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Flight Comment

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Did You REPORT IT?

I used to be a secondary instructor on a Maritime patrol training (MPT) flight, which is part of the Maritime operational training of aircrew for the Argus. It was about three quarters of the way through the course, and the students were getting comfortable and familiar in their new environment.

This particular flight was very busy and you could see the fatigue in both the students and the instructors. With the end of the course approaching, we were attempting to get all of the teaching points covered that may have been missed during previous flights. During the flight, we dropped sonobuoys for acoustic training. As we were conducting this exercise, we encountered a misfired, cartridge-activated device (CAD), which are used to fire the sonobuoys out of the aircraft. The procedure for the misfired CAD was conducted in accordance with the aircraft operating instructions (AOI's) but, because it was not an operational necessity to use the pressurized sonobuoy launch tube (PSLT), we elected to leave the stores in place until landing. We made sure to create reminders by taping off the PSLT and by writing in big letters "MISFIRED CAD." With all we had done, we were certain that we wouldn't forget to report to our weapons technician that we had a misfired CAD in the PSLT. Of course… that's exactly what happened!

It was my responsibility to monitor a technical debrief with the students if any of our equipment needed repairing. When we landed, the technicians came on board to prepare for the debriefings. Add to them the students and instructors trying to gather pubs and equipment, and there were over twenty people on board. Everyone was tired and in a rush, and there was barely enough room to manoeuvre. The lead airborne electronic sensor operator (AESOP) informed me that, except for the misfired CAD, the students had completed the technical debriefing and he would take care of the rest. In my head, I assumed that I was permitted to leave, while the AESOP would ensure the CAD was reported. About one hour later, I started to wonder about the misfired CAD that I had not reported. It was about that time that the AESOP called me to confirm that I had reported it.

Although we were both experienced instructors, I should have specifically informed him that I did **not** brief the misfired CAD prior to exiting the aircraft. After all of the reminders and instructions to the students on what to do, we still missed it. A busy environment, fatigue, and a long day caused an eagerness to exit the aircraft. Now, I ensure that I take a few seconds prior to leaving, **especially** after a busy day, to ensure that I carry out my post-flight duties. ◆

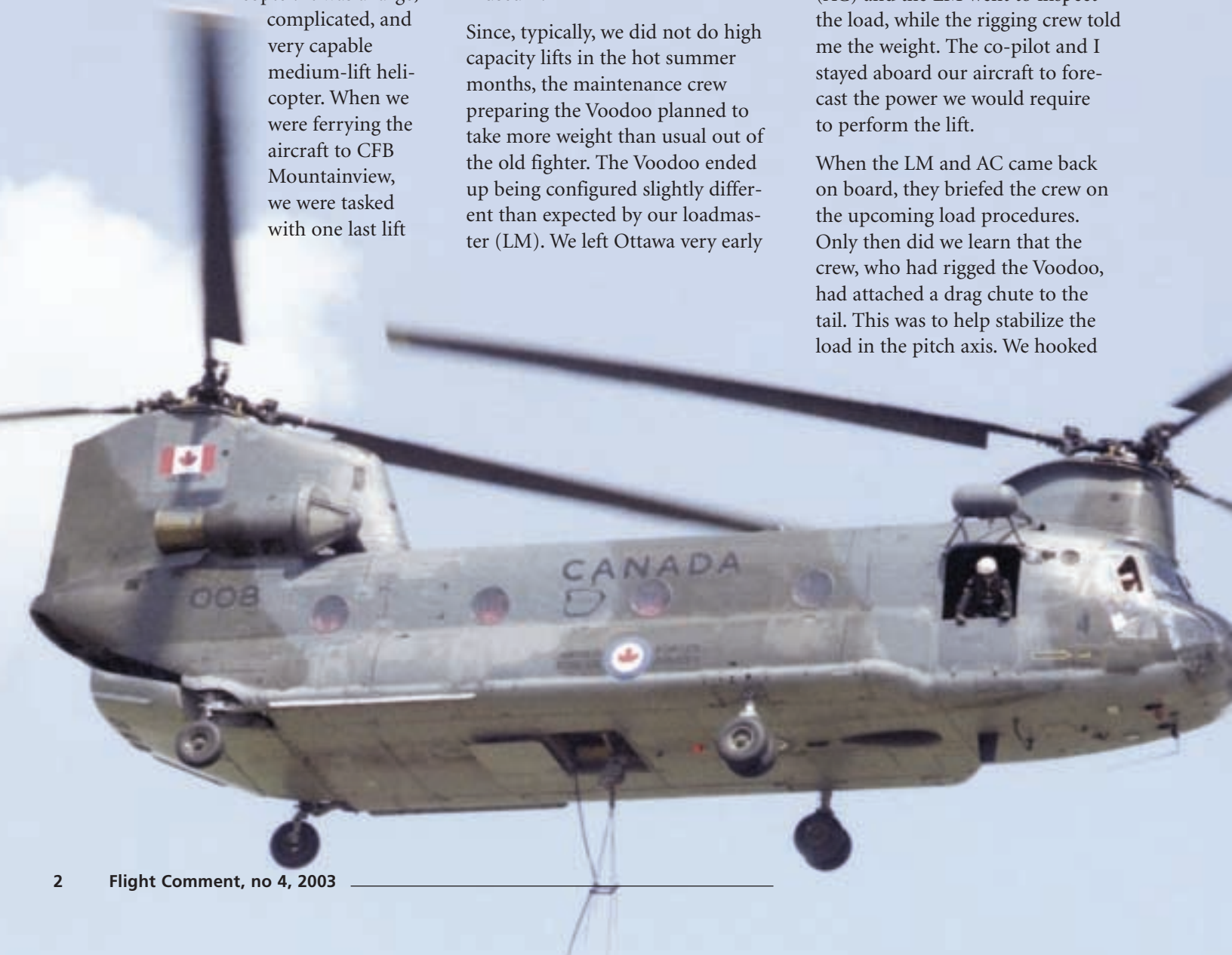
Sergeant McGrath

CREW SAFETY Always Comes First!

When I became a flight engineer (FE), the first airplane I served on was the Chinook helicopter. It was a large, complicated, and very capable medium-lift helicopter. When we were ferrying the aircraft to CFB Mountainview, we were tasked with one last lift — a Voodoo airplane had to be transferred over to a pedestal, located at the CFB Trenton Museum.

Since, typically, we did not do high capacity lifts in the hot summer months, the maintenance crew preparing the Voodoo planned to take more weight than usual out of the old fighter. The Voodoo ended up being configured slightly different than expected by our loadmaster (LM). We left Ottawa very early so we could inspect the load, on location, just at sunrise. Upon our arrival, the aircraft commander (AC) and the LM went to inspect the load, while the rigging crew told me the weight. The co-pilot and I stayed aboard our aircraft to forecast the power we would require to perform the lift.

When the LM and AC came back on board, they briefed the crew on the upcoming load procedures. Only then did we learn that the crew, who had rigged the Voodoo, had attached a drag chute to the tail. This was to help stabilize the load in the pitch axis. We hooked



up the load as per normal, and lifted the engine effortlessly. We were very close to maximum power, but we were still in the green. As we started transiting forward, the load was swinging a little back and forth. This was fairly normal, and so we initiated the climb without a problem. It wasn't until we levelled off, at about one thousand feet, that the problem started. The Voodoo was swaying a lot under us and, any time we stopped the climb, it was swinging so much we couldn't descend. The LM and AC, who were flying the lift, tried every trick in the book while I called the airspeed.

I looked back into the cabin and saw that a book had fallen on the floor and some papers were flying around, so I went back to retrieve it. While I was in the back of the helicopter, I decided to have a look at the load since I had never carried something that long under the Chinook before. As I stood beside the four-foot floor hatch, I couldn't see the load. Immediately, I called "jettison, jettison, jettison" and said, "I cannot see the load." The AC pushed the jettison button, but the load was so far out that it did not release. As it swung back towards centre, the AC tried to jettison the load again. This time, the jettison was successful and the Voodoo crashed into the Bay of Quinte.

Although I was a relatively new FE with only 360 hours of experience, I remembered an experienced LM telling me that if you couldn't see a long load in the hatch, it must be out of control. Later that day, when we reviewed the tape sent from Trenton air traffic control, we were amazed by how much the load was, in fact, swinging. That day, we all learned that even if we really want to accomplish the mission, the safety of the crew must come first. ◆

Sergeant Dupont

My False Sense of Security

In November 2001, our squadron was tasked to provide assistance to an unserviceable T-33 aircraft by transporting technicians and equipment from 14 Wing Greenwood to Patrick Air Force Base. I had only, days earlier, returned from a five-week, non-flying course and, thus, required numerous hours to maintain currency as a navigator. At the time, I was plagued with allergies and a cold, however, without this particular flight, it was very likely that I would be unable to remain current.

To further substantiate my choice to fly, I rationalized that, in the few years I had been flying, I had never experienced any inner ear problems due to a cold. With our current reduction in flying, I did not want to risk the opportunity to gain a great deal of much-needed hours. Essentially, I had lured myself into a false sense of security. Departing Trenton on schedule, it was only a short time until we began our descent into Greenwood. It began as a mild ache in my right ear, which, after unsuccessful attempts to clear, I ignored. As the descent continued, the ache was replaced with sharp pain. Slightly embarrassed by my situation, I asked the third pilot, off headset, if he was experiencing any ear problems. He responded that he was not, and I still said nothing regarding my condition. The pain was increasing steadily, and it was not until I was no longer able to concentrate on my duties, that I, once again off headset, spoke to the flight engineer (FE) instructor.

He immediately instructed me to advise the crew that I was having ear problems, and instructed the student engineer to reduce cabin pressure. The pain slowly began to subside, allowing me to concentrate once again on the approach, which was now in the latter stages. In essence, my fear to show any physical weakness to the crew, could have cost me not only my hearing but, as well, could have posed a very serious flight safety hazard during a critical phase of flight. ◆

Captain Briand

He's COMPETENT, In Spite

It was a windy fall day at the end of our flying season when myself and four other pilots were preparing to transport two Belanca Scout tow-planes and two gliders from CFB Borden to the maintenance facility at Mountainview, where they would spend the winter. I was scheduled to fly the lead Scout, towing a glider in loose formation with another Scout and glider. I found out that morning however, that since I was the only check pilot there, I'd be riding in the rear of the tow-plane for a new tow pilot's cross-country check-flight.

The take-off was a bit rough but uneventful, as was the rest of the two-hour flight. After passing through the Trenton control zone, our four aircraft arrived over Mountainview and entered the circuit. There was already a gliding operation in progress, with three other aircraft in the circuit. The wind was just under fifteen knots and was coming straight down runway 35, the active runway. After releasing our glider, we spiralled in descent and joined the circuit on a left-hand downwind leg. The landing pattern at this point was somewhat busy with gliders.

Due to the congestion on base leg and on final approach, the launch control officer (LCO) on the ground radioed us to ask us to either go around or to set up for a base leg on runway 06, to land away from the congestion. We were perfectly set up for this base leg, and I prompted the pilot I was monitoring to take this second option. He complied, and I didn't consider the crosswind an issue until, half a mile from touchdown, he was struggling to maintain the runway centre-line. Once I sensed his plight, I suggested landing on the grass beside the runway. Since the Scout can be prone to ground loops in a crosswind, this landing area is usually used. The flying pilot was, justifiably, concerned about the condition of the grass landing surface since he hadn't flown here in a few months, and opted to continue for the pavement. At about one hundred feet from touchdown, I reminded him that a "go-around" and into-wind landing was still an option, as he hadn't yet established a stabilized approach into the crosswind that was flirting with our 15-knot limit at 90 degrees from our left.

He chose to ignore my suggestion and we touched down more abruptly than I expected, with a screech of tires. We went slightly sideways, which caused the tail of the plane to start trying to overtake the rest of it. I'll give the flying pilot the benefit of the doubt and assume that he also countered with hard rudder at the same instant I did, so as to stop the ground-loop from fully developing. Luckily, we had drifted to the right during the approach since, after arresting the ground-loop, the aircraft was travelling into the wind, about 45 degrees left of runway heading, and only had the full width of the 100' wide runway to come to a stop. The Scout was likely extremely close to a full ground-loop, which often results in digging a wing in and causing very serious damage.

# of Me!!

I realized immediately that I had screwed up and had let the situation go too far, but was content to dwell on the obvious shortcomings of the flying pilot. After some reflection, I understood that I was responsible for far more than just allowing a poor landing to continue. I had forced him into a situation that would have been challenging for me, but was far beyond his comfort or proficiency level at the time. Couple that with the added pressure of performing for a check pilot and it's no wonder he didn't challenge my initial suggestion and performed badly. I have no doubt that, had he been alone in the aircraft, he would not have chosen a crosswind landing at the aircraft's maximum limits. He has developed into a competent pilot, in spite of me! Unfortunately, I needlessly shattered his confidence that day because I didn't think ahead enough to appreciate the situation I was putting him into. ◆

Major Hazen

Not Speaking Up

Arriving at my first squadron, having just received my wings, was a truly exciting experience. One of the first pilots I got to know was Mitch. I had heard that Mitch was an excellent pilot and, at age 35, having flown in both the military and civilian worlds, he had logged over 10,000 flying hours. Mitch was also the epitome of polite and friendly. He had been with the squadron for several years and everyone liked and respected him.

