas such as: decision-making, conflict-resolution, stress management and communication. CRM training will be incorporated into all levels of training and operations for all members of the air operations team as follows:

a. **Initial Indoctrination/Awareness.** CRM will be introduced at the primary/basic level of training to establish a baseline generic knowledge of the essential elements of the CF program. For pilots, the Advance Flying Training (AFT) phase will begin to orient CRM training towards the particular mission-oriented crew environment, i.e. jet fighter, multi-engine transport/maritime patrol and helicopters. Other members of the air operations team, including ground crew and aerospace control personnel, will receive initial CRM indoctrination during their basic occupational training and follow-on training during subsequent career and technical courses.

b. **Recurrent Training and Feedback.** For aircrew, initial recurrent training will occur at the Operational Training Unit (OTU) level where CRM concepts already introduced will be practiced and evaluated. As well as constituting recurrent training, CRM at this level will allow fine-tuning and specialization of CRM concepts to the particular mission-oriented crew environment.

c. **Continuing Reinforcement.** Recognizing that learning is dependant upon continued reinforcement, CRM will be imbedded in all phases of continuation training and stressed in daily line operations and periodic evaluation.

Administration. Air Command Chief of Staff Personnel and Training (COS Pers and Trg) is responsible for establishing CRM training policy and CRM training standards. Responsibility for training and implementation of the standard within various classifications is as follows:

a. **Aircrew Training** - Central Flying School (CFS), through the Instrument Check Pilot School (ICPS), will assume responsibility for training facilitators for CRM training development and overseeing the implementation of the standards set by the COS Pers and Trg. Integration of CRM training into the Training Standard (TS) and oversight of the standard will rest in CFS Standards.

b. **Technical Training (both MOC 500 and AERE)** - Canadian Forces School of Aerospace Technology and Engineering (CFSATE) will assume responsibility for developing and incorporating CRM within the occupational training conducted at that unit, and providing the associated standards oversight.

c. **Aerospace Controller (AEC)** - Canadian Forces School of Air Traffic Control (CFSATC) will assume similar responsibilities to that of CFSATE for AEC personnel. ◆

CRM training will be incorporated into all levels of training and operations.

MOVING SHIP - LOW FUEL ! ! !

Our ship was about 50 miles from the rest of the Task Force. We were tasked to deliver people and parts to the other ships. On take off, we were advised that our ship would maintain its current course until our return (ship heading North at 10 kts). We flew our mission hoisting and delivering the people and parts. The last ship had a flight deck so we landed on. Before we took off, we were asked if we wanted some fuel. We quickly calculated that our ship 'should' be approx. 20 miles away and decided our 1 hour of fuel was good and we departed.

We started to get concerned when we were about 10 miles back from where our ship 'should' have been and we couldn't reach them on the radio. We climbed and still no contact on radar, TACAN, or radio. We turned back to the last ship. After transiting 20 minutes out, 20 minutes back and loitering for a few minutes trying to reach them on radio, we were very low on fuel. An uneventful landing on the last ship followed by refuelling, we asked them for the position of our ship - they gave it to us. Our ship had in fact gone East at 10 kts and was about 80 miles away. This taught me a few things: Always get gas when available and always get an accurate position of your ship. ◆

FOR PROFESSIONALISM

SERGEANT REJEAN ASSELIN

Sgt Asselin, a Safety Systems Tech, discovered a very hazardous situation when tasked to provide crew protection for a Buffalo flight proceeding for a night exercise. To maximize the operational/training benefits of the flight, the crew size had been increased beyond the ability to kit everyone with either an aircraft on-board smoke mask or dangerous cargo kit portable oxygen walk-around assembly. Although applicable orders state the recommended duty passenger protection is the C4 mask with the C2 canister when crew/passenger compliment exceeds on board aircraft protection capacity, Sgt Asselin's knowledge of the C4's capability made him question the validity of the directive.

After extensive research, Sgt Asselin proved the combination of the C4 mask and the C2 canister provides inadequate crew/passenger protection in case of an on-board fire. With his analysis confirmed, Sgt Asselin formally documented this critical deficiency. Failure to recognize this problem could have led to injury or death to aircraft crew or passengers in the event of a fire.

Sgt Asselin is commended for his superior professional attitude, initiative and dedication to Flight Safety. ◆

CORPORAL HAROLD MACPHERSON

While carrying out an "A" check on a Sea King Cpl MacPherson noticed that the sealant around the right aft Main Gear Box (MGB) retaining bolt was cracked and black oil was oozing from under the MGB foot. Although not specifically covered in the scope of an Airframe "A" check, he continued to investigate the problem. Subsequent checks revealed the torque on this bolt to be well below specified value. The bolt was retorqued to specifications and the remaining bolts checked for proper torque.

The MGB is a very critical airframe component and its integrity paramount to the safety of flight. Cpl MacPherson's attention to detail, perseverance and professionalism averted a potentially serious incident. ◆

MASTER CORPORAL SHANE GRENON
CORPORAL BOB WILSON

MCpl Grenon, a Radar Systems Tech, and Cpl Wilson, a Metals Tech, were tasked to remove the fin cap on an Aurora to facilitate repair of bird strike damage on the leading edge of the vertical stabilizer. While operating some 35 ft above the hangar floor, on their own initiative they inspected an area not part of their trades. During this inspection they discovered two nuts missing from the upper rudder hinge. They immediately reported the discrepancy and corrective action was taken.