However, whenever I went flying as a co-pilot with Mitch, all I saw was a "cowboy." He certainly was an outstanding pilot, and as polite and giving in the cockpit as he was on the ground. Yet, Mitch regularly broke rules. Low flying, flying VFR in less than VFR conditions, and routinely pushing the envelope of the aircraft's performance. I was always confident in Mitch's flying abilities, but uncomfortable with his lack of regard for rules — rules that are in place for reasons of flight safety.

The tragedy is that I never said anything to him. How could I? He was a really nice guy, and a very experienced pilot, and always interested in helping me improve as a pilot. I heard some of the other lieutenants talk about Mitch's flying conduct, but no one would speak up to our squadron supervisors. How could we — everyone liked and respected Mitch, and as new guys, we certainly didn't want to "rock the boat." And so, we hid behind the "code" and kept quiet.

After some months of being with the squadron, Mitch was flying with our flight commander during a trip that resulted in an A-category crash. There were no passengers on board and the two miraculously survived with only minor injuries. It was determined, during the Board of Inquiry, that Mitch was at the controls when the crash occurred. Furthermore, the Board found that his actions and lack of regard for the rules were major cause factors in the aircraft's loss. Upon interviewing the other pilot, the Flight Commander, he stated that he knew that "something" was wrong during the final moments prior to impact. Because he felt Mitch knew what he was doing, the non-flying pilot was reluctant to speak up.

Who was responsible for the crash? The Flight commander, Mitch, or me? I guess we all were. The point is that many factors were involved. Several windows had to line up over a long period of time in order to finally have the ingredients for a near fatal crash. In the beginning, it was silence that saved me from possible ridicule. In the end, it was luck that saved the crew. Had I spoken up, maybe I could have saved them. ◆

Remember, Bad Things Often Come in Two's!

It was my first deployment since entering the Sea King community, and it found me sailing off to the Arabian Gulf. I was fresh out of 406 Maritime Helicopter (MH) training squadron when I was quickly flown to Spain to meet the HMCS Halifax, which was already halfway through a NATO commitment. Little did I realize that, the very next day, our plans would take a drastic change and we would soon be leaving Europe and heading for the Middle East.

Once we arrived in our area of operations, we were faced with a variety of different tasks. One evening in particular, we had already completed our daily flying program, including putting the aircraft "to bed" (away for the night), and were in the middle of a damage control exercise when "emergency flying stations" was piped. We were surprised, but soon remembered that we were the duty crew for the day, so we quickly made our way to the hangar so we could get our helicopter airborne.

It was a hot, calm evening and it was approaching dusk. I remember saying to the aircraft captain (AC), with a laugh, that the weather was not a good combination for our Sea King. We had already had a recurring problem with the #1 engine-fire light coming on when we were in the hover on those calm days; all we could do was handle the problems as per the standard operating procedures (SOP's) and the checklists, and once we resumed normal flight, the light extinguished and the emergency was over. We attributed this to the extremely hot temperatures and to the lack of airflow through the engine compartment housing.

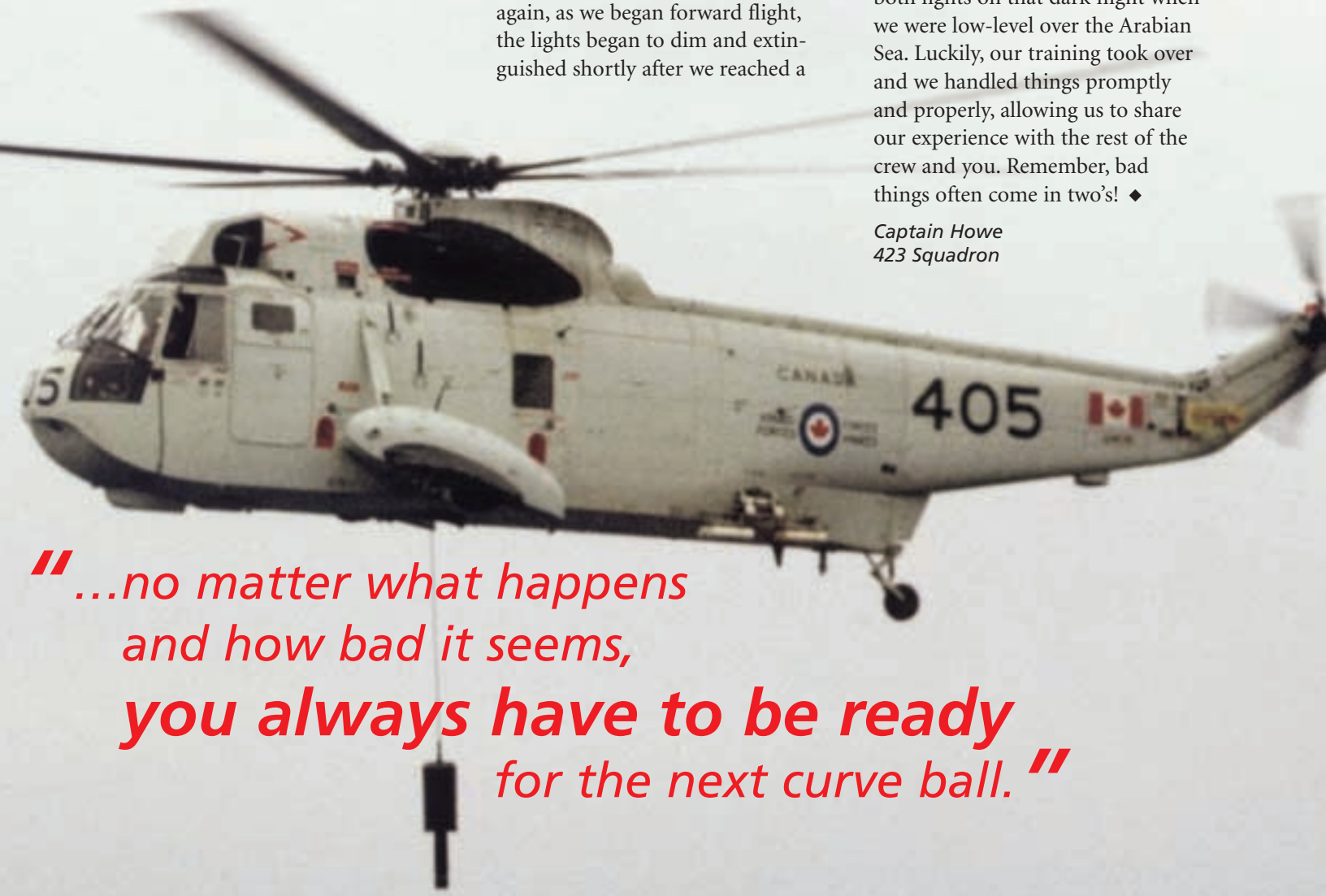
When we learned of the nature of this particular flight, we realized that we had to give it a try. Once again, we launched off of the ship and immediately went into the dip. (The "dip" is when the sonar sensor is dropped into the water from the belly of the Sea King to listen for submarines.) Almost as rapidly, we were faced with the #1 engine-fire light. We departed the dip and, once again, the light went out. We examined our options and decided that our full fuel state was not helping our situation so we decided to dump some fuel. By this time, darkness had all but set in. Before entering the dip, we had to transition to instrument flying as well as low-level, night flying, over the water.

We carefully considered our situation and we agreed that we had to give it another try.

In the back of our minds, we were ready, if not *expecting* to handle the #1 engine-fire light again but, none of us expected what happened next. As we came into the hover at forty feet, everything seemed to be going well until, once again, on came the #1 engine-fire light. The other pilot quickly began assessing the situation and handled the emergency as I maintained control of the helicopter. I called for sonar to raise the dome in preparation to depart the dip but, this time, one engine-fire light wasn't enough. Our excitement was suddenly doubled when the #2 engine-fire light also came on. Now, we had both engine-fire lights on and no apparent fire. We accelerated straight ahead, checking outside and in for signs of smoke or fire. Once again, as we began forward flight, the lights began to dim and extinguished shortly after we reached a comfortable altitude. We elected to head back to the ship and we recovered the aircraft without further incident.

The biggest lesson I took home from this was the fact that no matter what happens and how bad it seems, you always have to be ready for the next curve ball. That night, we had all but expected to see the #1 engine-fire light again, but, we were very surprised to be faced with both lights on that dark night when we were low-level over the Arabian Sea. Luckily, our training took over and we handled things promptly and properly, allowing us to share our experience with the rest of the crew and you. Remember, bad things often come in two's! ◆

Captain Howe
423 Squadron



"...no matter what happens and how bad it seems, **you always have to be ready** for the next curve ball."

Not Such a BIG SKY AFTER ALL!

It's a maxim we've all heard before and, most of the time, it's true… the "big sky" theory. The theory is that odds are very good that two aircraft won't accidentally find each other (resulting in a mid-air conflict) given enough airspace. Usually, the theory works, but it's definitely not to be relied upon.

When I was undergoing second language training in St. Jean, during the summer of 1992, I rented a Piper Warrior from my former flying club in Burlington, Ontario. My passenger possessed, as did I, a commercial pilot's license, and we were both training to be military pilots. Usually, I relished flying alone but, on that day, I was thankful to have a second set of experienced eyes on board.

Our trip would take us from Burlington Airpark to Niagara Falls, where we would fly up to five orbits within the visual flight rules (VFR) traffic pattern, as published in the GPH-205, and then return to Burlington. I had flown this route dozens of times before. At the time, Niagara Falls had a common routing on its VFR procedures chart for all air traffic. Separation for various aircraft types was accomplished by stacking the traffic according to aircraft type and airspeed. Helicopters flew the lowest altitudes, fixed wing planes that flew 130 knots or less flew 300 feet higher, and fast traffic flew 500 feet above that. The orbits followed the same clockwise route and shared a common advisory frequency.

As we approached the critical area, we got the latest altimeter setting and switched to the air traffic control (ATC) advisory frequency. When we left, we knew that it was going to be a busy flight, as it was a weekend. Sure enough, the radio was full of idle chatter, mostly from sightseeing helicopters. After making our own radio call, we entered the VFR pattern and things really got busy in a hurry.

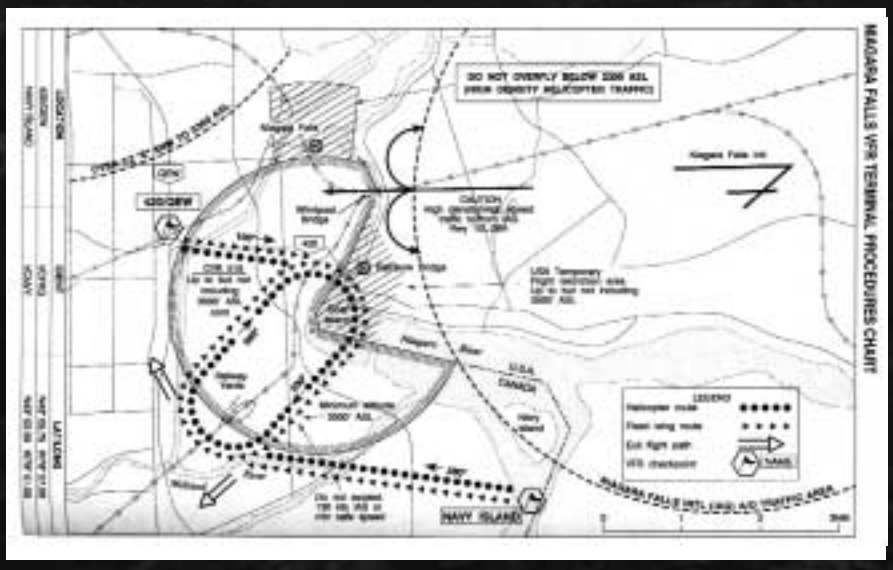
The first conflict was a Cessna, which was travelling in the opposite direction of the published orbit, at our exact altitude. I turned to the right (to the inside of the pattern) to avoid the collision. The Cessna took no evasive action and continued travelling in the wrong direction. While my passenger and I were cursing the actions of the Cessna pilot, a second aircraft — a large sightseeing helicopter in a rapid descent, passed three hundred feet from our right wingtip. The helicopter was inside the published pattern and well above the prescribed altitude. I never saw the helicopter, but my passenger did.