MCpl Grenon and Cpl Wilson are commended for their professionalism and initiative in conducting a thorough inspection in a less than ideal location. ◆

CORPORAL GREG MAYRHOFER

Cpl Mayrhofer, an Aero Engine Tech, was conducting a preflight check on a Labrador when he noticed white specks on the trailing edges of the left engine turbine blades. While inspecting the leading edge of each turbine blade, he found that two blades appeared to have been damaged by FOD. He immediately advised his supervisor and recommended the engine be removed for a thorough follow-up inspection. The investigation revealed a severely "fodded" turbine section.

As a result of Cpl Mayrhofer's findings and the nature of the component damage, all Squadron aircraft were inspected. Three additional T-58 engines were found to have significant damage to the turbine section. An indepth investigation was carried out to determine fleet status.

Cpl Mayrhofer's alertness, perseverance and follow-up actions prevented the potential catastrophic failure of an engine. ◆

FOR PROFESSIONALISM

MASTER CORPORAL MIKE FADER

MCpl Fader, an Integral Systems Tech, volunteered to assist an Airframe Tech during a routine Primary Inspection (PI) on a Labrador. His task was to clean the oil from the aft transmission area. After finishing the main wipe-down, he began wiping off more obscure places in the aft area of the aircraft, including parts of stringers and webs that can't be seen with the naked eye but can be reached by hand. During this maintenance action he discovered four large bolts lying loose in the aft transmission area. These bolts are used to connect the #5 sync shaft with the aft transmission spline adapter.

Further investigation revealed that these four bolts had been removed during a transmission change two months previously and when they could not be found for reinstallation, they were replaced. The helicopter had since flown 120 hrs and gone through two Supp checks and four PIs without these loose bolts being discovered. MCpl Fader's attention to detail while performing an out-of-trade task uncovered a potentially dangerous FOD situation and exposed the importance of basic maintenance practices. ◆

CORPORAL MARIO GUILMETTE

Cpl Guilmette, an Airframe Tech, was carrying out a routine before flight inspection ("B" check) on a Kiowa when he noticied a restriction to movement in the rudder pedals. Cpl Guilmette immediately advised his supervisor, after which the tail rotor assembly was removed for inspection.

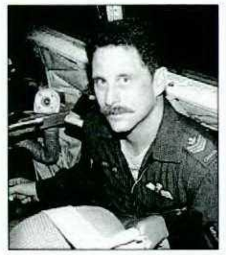
Further investigation revealed that an unidentified pin was found cocked in the tail rotor output shaft, outboard of the pitch key hole. This system is an internal part of the tail rotor flight control system. Had this problem gone unnoticed, seizure of the tail rotor flight control system could have resulted.

Cpl Guilmette had less than four months experience on the Kiowa and had just qualified the week before this discovery. As well, the functional check of the flight control is not part of the "B" check, nor was Cpl Guilmette familiar with the tail rotor flight control system. ◆

CORPORAL REGIS FRANCOEUR

Cpl Francoeur, a Flight Engineer, was conducting his pre-flight walk-around on a Twin Huey when he found the number three tail rotor driveshaft's "C" clamp bolts had backed off from their witness marks. Opening the tail rotor drive shaft cover and inspecting the bolts is not a part of the pre-flight inspection but it is Cpl Francoeur's habit to go beyond the checklist in the conduct of his duties.

Cpl Francoeur's professionalism and attention to detail in finding this unserviceability may have prevented a serious flight safety incident. ◆



SERGEANT WAYNE WILLIAMS

Sgt Williams, Flight Engineer, was conducting a pre-flight inspection on a C130 after which he elected to inspect an area not specified in the Flight Engineer pre-flight checklist. During this inspection Sgt Williams discovered a steel rod approximately 1/4 x 13 inches long in the copilot's right rudder pedal mechanism.

Investigation revealed the rod was probably used as a tool by a civilian contractor to facilitate systems rigging checks during a very recent inspection. The rod was not discovered during numerous checks and inspections by the contractor, aircrew and home unit maintenance acceptance inspection team. Had this item not been discovered, the possibility of jammed rudder/brake control existed.

Sgt Williams is commended for his exceptional professionalism in that his actions may have prevented a very serious situation and a possible catastrophic accident. ◆

THE DECIDE MODEL - STRUCTURED DECISION MAKING

adapted from Human Error Accident Reduction Training, International Safety Institute, Geis-Alvarado & Associates

The optimizing strategy of decision making enables the crew member to follow a systematic decision making process. The DECIDE model has been developed to assist you in evaluating problems and selecting the best alternatives. It is easy to remember this process because you just have to DECIDE what you want.

D - Detect Change:

You can't solve a problem unless you know it exists. Change exists when there is a difference between "what is happening" and "what is desired to happen." There is no one formula for dealing with all kinds of problems. Some require extensive research and fact finding before the true problem can be identified. Others are almost automatic in both definition and solution. The crew member, who first detects the change, clearly defines the problem, and evaluates the situation, approaches the problem in the most effective way.

Problem definition is a key part of this step. You must ensure that you are solving the problem and not simply addressing a symptom.

E - Estimate the Significance of the Change:

In this step the crew member assesses the priority of the problem by examining the facts. If the significance of the situation/problem is underestimated, our stress level will be too low and we will ignore critical information. If the situation worsens, we could be caught off guard.

If the significance is overestimated, our stress level will be too high. Then we may fixate on the problem, or at extremely high stress levels, we may become confused or panic.

It is critical that you conduct a realistic assessment of the significance of the problem.

C - Choose an Objective

The next step is to choose an objective, not an alternative. An objective is the final measure of success. It is a realistic assessment of what you wish to accomplish. You must be careful not to select an objective that is too narrow in scope nor too broad. You may also select intermediate objectives. These objectives will provide the direction you will need to get from where you are, to where you want to be. The objective you select sets the stage for the alternatives you will consider. This may be the most important step. An ill-conceived objective will affect the rest of the processes and may lead to incomplete solutions.

The DECIDE model has been developed to assist you in evaluating problems and selecting the best alternatives.

I - Identify Alternatives:

The more choices available in a problem situation, the more likely a quality solution will result. Whenever time allows, discussing the situation with other crew members will aid in generating alternatives. When time is limited, it is still important to consider more than one course of action. Remember, an alternative is only an alternative when it meets the objective selected. In other words, your objective becomes a yardstick that can be used to measure the efficacy of your alternatives.

D - Do the Best Alternative:

The crew member's job is to select the best alternative. To do this, it is necessary to look at all alternatives and create a standard against which a judgement may be based. By weighing each alternative against standards or criteria, crew members further clarify measures of success. Techniques available which may assist you in weighing each alternative include identifying significant criteria and assessing risk.

E - Evaluate the Effects of the Decision:

Evaluation provides crew members with feedback on the effects of their decisions. This in turn provides information regarding the need to adjust to additional change. If the alternative selected does not meet the objective, the problem solving process starts again.

DFS has produced a video on the DECIDE model titled "Decision Making in Single Seat Operations". It dramatizes two CF18 incidents where poor decision making led to accidents. The video may be obtained in either official language by FAX or message addressed to AIRCOM/DFS 3-4-2. ◆

IT HAPPENED TO ME

The following anecdote relates to something very simple: an instrument rating test, more commonly called a "ticket ride" in our circles. I am telling it to you so that perhaps, like me, you will realize that we are all far from infallible, and that we can get into trouble with something that seems quite routine to us.

Because the ticket ride is taken from the front seat in a CF18, this flight was planned for late on a September day to take advantage of nightfall and simulate IFR conditions, as much as possible. Since I am an ICP, and in order to make a change from the usual route, I planned the flight so that after taking off from Bagotville we would make one or two approaches at the Dorval and Mirabel airports. Ticket rides occur only once a year, so this was my chance to impress my check pilot. The interesting thing was that between us we had a total of approx. 6,000 hours of flight time. How could anything go wrong?

After a standard briefing and normal preparation, the flight was about to begin. Once the startup was completed, the routine preflight checks began. Heaven knows I gave it my all. For fear of boring my instructor, I had warned him that if I talked too much he had only to tell me, and I would try to be quiet, but that did not happen. I think my explanations were very detailed: I went over what I would do in such and such a case, my plan of attack, what would happen in case of a breakdown, and so on. Once I had finished programming my systems and obtained taxi clearance, we headed for the runway. The distance from the parking area to the runway being used that evening was fairly short and without hurrying, in two minutes the aircraft was lined up and ready for takeoff.

During those two or three minutes I continued my harmless chatter, obtained my IFR clearance, completed the dynamic checks of my instruments, changed frequency and asked the Tower for take-off clearance. I really

CF18 on the takeoff roll.

wasn't trying to act "cool"; it was just that everything seemed to be going very well. While still chattering away (inappropriately, as I now know), I lined the aircraft up on the centreline, changed to departure frequency, performed the usual final checks, cut in the afterburners and lifted my instructor and our CF18 into the starry Saguenay sky.

Just a few seconds after I had cut out the afterburners, a voice on departure frequency made an unusual request: "The Tower request you return to their frequency". At that instant, I knew sensed that something was amiss. When I said the words "Bagotville Tower, Saguenay 53", the reality of what I had just done made me shudder with fear. I had just taken off without clearance. Not only had I missed everything the Tower had told me when I lined up, but my chattering served as the perfect shield so that my instructor had not noticed anything. And that is not all.

The clearance I received was something like "Sag 53, taxi to position and hold. Aircraft taking off on Runway 18". By some incredible luck, the civil carrier had taken an extremely long time to line up and begin his roll, to the point that the Tower's attention was focused on him. What was even more fortunate was that the noise of my engines and the light from my afterburners alerted the Tower and the carrier pilot to my blunder. The carrier pilot had only to apply his brakes before continuing his roll.

How had I got into this situation? With all the good or bad luck (?), this story could have turned into a tragedy. This event is obviously yet more proof that when we become too comfortable, we lose our alertness. Despite the appearances, this flight was far from routine. Since I have been flying fighters, doing a detailed briefing on all my current and anticipated actions for my backseater have been the exception rather than the rule. That evening, my situational awareness was far from 100%. I had ignored an important piece of information because of a briefing which should have been done in a quieter place than on the takeoff runway.