From that point on, we forgot about trying to see Niagara Falls and our heads were on swivels. As we entered our second orbit, my passenger noted two additional fixed wing aircraft that were potential conflicts. Neither of them were following the published routing; both were cutting across the middle of the traffic pattern. As I steered to the outside of the pattern to avoid the closer of the two airplanes, another large, red, sightseeing helicopter, climbing in the opposite direction, passed less than one hundred and fifty feet from our left wing and continued to climb well above us. We decided that enough was enough, and we departed the pattern without ever really seeing Niagara Falls, landing back in Burlington without further incident.

Less than one week later, while watching the news, we saw the twisted wreckage of a mid-air collision between two sightseeing helicopters full of tourists over Niagara Falls, including the same large, red machine that narrowly missed us on the previous weekend. All seven people aboard both helicopters died.

It may indeed be a big sky, but published traffic pattern procedures and VFR cruising altitudes are there for a reason. When people choose to ignore them, the sky quickly becomes much smaller. ◆

Captain Vincent



Is Everybody Ready ??

Our helicopter detachment had spent maybe six hours in port when, at midnight, the ship we were embarked on was recalled and told to slip moorage at 0800 to conduct a medical evacuation (medevac) from a fishing boat that was 400 miles to the east of Newfoundland. The details were scant at best; about the only thing we knew for sure was that it was a long-liner type of fishing vessel and one of its crewmembers had been suffering intense pain for the last week. The crewmember had been diagnosed over the radio circuit to have appendicitis. The weather was stormy and it was not forecast to improve at all during our enroute voyage.

The plan was to go by ship to just within 150 nautical miles (NM) of the vessel, launch the helicopter, hoist up the patient, and then return to the ship. Once we were in position, this roughly equated to a transit time of 90 minutes to the vessel, and one hour to return to the ship. This left us approximately thirty minutes on station to conduct the hoist. Once the patient was on board the helicopter, a quick fuel assessment was to be done to ascertain whether the ship was to maintain closing us, or if it could turn and start heading back to land in case the severity of the appendicitis meant an immediate re-launch of the helicopter and patient to a hospital.

A 150 NM transit to the middle of nowhere is normally fifty miles beyond that of our maximum standard, and several factors were looked at here. First of all, to recall a ship at midnight on its first day into port after having spent almost three weeks in the North Atlantic on a fisheries patrol signified somewhat of an urgency. Secondly was the fact that appendicitis, if not treated in a timely manner, can be life-threatening; this was confirmed by the ship's medical assistant, as well as the higher-ups who felt that the recall was immediately necessary, based on the duration of how long the patient had already been in pain and his current symptoms. Thirdly, if we couldn't get there before nightfall it would mean another twelve hours, maybe the difference between life and death.

At approximately 1500 hours, we were at our gate and departed as planned. There was already an Aurora aircraft providing top-cover, and we had no problems locating the vessel. The sea-state was very rough with huge swells and winds of at least 35 knots. A couple of circuits around the boat confirmed that the only available space to hoist to was the foc'lse, as the back of the boat was littered with gear and masts that would make hoisting impossible.

The ship was asked to manoeuvre so that it would have a relative wind on its starboard side and approximately 135 degrees of its nose. This placed the helicopter in a position with its cargo door and hoist over the clear area of the foc'lse, as well as giving the pilot a view of the bridge for references. This is where we got our first surprise.

To the astonishment of the crew, the fishing boat still had its long-line (miles long sometimes) fishing gear in the water and was still fishing. The ship's captain was not able to fully comply with our request for it to alter course so we could get the ideal relative winds. A breakdown in our so well thought out plan was starting to evolve. The time crunch was on...it was soon going to get dark.

Time was spent evaluating the relative winds and we decided that it was worth a try. After all, we had come this far already! We lowered the AESOP/First-Aider to the foc'lse uneventfully, though under very difficult conditions. Due to a myriad of whip antennas on top of the bridge, it meant that the hover height was abnormally high and, as such, only provided for a glimpse of the bridge as a reference as the boat rolled to the starboard. It also provided us with a glimpse of one of the long-line masts in the lower cockpit window as it

rolled to port, along with swells of twenty to thirty feet. The AESOP disconnected from the hoist and checked on the patient's status to determine what type of hoist would best suit the situation: a double lift or a stokes litter. The helicopter maintained its position on the boat until the AESOP returned with either the patient or the decision to use the litter.

By the time the AESOP returned with the patient, after giving him the quick once-over and getting him dressed in the appropriate gear, at least ten minutes had passed; to me, it felt more like thirty!! I remember thinking that the more I deviated from the position, the more I would have to fight to get back to it. By the time we were ready to conduct the hoist to recover both the patient and the AESOP, I was beyond saturation. To this day, the only thing I can recall is my focus on the boat's bridge and mast as it swung like a pendulum somewhere under and just ahead of my feet. Realization kicked in again somewhere between 150 and 200 feet with both the AESOP and the patient strapped to him, dangling off the end of the hoist somewhere below the aircraft.

Somewhere during the host, the boat violently pitched up and both the hoistees bounced off a bollard on the forward part of the foc'lse. Vaguely I recall hearing a panic-stricken voice conning the helicopter up-up-UP-UP-**UP-UP!!!** Finally I remember hearing an "all-clear" call, at which time all I wanted to do was to get clear of that boat.

The AESOP cracked a rib as he, with the patient strapped to and on top of him, bounced off the bollard. A hover was established at a safe height over the water and the hoistees were recovered without further incident. I have never been so relieved passing control off to somebody as I was at that moment.

We returned to our ship, the patient was checked out by the ship's medical assistant, and we launched again for the hospital shortly afterward. Both the patient and the AESOP are doing well today.

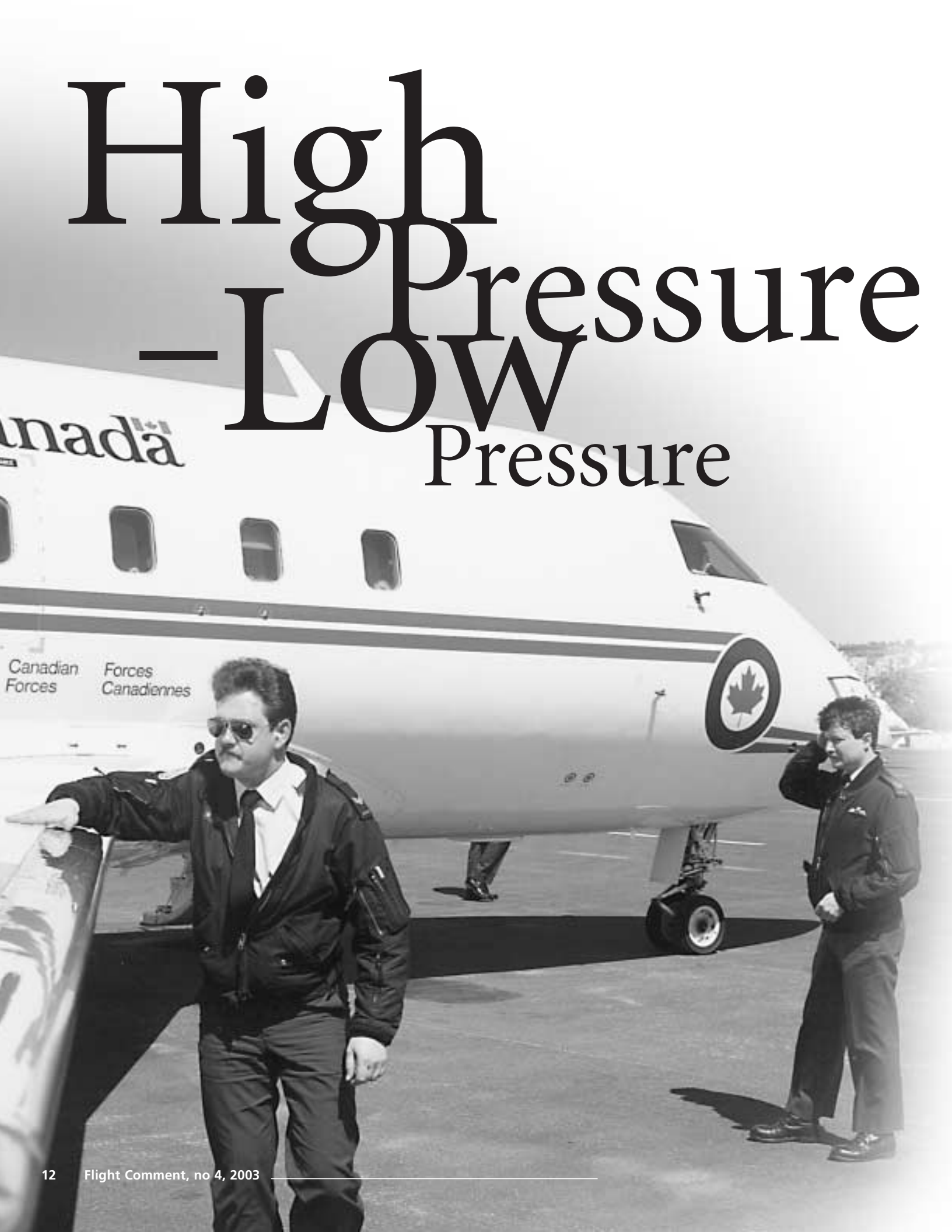
Fortunately, and only a little worse for wear, this mission was a success. We had ample time (seven to eight hours to plan before we launched), and we had trained regularly before this with a Coast Guard boat. The weather was somewhat rougher but it seemed like it would be a pretty routine evolution….until we arrived on scene!! The fishing boat was ill prepared to accept us for a hoist; they were still fishing, did not want to alter course, and had not struck any of their antennae's on top of their bridge to allow a closer hover. Valuable time was used assessing these situations — time we did not have to spare. The difficulty of maintaining the hover throughout the hoist was underestimated, causing me to become over-saturated, inefficient, and unaware of the big picture.

The entire time the ship was enroute and closing the fishing boat, there was good communications between it and at least one other party from which we were receiving information. We had a plan and were ready, however, we neglected to ensure that the fishing boat would be ready for us. The environment we train in is very likely to be in near ideal conditions, which is normally never the case in reality. I could likely have solved the problem of becoming saturated during the task by departing from the hover and passing control to the co-pilot while the AESOP was doing his assessment on board the boat. I felt fresh on the initial hoist down and, in all likelihood, would still have felt so on the final hoist up if I had only done so.

It was a hard way to learn a lesson. Hopefully, you won't have to learn the same hard way if and when a similar situation occurs to you or somebody on your crew! ◆

Captain Antrobus

High Pressure –Low Pressure



I recall how, as a young airframe technician, I became aware of the ever-present pressures to get the job done. Confident in my ability to complete assignments without compromising safety, I was certain that I would never allow the myriad of pressures to affect my work. One afternoon, however, as the shift neared a close, I was finishing up a before-flight ("B") check on a Challenger aircraft, when I noticed that the extension of the left main landing gear appeared a little low.

With the flight engineer and stewards beginning their pre-flight checks, I soon realized that the departure time was nearing and that I had better work quickly. A quick check of the pressure and extension showed that, despite the high pressure already in the oleo, its nitrogen charge was too low. To my dismay, the only available source of high-pressure nitrogen was not quite high enough to do the job. Yielding to mounting pressure from the servicing desk and abandoning my belief in safe working habits, I decided to improvise by jacking the wing. Applying the laws of physics, this would reduce the load on the shock strut and, therefore, reduce the pressure within as the oleo extended. This would enable me to charge it up with the available nitrogen.

In theory, it was a great ideal!! With the shock strut partially extended and the wheel still on the ground, I began charging the oleo. As the pressure increased, it soon overcame the friction between the shock strut's inner and outer cylinders, causing the wing to suddenly jump off the jack and then, immediately, settle back on the jacking pad where it began! As I watched in horror, realizing the potential of what had just happened, I was relieved that the jack had not missed its mark when the aircraft had settled. Over the years since, I have reflected from time to time on the pressures that cause maintainers to stray from safe working practices and, of the day when in all my earnest I, too, became a cause factor of what could have been a disaster. ◆

Sergeant Wils

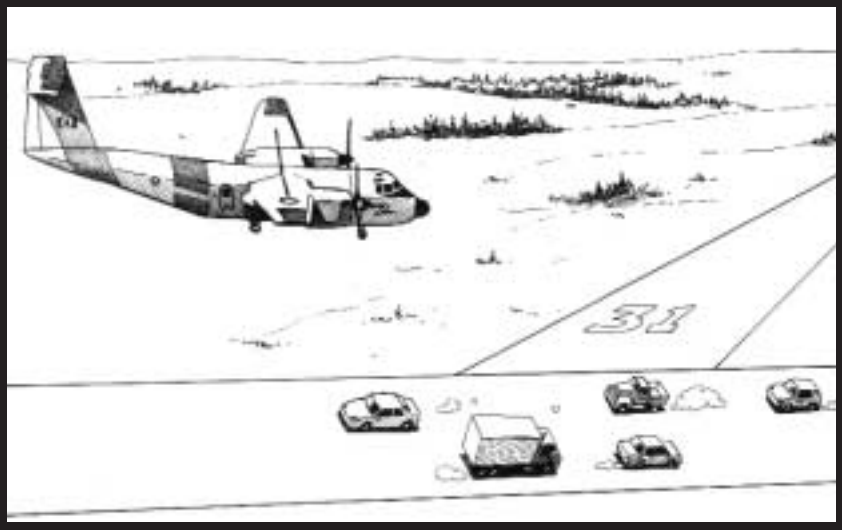
Let's Discuss It!!