Ladies and gentlemen, whatever your role or task, an incident like the one that happened to me reminds us that we must always be alert, particularly when things become routine. "Safety first" is our motto; I should have remembered it that evening. ◆

anonymous

EPILOGUE

Aircraft Accident Summary CF188935

On 27 March 1994, CF188935 departed on a flight from the St. Hubert airport. Upon reaching cruising altitude, the pilot experienced symptoms of hypoxia and noted an abnormally high cabin pressure altitude reading. A descent was commenced and the decision was made to return to St. Hubert where, following the second approach, the aircraft landed. During the landing roll, the pilot did not experience the expected rate of deceleration and believing the normal brake system had failed, selected the Emergency Brakes. Shortly thereafter, the aircraft entered into an uncontrollable skid and departed the side of the runway. The pilot and the passenger were uninjured and initiated an emergency ground egress while the aircraft sustained "B" category damage. The investigation into this accident has now been completed.

At the time, St. Hubert was experiencing low cloud and reduced visibility due to snow and a report issued shortly after the mishap showed that the runway was wet and 10% slush covered. In addition, it was found that the total aircraft weight was approximately 36,000 pounds and that the normal braking system was serviceable. The investigation into the state of the landing surface showed that the runway intersections are characterized by depressions that result in standing water (ponding). Testing also indicated that although the runway surface is only lightly textured, the aircraft should have been able to stop within the available runway length. The investigation also examined an asphalt patch that was thought to have induced the loss of directional control. Although its surface texture is not appreciably different from that of the runway, it was noted that the patch was higher than the surrounding area. It is likely that the left main gear tire travelled over the asphalt patch which exhibited a slightly higher coefficient of friction than the area over which the right tire travelled (standing water). This slight difference, in combination with the left crosswind, likely aggravated the aircraft's directional control problem.

Rear view, approx 24 hours post accident.

It was noted that human factors, such as the phenomenon of performance degradation with increasing stress load, figured prominently in this mishap. The pilot was initially faced with two emergencies as well as rapidly deteriorating weather conditions. The decision to return to St. Hubert vice diverting to another airport which offered substantially longer runways, combined with the inability to conduct a landing from the first approach, denote two actions indicative of a pilot operating under acute stress. It has also been shown that during periods of high stress there is a tendency to revert to a previously learned behaviour, no matter how inappropriate. In this case, the aircraft was operating from a landing surface that was considerably shorter than the runways at the pilot's home base. Although the aircraft was slowing normally, due to heavy weight, contaminated landing surface, and the shorter than normal runway length, the pilot perceived a lack of deceleration similar to that experienced during a previous incident and reacted inappropriately by selecting Emergency Brakes.

In response to this accident, DFS is placing increased emphasis on human factors training during the Wing and Unit Flight Safety Officer Courses. A training video entitled "Decision Making in Single Seat Operations" has also recently been released. In addition, an amendment has been inserted into the GPH 205 and GPH 205S indicating the existence of a water "ponding" problem at the St. Hubert Airport. ◆

WING BIRD AND MAMMAL CONTROL PROGRAMMES

The recent crash of a USAF E-3 AWACS in Elmendorf, Alaska has clearly highlighted the dangers that birds cause to aircraft. The investigation revealed that the numerous birdstrikes sustained by two of the four engines caused the aircraft to crash.

While this Headquarters has no indication that the continuation of wing bird and mammal control programmes are at risk, it is important to note that the use of risk management to evaluate proposed downsizing of various programmes and/or personnel costs must be considered very carefully. The old adage 'an ounce of prevention is worth a pound of cure' is certainly apropos when deliberating the effectiveness and cost benefits of a pro-active bird and mammal control programme.

The tragic causes of the Elmendorf, Alaska AWACS accident.

The cost to repair or replace today's sophisticated aircraft, or any loss of life, far outweighs the cost of a Wildlife Control programme. AIRCOM is experiencing a steadily improving safety record with respect to bird strikes and this improvement translates into immediate and significant cost savings for the Air Force. While the need for cost cutting through re-engineering and/or downsizing is understood, we must exercise caution when considering reductions to wildlife control programmes. This recent accident at Elmendorf AFB reveals the possible downside of accepting too much risk. ◆

CHANNELIZED PRESSING

During the Gulf War, our C130 encountered engine problems and we were forced to spend four days on the ground in Taif, Saudi Arabia, waiting to be fixed. During the fix, as time dragged on, Ops in Lahr were growingly concerned on when our aircraft would be returned to the airlift flow. This, combined with my desire to get back to Germany created the illusion that I had to get that aircraft back, pronto!

On the morning we were finally fixed, my plan, channelized as it was, only included one destination...Lahr. I figured we could make it, but only with an 18 hr crew day. As events transpired...an airtest was required...we had to refuel in Cyprus...the flight engineers crew day had started well before the pilots...it was obvious that reaching Lahr was impracticable... obvious to all except myself.

Under my direction as Aircraft Commander, we continued to Lahr...the crew was complaining, was tired...and we all fell asleep at varying times during our transit. We arrived at Lahr well over a safe crew day. We should have stayed in Cyprus and I should have listened to my crew and recognized the warning signs. Flight safety was compromised due to my channelized pressing. ◆

GOOD SHOW

**SECOND LIEUTENANT
MARC-ANDRE BOULIANNE**

2Lt Boulianne, a glider flight instructor, was giving instruction to a cadet in a SZ-33 glider. While on tow at approximately 2000 feet, he noticed glider C-GCSK, which was at his one o'clock position, heading directly towards him. Just when 2Lt Boulianne was about to release his glider to avoid collision, glider C-GCSK initiated a right turn which seemed to increase the distance between them. Nevertheless 2Lt Boulianne continued to monitor the other glider. Shortly after his turn away the pilot of C-GCSK turned left again putting his glider in a direct line with 2Lt Boulianne's glider. 2Lt Boulianne immediately released the tow and initiated a climbing avoidance turn that positioned his glider directly over glider C-GCSK thus alleviating any further conflict.

2Lt Boulianne's vigilance and quick reaction in anticipating the manoeuvres of the other glider avoided a mid-air collision and possible loss of life.

*Good show,
2Lt Boulianne !* ◆

GLASS COCKPIT TECHNOLOGY - A MIXED BLESSING

by Ian Mack, DCIEM

Computer control and monitoring of aircraft systems has made flying smoother and more efficient. However, the introduction of high technology in aircraft has not been trouble free. For example, a 1995 ground incident that resulted in major damage to a CF Airbus resulted from an improper understanding of the consequences of manual intervention in an automated system. The use of high technology in the man-machine interface has added a level of complexity that provides an advantage during normal flight, but which can become a hazard during unusual situations.

The problem is not a new one. In its report on the crash of Eastern Airlines Flight 401, the US National Transportation Safety Board (ref 1) said:

"Basic control of the aircraft and supervision of the flight's progress by instrument indications diminish as other more pressing tasks in the cockpit attract attention because of the overreliance on such automatic equipment."

This was written in 1973, and the aircraft in question was an L-1011 which had recently had an autopilot upgrade. The Board found that this upgrade resulted in a lack of understanding by aircrew about how easily the aircraft could lose altitude with the autopilot operating. The Board also found that:

"Although formal training provided adequate opportunity to become familiar with this new concept of aircraft control, operational experience with the autopilot was limited by company policy."

Cockpit of the CH146 Griffon.

MCpl Pete Nicholson

The use of high technology in the man-machine interface has added a level of complexity that provides an advantage during normal flight.

It is easy to compare CF transport aircraft with commercial aviation, but do automation problems exist in the more unique environments of military fast jet and helicopter operations? The answer is most certainly yes, but the problems may be different. For example, the following excerpt from NASA's Aviation Safety Reporting System (ASRS) illustrates two issues of general concern - 'heads down' time and programming automated systems. The text, from report number 144692 (ref 2) has been slightly edited to increase readability:

After the GA switch had been pushed to 'Go Around', the pitch mode engaged correctly but the pilots were unable to disengage from localizer capture, even after trying several alternate methods. Eventually the computer functioned normally after the copilot selected another approach with numerous entries tried. This required a lot of 'Heads Down' work at a time when it was most undesirable.

Later, in the same report, this jump seat pilot goes on to say:

The day before, the Captain wanted to fly an approach because of a computer problem and needed to enter a new frequency, but could not do so because the 'scratch pad' was full; it could not be cleared because of a computer malfunction!

How do we reduce the risk of similar incidents in CF aircraft?

First, although technology makes flying easier and can increase operational capability, the need to understand the behaviour of the aircraft as a system is greater. Understanding how automated systems perform in unusual situations is important and this should be reflected in training. Our aircrews may need to develop new skills in monitoring automated systems, where information is presented in different ways, where actions may have consequences that show up much later, and where interactions of automated systems may have unexpected results.

Second, procedures may need to be refined. In automated aircraft, mode confusion is a significant link in the accident chain. The introduction of a "mode verification" item in checklists may reduce the chance it will end up contributing to an accident. The full consequences of mode selection can be examined, for example, in the simulator - where time is plentiful - and the results included in time-saving checklists for use in the air.

Third, Crew Resource Management training will become more important in automated aircraft. Routine monitoring tasks may need to be verbalized to ensure the crew has a common

Understanding how automated systems perform in unusual situations is important and this should be reflected in training.

understanding of a situation. The division of responsibilities in the presence of automated cockpit systems requires careful management. In commercial aviation there have been instances of Aircraft Captains becoming focused on the details of reprogramming an FMS, resulting in a failure to manage the cockpit during a changing situation.

Almost every aircraft in the CF inventory has some degree of automation, and the use of such technology is growing. The introduction of the Griffon and the avionics upgrade to the C130 fleets are two examples. To complement the efforts of our standards and training organizations, all members of the CF aviation community should look for opportunities to improve training and checklists to prevent an automation link from completing the accident chain. DCIEM is researching these issues and we welcome your input from the operational community.

The author is a defence scientist at the Defence and Civil Institute of Environmental Medicine. ◆

References:

1. NTSB, AAR, Eastern Air Lines Inc. L-1011, N310EA, Miami, Fla, December 29, 1972, Washington: June 1973.
2. ASRS, Accession Number 144692, Mountain View Calif.: March 1990.