This happened a couple of years ago in a light transport squadron. The crew for a training sortie is normally two pilots and a flight engineer (FE). This was a night-flight with two high-ranking pilots. The Aircraft Commander (AC) used to be a fully qualified instructor ten years ago, and returned to the base as a Wing Commander. The other pilot was the Group Commander and had done an abbreviated course on the airplane. He had less than one hundred hours on type.

The mission was a local night-flight. The runway had center runway lighting, edge runway lighting, but no glide-slope lighting. The co-pilot had done some lousy touch and goes, so on the next approach, the AC decided to follow on the controls with his hands…! The co-pilot thought that the AC had control of the aircraft. The aircraft touched the runway and the FE reset the flaps as per normal and called "ready." At this time, nothing happened…nobody did a thing! As the aircraft approached the end of the runway and still nothing happened, the FE applied power and both pilots took the controls.

While they were arguing about who had control, they flew another visual pattern. They were still arguing when they turned onto final approach. By now, the AC was flying, not realizing that they were lining up with a road that crosses 200-metres from the approach end of the runway and at a 45° angle. He never turned the last 45°. As the pilot called for "flaps" and asked for the "pre-landing check," he was passing 300' and still well lined-up with the road.

The FE realized they were pointing at the road and not at the runway and he called for a "go-around." They did one more pattern to a full stop landing. I'm pretty sure that the discussion was continued on the ground. ◆



Murphy Was on a Holiday

While posted to a Tactical Helicopter Squadron some years ago, I was tasked with supervising a supplemental (supp) check. As luck would have it, (or perhaps Murphy), the supp check was a lengthy one. We were on exercise at the time; common sense dictated an early morning start to make the most of the daylight.

As I remember it, the supp check went reasonably well, and supply had the parts we noted for replacement. I could get half the crew away at a time for lunch, and it was not raining. We found ourselves finishing the supp after a long productive day, just as dusk was turning to dark. I was anxious to get my crew off to supper together. I asked two of the guys to check the tool kit and ensure that all the tools had been replaced. They completed this task in now almost total darkness and reported to me that all of the tools were indeed back in the tool kit. One of them signed the first column for the kit and I signed the second. Off we went to supper and a couple of beers.

The next morning most of my crew and I were tasked to fix a tricky snag on another helicopter. We picked up the same tool kit that we had used the day before and hauled it out to the aircraft we would be working on. The SOP's stated that upon opening the kit we had to do a tool check to ensure that everything was there before starting. Lo and behold, the kit was missing a 1/4 inch deep socket. At that point I got an unfamiliar queasy feeling in the pit of my stomach. My first instinct was to try and find the socket before anyone else knew it was missing. I sent a couple of guys over to the aircraft we had been working on the day before. They came back quickly and let me know that the aircraft was "gone." GULP

Now management was definitely going to find out! I sent the guys back to the spot where the aircraft we had worked on had been, in the hope that the socket was in the grass. I hurried over to see my supervisor to let him know what was going on. We alerted Squadron Ops who radioed the flying aircraft to land immediately. At this point, all the guys on my crew were on their hands and knees going through the grass with their fingers. No socket. The crew of the helicopter radioed back twenty minutes later to report that the socket had been located on the helicopter, and that they would continue with their mission.

It was a long day waiting for that crew to return so that I could offer my apologies. It was a long day that day, and many other days when I thought of what could have happened, but didn't. So, what went wrong? Well, first of all, obviously two people missed a socket. But why was it missed? I suppose you could chalk it up to fatigue and lack of light. Should I have signed off the toolbox? I trusted the guy who I signed for. He did do the check. The outcome would not have been different if it was he who signed the toolbox off as being complete instead of me. I could have just as easily missed the socket as the two people who checked the box if I had done the check myself. I think the system did work in this case.

SOP's were followed and the missing tool was noticed; granted, it was noticed too late to stop a helicopter from flying. But, it was noticed before anything untoward happened to the helicopter. The bottom line for me is…Murphy was on a holiday, and we were darn lucky. ◆

ATC Work and Assumptions Don't Mix

The flying was light that day and, as per usual, the morning was progressing fine with nothing out of the ordinary. The air traffic control (ATC) staff received a visual flight rules (VFR) flight-plan from Wolf 23A for a scheduled departure at 1400 hours. The intentions were to fly VFR from Gagetown to Miramichi, and then continue under instrument flight rules (IFR) to the destination airport, Moncton. The control tower personnel knew from the squadron's flying schedule that Wolf 23A would come back to Gagetown later that afternoon, but the flight plan for that part of the flight had not yet been filed. When Wolf 23A departed Gagetown, the ATC assistant entered the departure information in the electronic ATC movements (ATC MUST) program, and coordinated with the appropriate control agencies. As a reminder, the tower assistant included an entry in the ATC MUST program indicating an IFR arrival for Wolf 23A from Moncton to Gagetown with no time yet, assuming that the aircraft would come back IFR. This practice is not within normal operating procedures, since entries are made into the program only when official aircraft movement information is received. This is an important aspect because of search and rescue (SAR) implications.

Later that afternoon, Wolf 23A filed a VFR flight plan from Moncton to Gagetown. On departure from Moncton, the flight services station (FSS) personnel relayed an official VFR arrival time to Gagetown tower. Since an arrival entry was already made on the electronic page, the afternoon tower assistant entered the estimated time of arrival (ETA) in the appropriate box, assuming that the rest of the information was accurate. In actual fact, the flight rule was indicating an IFR arrival.

The tower assistant passed the arrival time on Wolf 23A to the aerodrome controller without specifying the type of flight. The aerodrome controller did not question this further, assuming that Wolf 23A was inbound to Fredericton for an IFR approach before returning VFR to Gagetown. Since Gagetown does not have IFR approaches, IFR inbound flights proceed to Fredericton to execute an IFR approach before continuing VFR to Gagetown. Coincidently, Wolf 23A executed a practice approach in Fredericton that day. After the aircraft was transferred over from Fredericton, the aerodrome controller's assumption was reinforced. In actual fact, the aerodrome controller failed to realize that it's impossible to receive an IFR arrival

from an FSS Agency, since there are no IFR approaches; consequently, the estimate received had to be VFR.

When the pilot terminated his IFR approach in Fredericton, he returned to Gagetown. The pilot was assuming that Gagetown tower knew that he (Wolf 23A) was on a VFR flight plan and therefore did not confirm with tower that the VFR flight plan would be closed. One hour after Wolf 23A's ETA, the flight was put on SAR alert. Fortunately, the communication search through Gagetown operations revealed that the flight was on the ground, safe and sound. Otherwise, all these assumptions would have been very costly — not to mention, very embarrassing as well! ◆

Sergeant Guillemette

The Groans of Self-Medicating

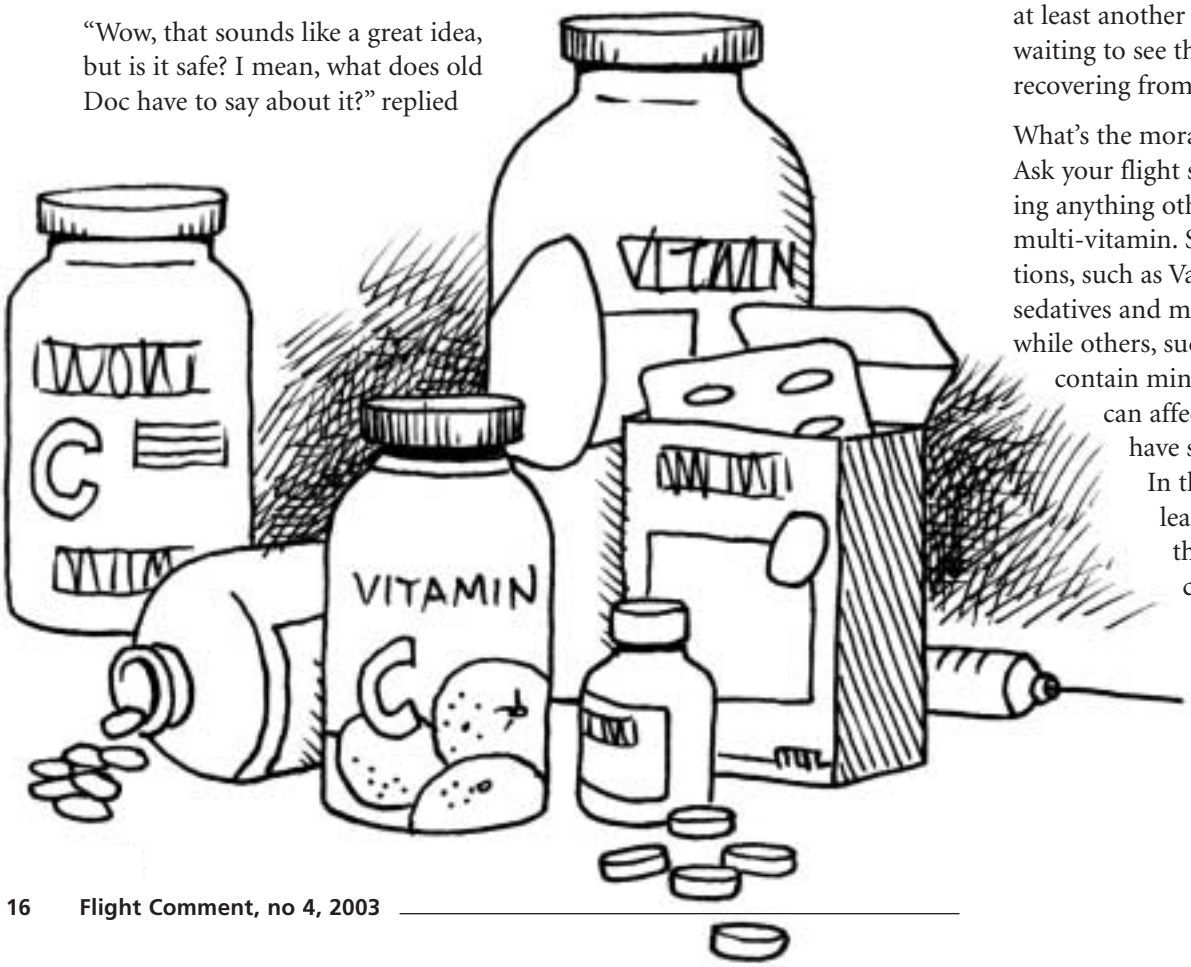
It was your standard trip across the pond for the crew of Hercules #419. The Aircraft Commander (AC) and the co-pilot were having a relaxed conversation. The co-pilot had just recovered from a bad flu that had grounded him for ten days and he was complaining to the AC about how he was always getting every cold or flu that came around. "Yeah, I know what you mean" said the AC in response. "I used to be the same way until a friend of mine recommended taking high doses of vitamin C. It's great. I've been taking 5000 mg a day for the last nine months and haven't had so much as a sniffle."

"Wow, that sounds like a great idea, but is it safe? I mean, what does old Doc have to say about it?" replied the co-pilot. "What are you talking about? It's just a vitamin. It's not like it's self-medicating or something" said the AC. Just then, the AC went as pale as a ghost and clutched his right flank managing a weak "you have control" to the co-pilot before spending the next three hours writhing around in pain until they could land in England and rush him off to the hospital. After spending several hours in an emergency room and having special x-rays, he was diagnosed as having several kidney stones.

Later, after returning home as a passenger, he went to see old Doc, the local flight surgeon. Upon hearing of his high dose vitamin C regime, old Doc wasn't too happy. The Doc informed him that the stone that he had eventually passed in his urine had been analyzed and it was composed almost entirely of ascorbic acid (or what is commonly known as vitamin C). The Doc continued to say that kidney stone formation is a known complication of taking large amounts of vitamin C. By not consulting a flight surgeon, the AC had caused his own incapacitation while piloting a CF aircraft. Also, the Doc told him, that because there were still more stones to be removed, the AC could expect to be grounded for at least another four months while waiting to see the urologist and recovering from the needed surgery.