THE SQUADRON SUPERVISOR

by LCol P.A. Nodwell and Maj H.M. Tate

Spent an interesting afternoon sharing pizza and war stories with a fighter pilot during a section get-together. Laughter and light-hearted pleasantries abounded for awhile but eventually, the hangar talk turned serious. This time the subject was the critical role played by the squadron supervisor. Although my winger and I are the products of different backgrounds, we soon discovered that we were expressing the same concerns about the vital role played by the those individuals assigned to supervisory positions.

Unfortunately, we expressed serious dissatisfaction with some of the personnel functioning in a supervisory capacity. At the risk of offending some of our contemporaries, we will offer some scenarios that required strong leadership (that was lacking for whatever reason) and then we'll propose some basic guidelines for performing the supervisory role more effectively under similar circumstances.

Immediately, what comes to mind are breaches in flying regulations. We have limited the scope of this article to this specific area for illustrative purposes only. Some examples follow:

a. providing the customary "morale booster" low pass during extended deployments - affectionately called the wake up call;

b. completing an IFR flight without sufficient fuel reserves;

c. turning a runway inspection pass (at an austere airstrip) into a low level, high speed pass;

d. modifying SOPs during deployments without proper authorization; ...

We could go on since the list is longer, but you get the drift, right? So what does the supervisor do about these situations? Long before any such occurrence, the individual should have formulated a priority list (ideally before assuming the supervisory position). Although tailored to meet individual needs, it would start off something like this:

a. develop a command presence;

b. judge, and expect to be judged, on two basic elements - professional competence and integrity;

c. determine the suitable balance between flying and supervisory requirements (We know that's a tough one but you are needed on the ground more than you might expect. Rule of thumb - the supervisor can paint with a bigger brush on the ground than in the air);

d. know your people (although this is critically important, it is not very well done);

e. lead by example (very basic, but again, not particularly well handled); ...

Again, we could go on, but we're sure that you get the picture. Armed with this priority list, you should be ready to function as an effective supervisor. There is no doubt that the squadron milieu is a busy place that offers a steady stream of problems or concerns as matter of course. Sooner or later, the first incident requiring possible disciplinary action will occur. There are three points well worth remembering when addressing this particular problem area. Firstly, be thorough and open in gathering information. Secondly, be fair, just and prompt in reaching and making known your decision. Thirdly, (and this goes along with establishing a positive command presence), expect to be judged as a leader by the manner in which you handle all aspects of the incident. When considering this third point, it is important to note that leadership is not a popularity contest.

Prior to leaving this theme, we should point out that far too often, the supervisor facing a problem feels the need for action (meaning direction) immediately. This may be ill-advised. Direction must occur, but in due course and only after all aspects of the issue have been examined. For fear of spoon feeding, we won't elaborate further regarding the decision making process, other than to point out that supervisors must place loyalty in the proper perspective. From where we sit, there is far too much loyalty downwards (a looking after my boys syndrome). Remember, if it's time to kick ass, then do just that. In other words, practise the law of primacy - be right the first time.

Operational squadrons have always been a beehive of activity, often stretched to the absolute limit from a resource perspective. Too frequently, supervision is sacrificed somewhat to get the job done. Each year, a number of new and promising aircrew arrive at units eager to fly; and thank God for that. Their task is twofold; learn the aircraft and learn the role. Mistakes along the way are inevitable as they broaden their horizons. Strong and readily available supervision will go a long way towards proper professional development in these instances. Be there when it's needed. If you're not, then who will be? By the way, when the pace picks up, avoid the convening of the catch all meetings where pressing operational or training matters are discussed in the same venue as the coffee fund. Separate administrative and operational matters and convene meetings accordingly.

Okay, we've had our say in court. Our aim was to encourage aircrew to talk about this article regardless of whether you agree with us or not. A healthy jaw session during a structured meeting or at the bar will produce the desired results. Believe us, all aircrew have opinions regarding the running of a squadron so talk it up and we'll all be better off. Remember, if you don't examine and practice leadership, you will never be good at it. As we see it.

Article was written by LCol P.A. Nodwell, ATGHQ/G2/G3 and Maj H.M. Tate, NDHQ/DGAD, with special acknowledgement to all who critiqued the submission. ◆

METAR/TAF - COMING SOON ! ! !

by Jim Yip, DGMetOc/DMWS 2

It is 1900Z on 3 June 1996, and Hornet 14 is a CF18 enroute on a training mission to 8 Wing Trenton. Hornet 14 requires the latest weather at Trenton and is contacting Trenton METRO service on his radio.

Trenton METRO, Trenton METRO...This Hornet 14, a CF18 enroute to Trenton and requesting your latest actual weather, over.

Hornet 14 this is Trenton METRO...the latest Trenton METAR is wind 060 degrees true at 10 knots, visibility three quarters statue miles in light rain and mist with the RVR for Runway 06 at 4000 feet with a downward trend. Clouds are broken stratus fractus at 800 feet and overcast stratocumulus at 3000 feet with a temperature at 19 degrees celsius and a dew-point at 15 degrees celsius. The altimeter setting is 29.92 inches with windshear on Runway 06. How copy Hornet 14?