What's the moral of this story? Ask your flight surgeon before taking anything other than a standard multi-vitamin. Some herbal medications, such as Valerian root, are sedatives and make you drowsy, while others, such as St. John's wart, contain mind-altering drugs that can affect performance and have serious side effects. In this story, the AC learned, the hard way, that self-medication can jeopardize flight safety. ◆

Captain Chapman
Flight Surgeon



Great Changes!

There have been many cuts in the aviation world. The main gist has been to try and accomplish tasks more efficiently and more cost-effectively. The introduction of the Griffon helicopter has embraced some of these new concepts and, in many cases, made definite improvements.

In one of these initiatives, it was determined that day to day aircraft servicing would change. Any servicing under two hours in length would now be the responsibility of the aircrew. Imagine, if you can, pilots refueling, flight engineers changing black boxes, the whole crew towing, and technicians not having to stand fireguard in freezing weather. Change is good and to see this type of change is not bad. After all, a helicopter is self-sufficient and therefore this concept is not far-fetched.

Recently, I had to question this change to some degree. I was exiting the hangar to cross the tarmac attending to business in the building across the way. A Griffon helicopter had been parked twenty feet from the door. I observed the helicopter closely in order to verify if it was about to start; rotors turning and hot engines gases is not a place to be. I saw no aircrew in sight, so I assumed the way must be clear. I walked by the aircraft at a distance of about ten feet and, to my surprise, the aircraft proceeded to give that familiar start-up whine. I quickly retreated back to the safety of the hangar until I could determine the intentions of the starting aircraft. It seemed that the aircraft required what is referred to as a "drying run" after an engine wash. A pilot carried out the ten-minute ground run. As per the new methods, a fireguard wasn't required, and, since no flight was intended, no other aircrew was required either.

What if I was near the tail rotor? What if a small fire had taken place? Worse yet, what if there was a fuel spill? The potential for an accident did exist. How fatal an accident in not one thing I care to imagine. Would a fireguard for the start sequence eliminate the potential for an accident? I think so. Would it cost that much in either technician time or aircrew time to stand guard, at least for the start? Not really. How much would we save in man-power or dollars preventing someone from walking into a starting tail rotor? The answer is that we could save a lot more compared to what it would cost. Maybe some of our great changes aren't all that great. ◆

Warrant Officer Kissmann

My Supervisor is (or so

As a young and recently qualified avionics (AVS) technician, life was good on the old and mighty CC-115 Buffalo aircraft. I was surrounded by so much technical experience that it was easy to fall into the mind-set that all I had to do was to go with the flow and nothing would go wrong. I figured that there was no way that, with so much experience, my supervisor would ever make a mistake. **WROOOOONG!**

One clear and beautiful summer day in the Quinte region, while I was busy doing a tow job, my supervisor was working hard on a departing aircraft snag on the ramp. Upon the completion of my tow job, my supervisor came to me in a hurry. He asked me to sign the first column on his work because the aircraft was departing immediately and his work required a signature before the departure was permitted. The warning bells should have come on but I remember thinking to myself that I ***should*** check the job before signing, but he was my boss. I thought about his twenty-plus years of experience compared to my measly five years and I also thought about the fact that he was my teacher; I considered him infallible. In addition, I felt that I might insult him if I questioned his technical ability. I know that you are thinking that I should not have signed it, but I did.

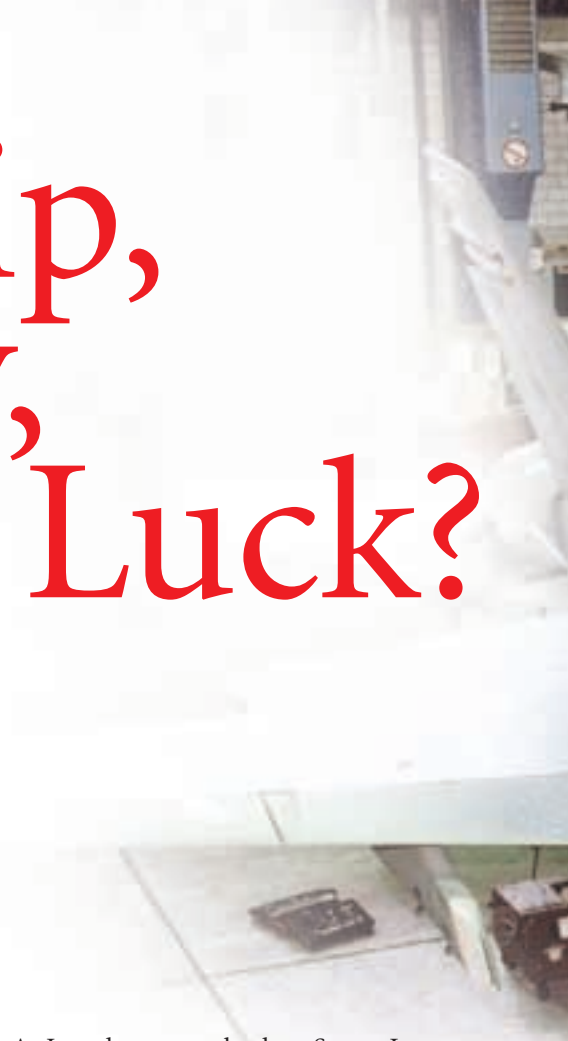
To my surprise, I was called into the Warrant Officer's office a few hours later. He asked me if I checked before signing. Of course, his next question was "why not?" Luckily, nothing happened to the aircraft, but I did get a well-deserved chastising. It certainly gave me a new perspective on what I should be concerned about…following directives and **always** being consious of safety! ◆

Master Warrant Officer Morin

Too Qualified To Make Mistakes!

I thought!)

Is it Friendship, Flight Safety, or Just Dumb Luck?



It was a few years ago, back when line servicing (LSO) and snags recovery (SRO) were two different identities. I was the NCO i/c of Snags on this particular night shift and I was busy. I had just taken the hand-over from the day shift and was getting debriefs from the crew i/c on the different snags that were in process. It looked like it was going to be a long night.

Snags had been working for about two hours and we didn't seem to be getting anywhere. As a matter of fact, flying had just finished and there wasn't a serviceable jet in the squadron. I was just starting to get a little concerned, as I knew there was a rather heavy flying schedule for the next day plus we were deploying six aircraft north. Just then, one of the crew chiefs asked me if I would come and do an independent check on a servo change that the day shift had carried out. "Sure, no problem, I'll just have a quick look at the L-14 and be right there." Looking through the 349's, I noticed that my old friend had signed for the installation. "Well, that settles it" I thought, "I don't have to re-check this person's work; after all, this person has had the top PER out of the squadron three years in a row."

Then I heard, "Sergeant, you better come quick, there's been an accident." I dropped everything and rushed to the scene and it looked bad. I saw a technician rolling around on the floor, holding his face, and there was blood everywhere. After a few minutes, we managed to get a pressure bandage on the victim and transported him to the base hospital. He had gotten what we call "speeder burn" just above the right eye. It had been a pretty common injury over the last few years so, other than a couple of stitches, a black eye, and a headache, he should return OK.

"Now…what was I doing?" Just when I remembered that I was signing off 349's so we could get some jets serviceable for the morning, the crew chief asked me to do the independent check so he could get the panel back up. My first thought was to tell him to just go ahead and put the panel back but, again, I heard "Sergeant, we've had another accident." I arrived to see a technician being sat down and steadied. He had about a three to four inch gash across his forehead; it seems that he was in a rush and ran into a flap. We applied the same first aid as the last guy and transported him to the hospital also. Once again, the crew chief was asking me to do the independent check. It was on my way back to the Snags desk, so I got up on the aircraft and checked the servo, the washers, the bolts, and the cotter pins. "OK, we're good to go!"

As I made my way back to Snags, I was thinking "two technicians hurt; still no serviceable jets; this is going to be a long night." As fate would have it, as I walked into Snags there was the Canadian Forces Technical Order (CFTO), lying open on a table, of the servo I had just checked. I took a quick glance and realized that that was not what I had just seen at the aircraft; the washers, bolt, and nut were the other way. I went back to the aircraft and had them de-panel just so that I could be sure of what I had seen. They were not happy to undo work that they had already done, but, rank has its privileges. The panel was removed and, sure enough, the servo was connected wrong and was not in accordance with the CFTO. To make a longer story short — a short time earlier I was about to sign blindly because the job had been carried out by a friend and I felt that I was under the gun to get serviceable jets on the line.

At that moment, I realized that I was not the only one that believed we were under pressure. I took it upon myself to shut the entire snags section down and had everyone convene in the canteen. I took just about an hour and explained that yes, we needed to put rubber on the ramp but not at the expense of getting people hurt. I suggested that we slow down and do what we do best…fix jets safely. We made our numbers that evening without further incident and, to this day, I often think back to that evening and all the "what if's" that could have happened. ◆

Warrant Officer Adams

Aircraft Icing: An

Autumn, with its beautiful colours and crisp air, marks the beginning of the aircraft icing season. The weather patterns in Canada provide for one of the most prominent icing seasons in the world, especially along the coasts. The icing condition is a hazard that most pilots, especially Canadian ones, are exposed to and understand. A refresher into the meteorological, as well as the technical, aspects of flight in known icing is periodically warranted, and fall is the appropriate time of year to reflect on the engineering and operational challenges that aircraft icing brings to the aviation community.

Weather patterns with considerable amounts of moisture can be found over most of eastern Canada and, also, over the western coastal areas. These conditions, coupled with a cold cloud top, make for perfect icing conditions since aircraft icing occurs mostly in clouds. It is true that it can also happen in freezing rain or drizzle and, unfortunately, in these two conditions, none of the current ice protection systems can deal with them, so they should be avoided, where possible.

Icing has been taken seriously for a long time, as proven by this Transport Canada directive dated 1994, http://www.tc.gc.ca/civilaviation/maintenance/aarpc/ans/b017.htm. Despite all available information, incidents directly related to icing are still reported by Transport Canada as late as December 2001. See the following incident report for details (http://www.tc.gc.ca/civilaviation/systemsafety/newsletters/tp185/4-01/294.htm). This wealth of information on aircraft icing, de-icing, and anti-icing fluid methods masks an authentic problem with modern aircraft design. It is true that the general concept of aircraft icing and its effect on the aerodynamic properties of aircraft is relatively well understood. However, it is much more difficult to adequately predict the specific effect that exposure to icing will have on a given flight. This is due to the number of variables involved in the determination of ice accumulation on exposed and unprotected surfaces.

For this reason, specific de-icing and anti-icing equipment and extensive flight-testing of prototype aircraft are required before a plane may be allowed to fly in icing conditions. Engineering oversight of an aircraft design by a national organization requires that the aircraft flight manual, equipment list, and design substantiation for flight in icing conditions be reviewed for accuracy and completeness before the aircraft is permitted to fly the Canadian skies. In the case of the Canadian Forces (CF), this organization would be the Directorate of Technical Airworthiness (DTA). This effort typically takes place during the airworthiness certification of the aircraft. As for every other technical review performed during airworthiness certification, the aircraft design must be validated through design analysis, testing, or similarity to meet the specific airworthiness requirements.

Aircraft Design Perspective

Each aeronautical design must have a basis of certification where the airworthiness requirements are found. Engineers use them to guide their overall and detailed design in order to achieve a basic level of flight safety. It is commonly accepted that the airworthiness standard form a set of historical lessons learned, and that they must always be met or exceeded, in order to design a safe aircraft.

In the case of the CF, two large families of airworthiness requirement documents are used. These are the military specifications and the civilian airworthiness regulations. Military specifications tend to be more specific in their intent and applicability to equipment, hence they are more numerous and are from more varied sources. Civilian specifications, on the other hand, tend to be more general and uniform in nature, allowing only for small regional variations. It would then make sense for a review of the present characteristics of the general pitfalls associated with the design of aircraft, to focus on the civilian requirements.

Federal Air Regulations (FARs) are the most widely distributed, used, and understood of such civilian airworthiness requirements. Canadian Air Regulations (CARs), as well as Joint Air Regulations (used in Europe) essentially duplicate FARs, while adding some regional specific requirements. FARs, title 14, parts 23, 25, 27 and 29, deals with aircraft and rotorcraft certifications. FARs 25 outlines the requirements for flight into known icing conditions and are summarized as: "The aircraft must be usable under icing conditions in its entire flight envelope, with acceptable handling qualities. This means, for example, that the windshield must remain clean, and that the wings, tail, propeller, and drive train be free of ice and that the engine may operate with ice accumulation on its air intake. A very specific requirement exists for instrument flight rules (IFR) aircraft. These aircraft must have a heated pitot tube, and the static port must not be affected by ice accumulation."

To prove that the aircraft can operate as stated above, analysis and flight tests are required. The flight tests are specified for given meteorological conditions, ranging from flight in dry weather to flight into maximum icing conditions. The usage of artificial ice forms are commonly used to reduce the time required to find actual icing meteorological conditions. During these tests, the effectiveness of the de-icing or anti-icing systems is carefully reviewed.

Regulations require that a means be provided to identify ice on the critical parts of the airplane. For night operations, this usually takes the form of external lighting. The airplane flight manual (AFM) must also describe the means of determining ice formation and must contain information for the safe operation of the airplane in icing conditions. The AFM must also describe the kinds of operation authorized (e.g. visual flight rules (VFR), IFR, day, or night) and the meteorological conditions (e.g. icing) to which the operation of the airplane is prohibited. The minimum equipment list must also reflect the aircraft's capability to fly in icing condition.

Armed with these guidelines, the CF Technical Airworthiness Authority (TAA) reviews the designs that are submitted to the CF through the various Project Management Offices and Aircraft Engineering Project Management cell of DND. It is after a review of each requirement with the aircraft manufacturer, that the TAA accepts or rejects the design with its proposed limitations. The limitations of the aircraft are then tightly controlled by the basic aircraft design. This means that when the aircraft is flown outside of the limitations listed in it's aircraft operating instructions (AOI), it is really not safe for flight, according to the guidelines and experiences accumulated in more than 100 years of flight.

One such lesson learned is to have clean wings prior to take off. This is referred to as the "clean wing" concept. Failure to do this can have disastrous consequences on aircraft performances and handling characteristics. Small deformations of the wing contour due to ice, snow, or from other provenance can have a large impact on the aircraft stall characteristics. Figures 1 and 2 demonstrate what happens after a limited exposure to icing conditions. The ice formed on this aircraft drastically increased the stall speed. The clean wing concept, thus, assures the pilot that the aircraft will operate safely, as it should. It must be emphasised that the de-icing or anti-icing systems are designed to cope with cloud icing, not with freezing rain or drizzle.

To clean the aircraft wings of snow and ice accumulations, mechanical means have been successfully used and are usually

Figure 1

Figure 2

recommended by the manufacturer. This method, however, is not convenient when dealing with large aircraft, because of its manpower and time-consuming nature. Operators were provided with a faster method to clean aircraft wings and fuselage through the use of de-icing fluids. These fluids are a mixture of hot water and Glycol, which provides a means to efficiently remove ice and snow from aircraft surfaces. Unfortunately, the mixture can either freeze or stay on the aircraft structure if not employed properly. In either case, it has the potential of changing the aerodynamic properties of the plane, so these products need to be used carefully and knowledgeably.

Research and developments into de-icing fluids led to the introduction of anti-icing products. These products are applied cold and are designed to remain on the aircraft until departure. Since the fluid sticks to the aircraft to provide protection against moisture, when cleaning it off just prior to take-off, any precipitation that might have accumulated while it was on the aircraft comes off with it. Most anti-icing fluids are specified in such a way that, for safe usage, the aircraft must rotate at a minimum of 120 knots. This airspeed allows for enough stress to be exerted on the wings to clear them of any fluids before taking flight. The protection afforded by anti-icing fluids is then limited to the time prior to that defined in its hold-over table (HOT) or prior to take-off, when the fluids leaves the aircraft. It is important to realize that the plane is without protection from the time the anti-icing fluids passes the time limit published in the HOT, or from the time when the fluid is flowing off of its wings. Severe weather can reduce the HOT and pilots are still required to confirm that the aircraft is clean, prior to departure. Other mechanical or electrical means, as defined by the aircraft manufacturer and recorded in the AFM or AOI, must be activated to prevent further snow and ice accumulation once airborne, until such time as the icing condition is no longer an issue.

Training is also an important issue with ground de-icing and anti-icing. De-icing and anti-icing fluids have properties that depend on water content; ice and snow contaminant can precipitate the fluid and re-freeze on the surface of the aircraft. It is, therefore, important for the ground crew to be trained in the proper application technique. They also must be trained in recognizing changes in the properties of the fluid. Flight crew must also be cognizant of the effect that these fluids may have on their aircraft if they remain on the wings or if they are improperly applied, etc. Transport Canada has issued guidance material for both ground crew and aircrew training, and this material is presented in the reference section at the end of this article. ◆

Icing protection and icing control is a complex engineering problem that requires the operators to closely follow the procedures describe by the manufacturer. Anything else has the potential of endangering the safety of the flight and must be cautiously considered. It is also important to understand the limitations of both airborne and ground de-icing and anti-icing principles to maintain a high standard of flight safety. The following information is a list of reference material that the reader may want to review:

- *Training ("When in Doubt" series);*
- *Ground crew (Transport Canada Publication) TP 10647;*
- *Aircrew (Transport Canada Publication) TP 10643;*
- *De-Icing and Anti Icing (Transport Canada Publication) TP 9928;*
- *Airborne de-icing equipment AC0 147 http://www.tc.gc.ca/civilaviation/commerce/circulars/AC0147.htm*
- *Certification requirements:*
- *FAR Certification requirements http://www.access.gpo.gov/nara/cfr/cfrhtml_00/Title_14/14cfrv1_00.html*
- *AC25-1419-1 (Flight in known icing research)*
- *NASA: http://icebox.grc.nasa.gov/ext/facilities/IRA.html*
- *Europe: http://www.cordis.lu/transport/src/eurice.htm*

Captain Graveline
Directorate of Technical
Air Worthiness
Flight Science — Fixed Wing
Aerodynamics Specialist

MAINTAINER'S

HUMAN PERFORMANCE IN MILITARY AVIATION

You probably know by now that everyone connected to flying operations will receive Human Performance in Military Aviation (HPMA) training. You may wonder why we are receiving this training. The reason is simple. How we perform, or not, affects all aspects of our lives, including the work we do on or around military aircraft. Did you know that personnel cause factors account for approximately 50 % of all the Flight Safety (FS) occurrences we have in the Canadian Forces (CF)? This percentage is roughly the same year after year, and it is high time that we become aware of how our actions can have unexpected reactions, some of them serious.

I will start with a few statistics. As you can see in the following graphs, the cause factor "Personnel" was identified as contributing to 49% of the occurrences in 2000, and 54% in 2001 and 2002.

These statistics were probably an eye opener for many of you. It certainly was for me when I started to gather the data. However, percentages do not mean much by themselves. To put these numbers into perspective, in 2002, we had 2669 occurrences entered in the Flight Safety Information System (FSIS). In that 12-month period, approximately 1400 of the occurrences were caused, in part or totally, by a person or persons: That is about 116 occurrences a month, 3 a day! Now, that should be enough to make you think a little bit about our role, as technicians, in the safety of our aircraft fleets.

One of the major goals of the HPMA program is to help us understand how our performance, and the team's, plays an important role in overall operational effectiveness. This goal will be achieved through knowledge, skills and attitude. HPMA coordinators will facilitate this process but it will be up to each individual to develop further these tools in order to become professionals focused on maintaining maximum operational effectiveness.

As you can see, HPMA is not a Flight Safety program, although it complements it: HPMA focuses on performance, FS, on safety. However, both programs have one goal in common, which is to see the number of aviation occurrences caused by human factors decrease. Another positive aspect HPMA will bring to the military aviation community is that this training is standardized, and everyone will receive the same course. The program allows some flexibility, however, since the course can be tailored to each community's (meaning fleets) specific needs.

So, how will HPMA help decrease FS occurrences? It will not be a direct result of the program, but a by-product of the changes in the way we work. By getting us to adopt four simple steps in our daily activities, we will become more conscious of the possible outcome of the course of actions we choose. In other words, it will make us slow down and think before we act. Here are the four steps, which HPMA training will cover in details:

1. Be **aware** of the surroundings and potential hazards.
2. Think of the **implications** of the situation and the possible choices.
3. Formulate a **plan** based on steps 1 and 2.
4. **Act** on that plan.[1]

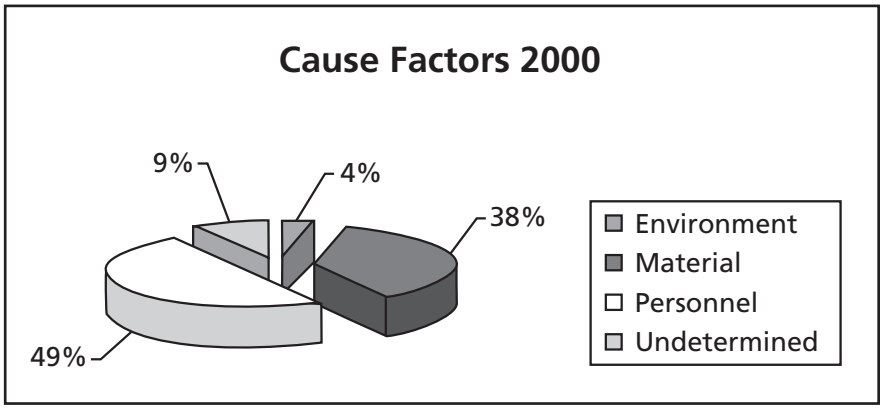
One important aspect of the HPMA program I would like to put emphasis on, however, is that the team concept, at all levels, plays an important role in increasing operational

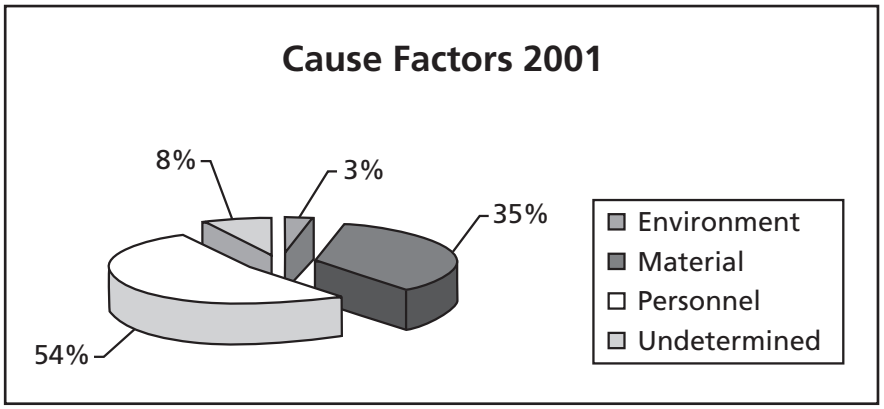
CORNER

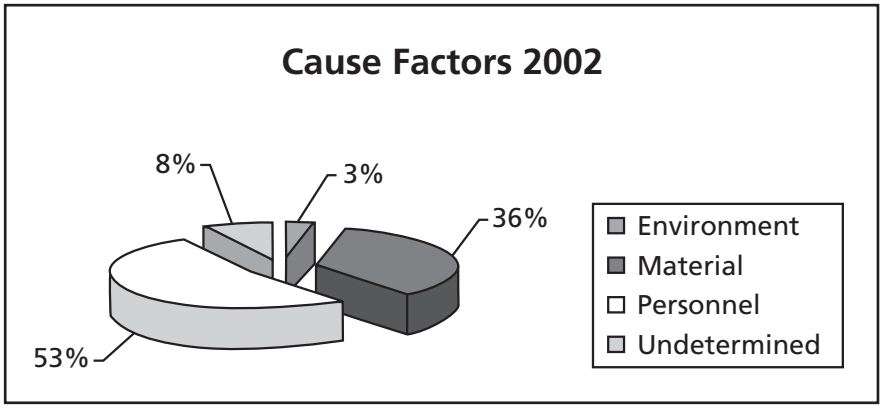
effectiveness. This is why the same training will be given to all aircrew, maintenance and aerospace control (AEC) personnel. To help make HPMA an integral part of the Canadian Forces, it is being integrated into the basic occupational schools, making it part of a new technician's training from day one. The same is being done for aircrew and AEC personnel. Furthermore, everyone else involved with aircraft operations, such as Squadron clerks, fuel tender drivers, supply technicians, etc., will be encouraged to attend an HPMA training session. It is hoped that, eventually, a culture change will occur throughout the air force, and that HPMA principles will become a way of life.

One last thing. Your attitude towards this program is paramount to its success. Keep an open mind when you go for your training session. You may be pleasantly surprised! ◆

Sgt Anne Gale
DFS 2-5-2-2







For more information on the Canadian Forces HPMA program, consult the following web site: http://winnipeg.mil.ca/cfs/HPMA/hpa_e.htm.

I would like to thank Major Daryl Collins, Operational Training and Human Factors (OTHF) Flight Commander, for his suggestions while I was writing this article. You can find out how to contact Maj. Collins by consulting the HPMA web site.

[1] HPMA Coordinator Training Manual, July 2003. Central Flying School.

Good Show

CAPTAIN ANDRE DAOUST
CAPTAIN STEVE PARRY
CORPORAL LIZ WHITE

In August 1994, Captain Parry, Corporal White, and Captain Daoust of 408 Tactical Helicopter Squadron were flying a routine training mission between Hinton and the Namao air base. While piloting their Twin Huey helicopter through the mountains, about twenty-five kilometres west of Edson, they picked up a distress call from a twin-engine Beechcraft airplane.