METAR CYTR 0319000Z 06010 3/4SM R06/4000FT/D -RA BR BKN008 OVC030 19/15 A2992 WS RWY06 RMK SF5SC3 SLP134

Trenton METRO this is Hornet 14...Uh...What is this METAR stuff?...where did the hourly SA code go?

Hornet 14...Oh! did you not hear? As of 1800Z today 3 June 1996, the hourly SA code and FT code has been officially replaced by the international meteorological METAR code, the corresponding SPECI code and the TAF over all of Canada with implementation within the US to follow.

Trenton METRO...Yes, now I kind of remember some mention of this at ground school training last month. Perhaps you could help me with the decoding of the Trenton 1900Z METAR?

Hornet 14...Of course, no problem. **METAR** is an aviation routine weather report and the corresponding SPECI is a special report when there is a significant change to the weather. The four letter ICAO identifier **CYTR** is followed by the date and time of the observation **031900Z**. The wind direction 060 is given as three digits to the nearest 10 degrees true. **VRB** is used for variable direction, if three knots or less and calm it is encoded as **00000KT**. The next two digits **10** are speed in knots, followed by gusts to a 2-digit maximum.

Trenton METRO...I guess I should have been awake during ground training but I am reading you 5 by 5 so far, go ahead.

Hornet 14...**3/4SM** (three quarters of a statue mile) is the prevailing visibility. Visibility of 15+ is encoded as **15SM**. Lower visibilities which are half or less of the prevailing visibility are reported in the remarks section. **R06/4000FT/D** (RVR for Runway 06 is 4000 feet with a downward trend) is the 10-minute average runway visual range reported when prevailing visibility is 1 mile or less and/or the runway visual range is 6000 feet or less. "D" indicates downward trend, "U" upward trend and "N" no change.

Trenton METRO...Yes, good stuff, go ahead.

Hornet 14...**-RA BR** (light rain and mist) is the present weather and is comprised of weather phenomena (precipitation, obscuration, or other) preceded by one or two qualifiers (intensity or proximity to the station and descriptor). **BKN008 OVC030** is sky cover amounts which are cumulative. Therefore layer amounts include the sum of any layer below. Codes for sky cover amounts are: **SKC** - sky clear; **FEW** - few, less than 1 to 2 oktas; **SCT** - scattered, 3 to 4 oktas; **BKN** - broken, 5 to less than 8 oktas; **OVC** - overcast, 8 oktas and **VV** - sky obscured. Cloud height is reported in 3 digits in hundreds of feet. **CB** or **TCU** is added as needed. Vertical visibility (VV) is reported in hundreds of feet. Partially obscured is reported as SKC (if no cloud) or is included with the first layer.

Hornet 14...**19/15** are temperatures and dew-point in degrees celsius where observed values with 0.5 degrees are rounded up to the next warmer degree and M signifies a negative temperature. **A2992** indicates an altimeter setting of 29.92 inches of mercury. Some countries use **"Q"** which indicates hectopascals. **WS RWY06** is supplementary information on windshear within 1600 feet above ground level, provided by an aircraft along the take-off or approach path. **RMK SF5SC3 SLP134** are remarks and include layer type and opacity in oktas of clouds, general weather remarks and sea level pressure in this case 1013.4 hPA. The aerodrome forecast **(TAF)** indicates that the weather will remain the same for the next few hours, how copy?

Trenton METRO...Thank you for the help. I am not requesting an explanation of the TAF at this time as I have to go back to area control.

Hornet 14...Further information can be obtained from your friendly Wing Meteorological Officer or from the METAR/TAF Study Guide Edition III, prepared and supported by Environment Canada and Transport Canada Aviation. This study guide should be located in your squadron operations centre, over.

Trenton METRO...Thank you for the help. I will familiarize myself on the new code when I get back to home base. Got to go now. ◆

FLIGHT SAFETY: A POTENTIAL CASUALTY

This article was received through the Flight Safety network after being reviewed by the applicable supervisors. While all do not concur with the author's message, they do agree it does raise some interesting points. The article is being published to generate discussion at your unit . DFS welcomes your comments. ed.

From my perspective in maintenance there is a foreseeable erosion to the founding principle on which we "maintainers" carry out our duties: Flight Safety. In this time of change, MOC 500 restructure (multi skill enabler?), compounded with the demands of "re-engineering" and the resulting reduction of personnel, is creating fear that the traditional Flight Safety foundation is crumbling. This fear is cultivated by continual reassessment of the options forced upon us by the down sizing directive "Do More With Less" and re-engineering terms like "Risk Management". The Air Force has responded to this challenge by installing checks and balances at all levels, in the form of management directed re-engineering committees. I believe the expertise and professionalism on these committees will serve us well in maintaining the essence of Flight Safety. It is also clear the successful restructuring of our Air Force while maintaining the current commitment to Flight Safety will also depend greatly upon each of us as individuals. In spite of what we have been led to believe, **less cannot be more, less is less!** In the face of such dramatic restructuring there exists the danger of cannibalising the individual by the organization. As more demands are made on him/her without the traditional compensating mechanisms and as the individual is forced to live off his/her reserves, often at considerable cost to them, Flight Safety will inevitably suffer. Maintainers must minimize this side-effect of a leaner and smaller Air Force.