The plane, which the aircrew rapidly calculated was about eighty kilometres away, had just clipped a tree and damaged its left wing. The pilot tried to climb out of harm's way but became disoriented in the low clouds. The pilot radioed a Mayday call on the international distress frequency. The crew recognized that someone needed help and they also realized that the pilot didn't know where he was. Parry's crew radioed the pilot to keep climbing out of the heavily treed mountain range. The crew crudely tracked the Beechcraft by monitoring electronic surges in its radio transmissions and guided it to within range of the Edson airport's navigational beacon.

As the pilot neared the airport, the plane's left landing wheel retracted. The Twin Huey crew flew beside the plane as it prepared for the emergency landing. The Beechcraft landed, pulled off on to the soft grass and spun 180 degrees before the three occupants deplaned with relieved looks and big smiles. Without the professionalism and assistance of Captain Parry, Corporal White, and Captain Daoust, the combination of poor weather, rugged terrain, and a damaged aircraft could easily have caused a fatal crash. ◆

SERGEANT DOUGLAS ANDERSON
MASTER CORPORAL KAREN MCCOY
CORPORAL CHARLES MESLAGE

To facilitate implementation of a special NDHQ authorized repair, Master Corporal McCoy and Corporal Meslage were directed to remove, inspect, and re-install the main rotor assembly "butt cap" on a CH146 Griffon helicopter main rotor blade. While removing the blade, they noticed an unusual indentation in its upper surface. Working as a team, they completed a detailed inspection of the upper and lower blade surface and verified their findings with all available technical documentation. According to the documents, the main rotor blade assembly was completely serviceable.

Not satisfied with the result, Master Corporal McCoy informed her immediate supervisor, Sergeant Anderson, who then verified the indentation and, despite the unbroken painted surface, knew that something was not correct. Sergeant Anderson instructed the two technicians to removed the paint from the suspect area, which resulted in the discovery of a three-inch crack. Immediately following this discovery, Sergeant Anderson instructed his crew to inspect all sixty helicopter's main rotor blades. This additional inspection revealed thirty-eight main rotor blades with similar defects. The result of a fleet-wide maintenance alert identified seventy-five affected aircraft.

Sergeant Anderson, Master Corporal McCoy, and Corporal Meslage demonstrated outstanding professionalism and technical skill in discovering a potentially serious condition. In the absence of detailed technical information, they relied on their experience to ensure this situation received the appropriate level of awareness. Their superb attention to detail and perseverance is to be applauded for ensuring that this hidden defect did not go unnoticed and that seventy-five out of ninety-eight aircraft received the repairs they needed to ensure their airworthiness. ◆

For Professionalism

CORPORAL DAVE MACLEOD

While performing a propeller out-of-sequence inspection on Aurora #140102 in March 2003, Corporal MacLeod noticed dried hydraulic fluid below the dipstick. A closer inspection revealed a loose mounting bolt on the valve housing cover. Although the bolt could be torqued without removal, he immediately recommended that further inspection be carried out. After removal of the upper afterbody, he discovered that all the valve cover attaching hardware, two bolts, and three nuts were also loose and had backed off twenty to fifty per cent.

Had this fault remained undetected and had the valve housing cover lifted off during operation, it would have removed the sole means of controlling the propeller during normal and emergency operation. The loss of hydraulic fluid through the valve cover would have affected the ability to feather the propeller during emergency shutdown.

The potential existed for loss of propeller controls and complete catastrophic failure during the low-level flights, typical of Op Apollo operations. Corporal MacLeod's diligence during the performance of routine maintenance and his persistence in investigating this irregularity averted a considerable threat to the safety of aircraft and its crew. Corporal MacLeod's actions clearly displayed a superior professional attitude and he is to be commended for his attention to detail, which undoubtedly prevented the potential occurrence of a serious aircraft accident. ◆

CORPORAL ALBERT CAMPHUIS
MASTER CORPORAL LISE POUPART

Corporal Camphuis and Master Corporal Poupart are both aviation technicians who were formerly safety systems technicians. While in Trenton on 13 June 2001, they were tasked to carry out periodic inspection card #AF-78 on Hercules aircraft #130338. While performing the survey of the under deck area, they discovered both the pilot and co-pilot's aileron control cables were routed incorrectly. Instead of being routed through the stringer, the cables were routed under the stringer.

Additionally, investigation revealed that the last known maintenance on those cables was in 1998. Since that time, the aircraft had undergone numerous periodic inspections as well as an avionics upgrade that required work to be done in that area. The problem was missed many times previously.

The routing of these cables looked almost natural, and without Corporal Camphuis's and Master Corporal Poupart's in-depth knowledge and experience of both the aircraft and the proper cable installation, the routing would have likely been left in its current position. The technical order for routing of cables does **not** show the correct routing; it merely mentions that there should not be any binding of the cables.

Under certain conditions, the incorrect routing could have had disastrous consequences. If the cables had been left as found, a very serious emergency situation could have arisen. The professionalism and attention to small details displayed by both Corporal Camphuis and Master Corporal Poupart certainly contributed to eliminating a serious threat to the safe flight of this aircraft. ◆

For Professionalism

SERGEANT JEAN-PIERRE LATREILLE

On 19 June 2001, after completing a low-level mountain training flight, the Hercules crew proceeded to Quebec City to perform an engines running offload (ERO). During the ERO, Sergeant Latreille, the flight engineer, proposed and conducted a post-flight inspection due to the numerous birds observed on the flight.

While performing the visual inspection, Sergeant Latreille discovered that a bird had impacted the main fuselage with no evident damage. He then found a panel that was peeled back, approximately six inches, on the underside of the left wing, so he requested that the aircraft be shut down to permit further investigation. On closer examination, he discovered that a screw was missing from the lower left joint cover installation. Sergeant Latreille's immediate concern was to determine the cause of this minor malfunction. His further investigation revealed a loose lower wing bolt, which secures the wing to the aircraft fuselage.

Sergeant Latreille's initiative in recommending the precautionary inspection during the ERO, exemplary attention to detail, as well as his tenacity in finding answers resulted in the discovery of a serious aircraft malfunction. His actions surely prevented the aircraft from flying in a potentially disastrous condition. ◆

MR. RON CYR
MR. DOUG BREAU
MR. CLAUDE GUITARD

During 14 Wing's twelve-month and 400-running hour inspection of Cormorant CH-149903, three Industrial Marine Products (IMP) technicians, Mr. Cyr, Mr. Breau, and Mr. Guitard, discovered lag dampers filled with improper fluid. Although neither of these fluid checks are a requirement, technicians became concerned with the general characteristics of the fluid associated with one lag damper. They carried out further sampling of all five dampers and also, eventually, those held in stock. These tests revealed other instances of suspect fluid.

Upon supervisory and managerial notification, the fluids were sent for analysis by Defence Research and Development Canada (DRDC) Atlantic. Testing confirmed that the samples contained fluid not meeting the minimum requirements of MIL-PRF-5606 hydraulic fluid. IMP, calling for servicing of all installed, as well as all spare, lag dampers, issued a supplementary inspection of all CH-149 Cormorant aircraft. As a result, numerous lag dampers were reported as containing a similar suspect fluid. Further investigation by product service representatives revealed that the Italian supplier of lag dampers to this aircraft type must now amend their processes with respect to pre-installation maintenance requirements.

The technicians' diligence in immediately following up and investigating this lag damper fluid anomaly was notable. The consequence of this situation going uncorrected could have been severe. Mr. Cyr, Mr. Breau, and Mr. Guitard demonstrated commendable extra effort and a superior professional attitude toward aircraft maintenance. ◆

SERGEANT REGIS FRANCOEUR

Sergeant Francoeur is a flight engineer employed at 429 (T) Squadron. On 26 February 2003, he was conducting a post-periodic pre-flight check on Hercules aircraft #130326 at 8 Wing Trenton. During this check, he found that the skin on the #1 quick engine change unit (QECU) was buckled. This was extremely difficult to see and had previously gone undetected. The QECU, which was out of alignment and damaged beyond the capabilities of first line repair, was sent to the contractor for overhaul.

Had this damage continued to go unnoticed, further damage to the QECU and, possibly, to the aircraft structure could have occurred. As a result of his professionalism and his keen eye, Sergeant Francoeur was responsible for the discovery of a serious flight safety hazard and for preventing further damage to the aircraft. ◆

MASTER CORPORAL MIKE MELANSON

While carrying out a CC-130 Hercules wheel assembly build-up, Master Corporal Melanson noticed that the fuse plug assemblies identified as CC-130 did not all appear to have the same core diameter. Additionally, there were two types of fuse plug assemblies located in the same supply location. Further investigation revealed that the incorrect fuse plug assembly belonged to the CT-133 aircraft.

Master Corporal Melanson quickly withdrew all the incorrect stock and carried out an inspection of all built-up spares. He also immediately informed his supervisor and 413 Squadron flight safety personnel of the situation. Upon investigation by flight safety personnel and NDHQ Ottawa, it was revealed that this problem not only existed in 14 AMS, but at other units in Canada as well.

Due to the seriousness of the situation, two special inspections were issued. Master Corporal Melanson is to be commended for his quick action and his close attention to detail. His persistence and professionalism prevented a potentially catastrophic tire explosion, deflation, or related incident. ◆

MASTER CORPORAL ROBERT KERR

While preparing an aircraft for a post periodic ground run, Master Corporal Kerr noticed that the shroud seal on the adjacent aircraft, CF188743, was peeling away from the left leading edge flap. Master Corporal Kerr elected to check further and, on closer examination, he discovered that three rivets had lost their hold. Master Corporal Kerr immediately halted the preparation on the aircraft post periodic ground run. He notified his supervisor of the problem with aircraft CF188743 and made the appropriate unserviceability entry on the CF-349 form, placing the aircraft unserviceable. A closer investigation, done later, revealed that the left leading edge flap shroud hinge was, in fact, broken in half.

CF188743 was scheduled to fly that day and the quick response of Master Corporal Kerr may have prevented the aircraft from going flying with a potentially dangerous flight control malfunction. His actions and attention to detail in putting the aircraft inoperative could have saved catastrophic effects, had the leading edge flap failed. ◆

For Professionalism

MASTER CORPORAL DEAN HOLBEN

On 11 February 2003, Master Corporal Dean Holben, an aviation technician from 441 Tactical Fighter Squadron, was carrying out a post flight inspection on CF-188740 when he discovered a liquid oxygen (LOX) leak on the aircraft. His initial observation was that the LOX converter clamp was not securely fastened. Even though Master Corporal Holben suspected that the converter was the most likely cause of the leak, he investigated further.

He decided to remove the converter and inspect the entire oxygen system. It was during this thorough investigation that Master Corporal Holben discovered that the cause of the LOX leak was the aircraft's oxygen system and not the converter. It is of importance to note that there was an operational push to get this aircraft on state as soon as possible as it was one of the Quick Reaction Alert aircraft being utilized in the Op Noble Eagle role. There are very strict guidelines as to when an aircraft has to be returned "on state."

If not for the professional and mature attitude of Master Corporal Holben, the Hornet may have simply received a new LOX converter and launched again. This could have put the pilot at risk of suffering from hypoxia with the possible loss of life and aircraft. Without Master Corporal Holben's outstanding initiative and problem solving approach, this condition could have had devastating consequences. He is to be commended for his outstanding display of professionalism and alertness as well as his dedication to the safety of the mission. ◆

MASTER-CORPORAL BARRY LITTLE

While deployed to Task Force Bosnia-Herzegovina Helicopter Detachment, Master Corporal Little was tasked to participate in a 3000-hour airframe inspection on Griffon #146499. During the cabin roof survey, his attention to detail allowed him to notice a small thread from the protective sleeve of one of the main generator wires. He decided to follow up this otherwise unremarkable detritus to discover that the hidden side of the insulation had numerous areas of localized damage, many of which extended into and directly exposed the copper wire bundle.

Subsequent investigation revealed that the damage was most likely caused by the removal of a panel on the cabin roof two years earlier that required several rivets to be drilled out. During the drilling, the bit likely came in contact with the main wire several times. Considering the high amperage with which this wire is regularly energized and the exposure of the bare wire, it is remarkable that electrical arcing and, indeed, a fire had not already occurred.