It has been said that the greatest potential improvement in Flight Safety depends on the human dynamic - you and me. While this subject is far too complex to discuss here in depth, I would like to present three areas of concern.

In the face of such dramatic restructuring there exists the danger of cannibalising the individual by the organization.

First, the process of change itself. Without it we would fossilise - too much and we would lose control. I don't think anyone would argue that we are leaning more towards the latter. How does it effect Flight Safety? A person who has a clear area of responsibilities and clear accountability, whose turf is not subject to invasion by the process of change, works in a healthier environment than one whose boundaries are unclear due to change. Pressures for change, for efficiency, and for cost cutting, can definitely lead an individual to take short cuts that run counter to his sense of conscientiousness. A tragic example was the space shuttle Challenger disaster. Many people involved lost control over their work due to these pressures. They were making decisions that did not fit at all with their value system. One hopes they dealt with themselves compassionately in the aftermath.

Secondly, the reassessment of proven maintenance procedures is in the interest of efficiency, a valid and necessary goal. We as maintainers know that most of these traditional procedures of the Flight Safety concept were usually born in response to tragedy. To us every step in a checklist has been earned, every CFTO is actually a log of past mistakes. That being said, restructuring is not an exact science and that "risk management" is now a part of the process. Growing pains are inevitable. As new procedures are implemented they should be criticized not only for efficiency but even more so in the interest of Flight Safety.

Lastly, there is an offshoot of down sizing that has been with us since its inception, no promotions or financial incentives. Does this have Flight Safety implications? Perhaps, but the following speaks about the competitiveness of human nature. The scent of only one or two possible promotions per trade (with its IPS and financial implications) has set up unhealthy competition for these prized possessions. The trend is either "dog eat dog" or to completely withdraw from the race. In each case individuals end up doing their own thing with little reference to the work group. This is not conducive to good aircraft maintenance. I don't suggest we have a group hug but, just keep in mind the nature of the beast.

In conclusion, some of us are using restructuring as an excuse to cultivate and wallow in our favourite bad feelings. This may be more than justified. Unfortunately, Flight Safety is likely to suffer. Professionals will not lose sight of the fact that they are morally and legally responsible for the performance of their aircraft and the safety of the crew and passengers. Who do you associate yourself with? Are you flying with eagles or pigeons? Or perhaps with vultures for whom you are providing the meal. This means that if Flight Safety is to survive in its present state it will not be through re-engineering and the stripping of the traditional values. It will be up to everyone to ensure that Flight Safety stays where it has always been the most sacred place - the primary code of the maintainer. If I have offended anyone, I apologize. ◆

SO YOU'RE THE NEW INSTRUCTOR

by Capt W.F. Canham, DFS 3-4-3


Capt Ken Murray, USAF

CT114 Tutor of Central Flying School.

As a QFI or an OTU instructor you are entrusted with passing on the skills applicable to your trade. You were selected because you have plenty of aircraft experience. You have been told where to anticipate student errors and been given a few tips and techniques to pass along. Hopefully, you have been instructed about "how to teach" and about "how to keep yourself organized" during each lesson.

In your training you were likely shown some student errors but not nearly all of them. This then raises the question, "when your student makes an error - how far do you let it go?"

A case in point: Recently an aircraft received minor damage when the instructor failed to intervene following the student's high flare before landing. The high round out resulted in a stall and the aircraft impacted the runway.

When the student is flying: How slow do you go? How far off track can he get? How much crab can the landing gear withstand? How low is too low? How far off centre line do you take it? You could probably extend this list infinitely.

These are all good questions that will require your instantaneous judgement. To help you prepare for this eventuality consider the following advice passed on over years of aviation experience.

Talk about realistic limits among all instructors on a regular basis. You can easily take advantage of others' experience in these forms. Do it regularly.

Demonstrate and discuss the limits on instructor training sorties. Fly with the most experienced IP on the unit and get him to show you what he accepts. Learn all you can.

Ask yourself if there is added training value by letting the student go too far. Obviously resulting damage will teach the student not to do that again! Can you illustrate a better method once he has left the realm of expected performance that saves valuable training time?

Let your conscience be your guide. Often when you instruct it is easy to detect the really big deviations because your own survival instincts will take over. Don't forget to intervene even when you have those "slight" feelings that something is alarming. This could be summarized as a sixth sense!

Finally, don't be a test pilot. If your mentor never gave you a "simulated" engine failure at the top of the confined area it was probably for a good reason. For reasons of excessive risk! You can probably do that scary stuff in a simulator, but excessive risk in training scenarios usually damages more resources than we loose to the actual emergency. ◆

de HAVILLAND DHC-4 CARIBOU

artist: John Matthews

de Havilland DHC-4 Caribou of 102 KU Royal Canadian Air Force Station Trenton June 1963.

The Caribou was powered by two Pratt & Whitney R-2000 engines of 1450 horsepower and had a gross weight of 28,500 pounds. The Caribou could takeoff in 725 feet, and land in 670 feet and provided excellent support to UN and disaster relief operations. ◆