Master Corporal Little's great persistence and professionalism while performing the survey of the cabin area of Griffon #499 was instrumental in preventing a serious failure of the No. 2 starter/generator system. His decision to follow up on this otherwise unremarkable clue and discover the true nature and extent of the damage shows the initiative and dedication he puts into his job. It also demonstrates the importance he places on the CF flight safety program. Had Master Corporal Little not proceeded beyond what was required in this area, a serious flight safety incident most surely would have occurred over time. ◆

CAPTAIN DAVE SCHNEIDER

On 13 August 2002, Captain Schneider was controlling the outer runway from the 15 Wing Control Tower, when a student solo pilot contacted him and requested clearance for a practice forced landing (PFL). Captain Schneider gave clearance and provided a mandatory gear check with an affirmative response from the student pilot. Although not required by regulation, Captain Schneider made a visual check of the aircraft from the difficult vantage point of short final on the outer runway. From his verification, he determined that the gear was, in fact, not down as indicated by the student pilot. Captain Schneider promptly instructed the student to carry out a missed approach, narrowly avoiding a gear-up landing. The pilot later declared an unsafe gear emergency, requiring visual confirmation by another aircraft prior to carrying out a straight-in, full stop landing.

Captain Schneider's outstanding situational awareness and prompt actions prevented a potentially serious gear-up landing accident, and the potential loss of both aircraft and personnel. ◆

MR. AARON LEGGETT

Mr. Leggett is an aircraft maintenance engineer at 3CFFTS in Portage and, in January 2003, he was carrying out a routine five-year maintenance inspection of the C-90A King Air. While he was examining the wing attachment bolts and fittings, Mr. Leggett saw what appeared to be a hairline crack on the left lower forward wing spar attachment. He cleaned the area and carried out a liquid penetrant inspection. This particular assessment proved what he had suspected. The defect was definitely a crack, radiating outboard and upward on the wing spar attachment lower fitting.

This area is not specifically within the scope of the inspection and is a difficult area to view clearly. This finding required that the main wing spar be replaced as well as a full re-inspection of the C-90A fleet and notification to Raytheon Aircraft and Transport Canada. The manufacturer has had no previous reports of defects of this nature in this area and is now in possession of the spar assembly to carry out further tests.

Through his perseverance, dedication, and professionalism, Mr. Leggett prevented a possible catastrophic failure and loss of aircraft and personnel. ◆

MR. MILES MCMILLAN

On 10 December 2002, Mr. Miles McMillan, a Bombardier Aerospace Servicing technician at NATO Flying Training Centre (NFTC) Moose Jaw, was assigned as the start man for CT-155208, an NFTC Hawk aircraft. Following the start, the pilot proceeded with the flight controls check. During this check, Mr. McMillan noticed a subtle difference in the appearance of the gas turbine starter (GTS) access panel. This access panel is very difficult to see, as it is located on the top of the fuselage, aft of the cockpit, and directly in front of the rudder. It is an area that is not documented for inspection on start and its condition had been unobserved prior to the start sequence.

Mr. McMillan immediately requested a qualified aircraft technician to further investigate the panel's integrity. Subsequently, an initial flight safety occurrence report was raised. During the aircraft technician's investigation, eight of the panel fasteners were found improperly secured. The panel was properly secured and the aircraft was released for flight without further incident.

Mr. McMillan's attention to detail, combined with his superior work ethic, likely prevented an in-flight loss of the GTS panel and a potentially hazardous in-flight emergency. Mr. McMillan's diligent performance is demonstrative of his outstanding professionalism and his commitment to the flight safety program. ◆

FROM THE INVESTIGATOR

Aircraft Occurrence Summary

TYPE: **Schweizer 2-33 C-GFME**

LOCATION: **Picton, ON**

DATE: **31 July 2003**

The standards instructor pilot (IP) and the Air Cadet student were participating in the Central Region Air Cadet Gliding School. This was the IP's third launch of the day at the end of the fourth week of gliding training. The flight was the student's pre-solo check ride and required the student to fly the entire flight with minimal verbal input from the IP. Shortly after take off, the student failed to adequately maintain proper glider postion behind the tow-plane. After a significant amount of slack developed in the tow-cable, the IP took contol of the glider. After a quick re-assessment of the situation, the pilot believed the potential existed to either snap the cable, upset the tow-plane, or have the cable back-release from the glider; he elected to release the tow-cable at approximately 50 feet above the treetops. The glider climbed to 100 feet at which point the IP set up for an approach to the only useable field amongst the departure-end trees. The glider's left wing struck a large tree12 feet above the ground just prior to touchdown. The glider pivoted around the tree and came to rest in an upright position on the ground, oriented 160 degrees to the left of its final flight path. The student and IP exited the aircraft uninjured and contacted an overhead tow-plane via radio.

The aircraft received "A" Category damage. Extensive damage to the left wing, particularly the leading edge, was noted. The outboard section of the left wing was folded forward in the horizontal. The right wing did not appear to have suffered damage externally, however, it did show evidence of severe skin deformation. Flight control surfaces on both wings were seized. The cockpit remained intact and its habitable space was not compromised. Minor cracking of the overhead cockpit canopy and numerous punctures of the glider's skin were noted. The tail section's skin and longerons were deformed.

The investigation is focusing on several human factors issues, slack tow-cable techniques, and runway departure-end obstacle clearance heights. ◆

FROM THE INVESTIGATOR

Aircraft Occurrence Summary

TYPE: Schweizer 2-33 C-FEAF

LOCATION: St-Jean, Quebec

DATE: 8 July 2003

The instructor pilot and the Air Cadet student were participating in the Eastern Region Air Cadet Gliding School. This was their first launch of the day and the second of the camp. The objective of the flight of the flight was to complete Lesson Plan Two, which consisted of the instructor demonstrating a number of different manoeuvres and attitudes prior to returning to the circuit for landing. The area work went as planned and the accident glider with the instructor flying returned to join the circuit at approximately the mid point of the downwind leg at 1300' ASL. The accident glider was followed in the circuit by another glider, which had joined at the upwind point of the downwind leg at 1150 ASL. Shortly after establishing on the final approach course for Runway One the accident glider was observed to be lower on approach than the following glider, which by this time had caught up the accident glider and was lined up for Runway Two. The Instructor and student in the accident glider felt a downdraft and when the instructor realized that she could no longer clear the tree line on the approach path retracted the spoilers and attempted to complete a 180 degree turn to the left in order to effect landing in a field to the left of the glider. During the turn the glider impacted the ground with the left wing, cartwheeled and came to rest in a recently sowed farmers' field. The instructor exited the glider so as to assist the student in getting out of the cockpit. A passing ambulance rendered medical assistance and transported both the instructor and student to the local hospital. Both suffered minor injuries.

The aircraft received A Category damage. Both wing tips contacted the ground, the left wing broke in two pieces at the inboard end of the aileron, and the underside of the nose cone was pushed inward .The right wing tip fairing received minor damage and the wing itself buckled at the inboard end of the aileron. The rear fuselage bent at the midpoint.

The investigation is focusing on the rates of decent flown in the circuit and the downdraft experienced by the pilot on final approach. ◆

FROM THE INVESTIGATOR

Aircraft Occurrence Summary

TYPE: Hornet CF188732

LOCATION: Cold Lake Air Weapons Range (CLAWR), 40 Miles NNW of 4 Wing Cold Lake.

DATE: 26 May 2003

The accident aircraft was the number three aircraft and part of the second four ship of an eight-plane Maple Flag mission launched from 4 Wing in Cold Lake AB. The four aircraft were in a "four ship card" formation. They had completed their simulated weapons delivery and were approaching their exit target, flying relatively level at about 480 knots and 3000 feet AGL. The number two aircraft had just closed to tight formation on the lead aircraft to inspect that aircraft for a possible gear problem. This put both of the leading pair of aircraft about 1.2 NM directly in front and slightly above the accident aircraft. When the accident aircraft reached the approximate point in space where the lead pair of aircraft had rejoined, it began a very fast negative G "barrel" roll to the right, completing a full roll in about 3.5 seconds. Although the aircraft roll rate slowed at wings level, the negative G continued and shortly thereafter the roll to the right commenced again. At about this time, with the aircraft in a negative G regime, the pilot initiated an ejection but he was fatally injured. The aircraft continued to roll under negative G, nosed down and impacted the ground inverted at about 45 degrees of pitch with a high bank angle and high velocity. It was destroyed on impact.

Initial analysis showed the pilot initiated ejection at about 90° of bank during the second roll with high roll rate and significant negative G, but within the "envelope of the system". A detailed forensic analysis of the escape system and Aircrew Life Support Equipment (ALSE) revealed that the combination of escape system equipment characteristics and the flight regime of the aircraft all contributed in the generation of a fatal force during the parachute-opening phase of the ejection sequence.

A Risk Assessment (RA) team, independent of the FS investigation, was convened by the Airworthiness Authorities to examine the CF188 escape system. Advisors from the Original Equipment Manufacturer (OEM) were part of this effort. Multiple deficiencies were uncovered in this detailed analysis, many of which were quickly corrected through Aircraft Operation Instruction (AOI) amendments, ALSE changes and equipment Special Inspections (SI). However, the RA and FS analysis concluded that changes to the ejection system, part of the already initiated CF188 Escape System Modernization (ESM), were the only means to significantly reduce the probability that the same fatal forces would not be generated in a similar circumstance. The most significant change in the ESM is to replace the present Simplified Combined Harness (SCH — Generation 1) with a torso restraint system. Expeditious pursuit of ESM is underway.

Detailed flight path data recovered from the Air Combat Manoeuvre Instrumented (ACMI) pod, carried on the aircraft, was analysed using simulators in Boeing's St Louis facility. This indicated that an aircraft with a single failure of the left horizontal stabilator (significant downward deflection) could induce the incident profile. The mechanism for such a failure is not yet determined but possible reasons will be explored as the investigation into this accident continues. Of note, there is no crashworthy flight or voice recorders (FDR/CVR) fitted to this aircraft and the data on the non crash survivable maintenance recording device fitted to CF188s was destroyed in the post crash fire. ◆

FROM THE INVESTIGATOR

Aircraft Occurrence Summary

TYPE: Schweizer 2-33A Glider C-GDZF

LOCATION: Picton, ON

DATE: 24 July 2003

The instructor pilot and the student were conducting a pre-solo training flight in the Central Region Air Cadet Gliding Scholarship Program when the glider struck the ground during the landing phase. Although the instructor received minor back injuries, the student was uninjured. The glider sustained "B" category damage.

The student completed the launch and upper air sequences prior to joining the circuit on the downwind leg. The student recognized that the latter stages of downwind were higher than normal and accordingly commenced a sliding turn to base leg. Once established on base leg, the student commenced a forward slip with spoilers fully extended in order to lose altitude. This configuration and flight profile were continued until after the glider was established on final approach.

Although still high on final approach, the student terminated the forward slip at 250' AGL as per Air Cadet SOPs. The instructor, however, recognizing that the glider remained high, took control and continued with a right wing-low forward slip.

The glider's right wingtip struck the ground first, followed by the glider's main skid. The impact caused the glider to rotate 30° to the right as it bounced into the air. After the second impact, the glider continued to rotate to the right as it slid across the wet grass landing strip, finally coming to rest approximately 90° from the direction of landing. Both occupants egressed under their own power.

The investigation is focussing on the technique and decision-making processes involved with the landing phase of flight. ◆

FROM THE INVESTIGATOR

Aircraft Occurrence Summary

TYPE: Schweizer 2-33A Glider, C-GCSD

LOCATION: Debert, NS

DATE: 14 August 2003

The solo student was participating in the Atlantic Regional Gliding School program when the glider's left wing struck a tree during the turn to final. The glider then crashed and came to rest upside down. The cadet received minor injuries. The glider received "A" category damage.

The student was three-quarters of the way through her course and had two circuit checks with an instructor and two solo flights just prior to her final flight. During these four flights, lift was encountered during the downwind portion of the circuit and resulted in the student landing long.

Once airborne, the student encountered turbulent conditions while on tow; she conducted several stalls in the practice area before joining the circuit. The student then entered left downwind lower than the recommended height to compensate for the earlier encountered lift. However, conditions had changed in the short time since her last flight and her final take-off 11 minutes earlier: the winds shifted to a right crosswind that bordered on allowable limits and the previously-encountered lift was no longer present.

The ground staff noticed the changing conditions and provided direction to the solo student as she drifted wide on downwind. Further direction was given to the student as it became evident that she was becoming critically low while on base leg.

The student had to pass by a large tree on the airfield perimeter before she was able to align the glider for a landing. It was during the attempt to pass this obstacle that the glider's wing struck the tree. The glider then spun to the left and, in a very nose-low attitude, struck the ground nose-first. The glider rotated about its vertical axis and then came to rest on its back. The student released herself from her harness and fell to the top of the cockpit where she remained trapped until ground personnel could open the canopy.

Damage to the glider was severe. The outboard portion of the left wing was almost torn from the rest of the wing while the right wing suffered severe ground impact damage. The aircrafts' nose was pushed in and shattered while the vertical stabilizer was severely crushed.

The investigation is focusing on the student training history, airfield obstacles, and wind conditions. ◆