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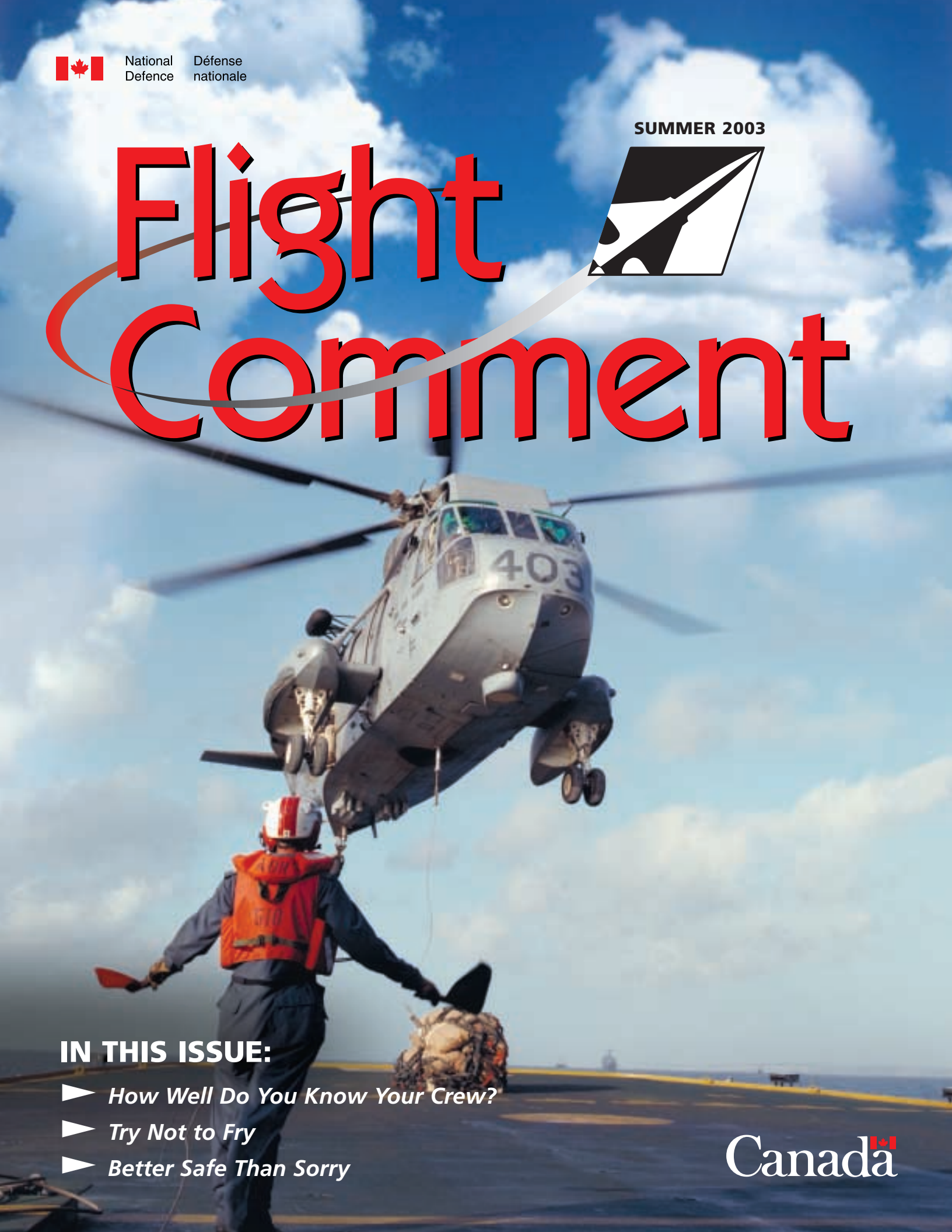
Flight Comment



IN THIS ISSUE:

- *How Well Do You Know Your Crew?*
- *Try Not to Fry*
- *Better Safe Than Sorry*

Canada

TABLE OF CONTENTS

1 .....For the Birds?

2.....How Well Do You Know Your Crew?

4.....A Long Day of Flying

6.....Try Not to Fry

8.....Eject! Eject! Eject!

10.....Air Force Flight Safety Training

11 .....What Would You Do?…ever been there?

12.....Maintainer's Corner
A Lesson NOT Learned:
A Disaster Waiting to Happen

14.....Perishable Skill — Currency is Not Proficiency

16.....A Simple Slap on the Tank Wasn't Sufficient!

17 .....When You Read…Do You See?

18.....Did You Check All Those Cotter Pins?

20.....Better Safe Than Sorry

22.....Discovering Electricity!!

24 .....Did I Grow Wiser from the Experience?

26 .....Won't need 'em — take two secs …

27.....A "Wake-Up" Call

28.....Épilogue

32.....Good Show

33.....For Professionalism

Flight Comment

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For the Birds?

It was another gray day in the spring on the west coast. — lower mainland, Langley airport, specifically. I flew L-19 tow aircraft for the Regional Cadet Air Operations — Lower Mainland Air Cadet Gliding Program, and we were about to embark on another day of familiarization flying. The gliders were untied and the daily inspections (DI's) were done. The gliders were pushed out to the field while I did the DI's on the Birddog, and taxied out for the launch.

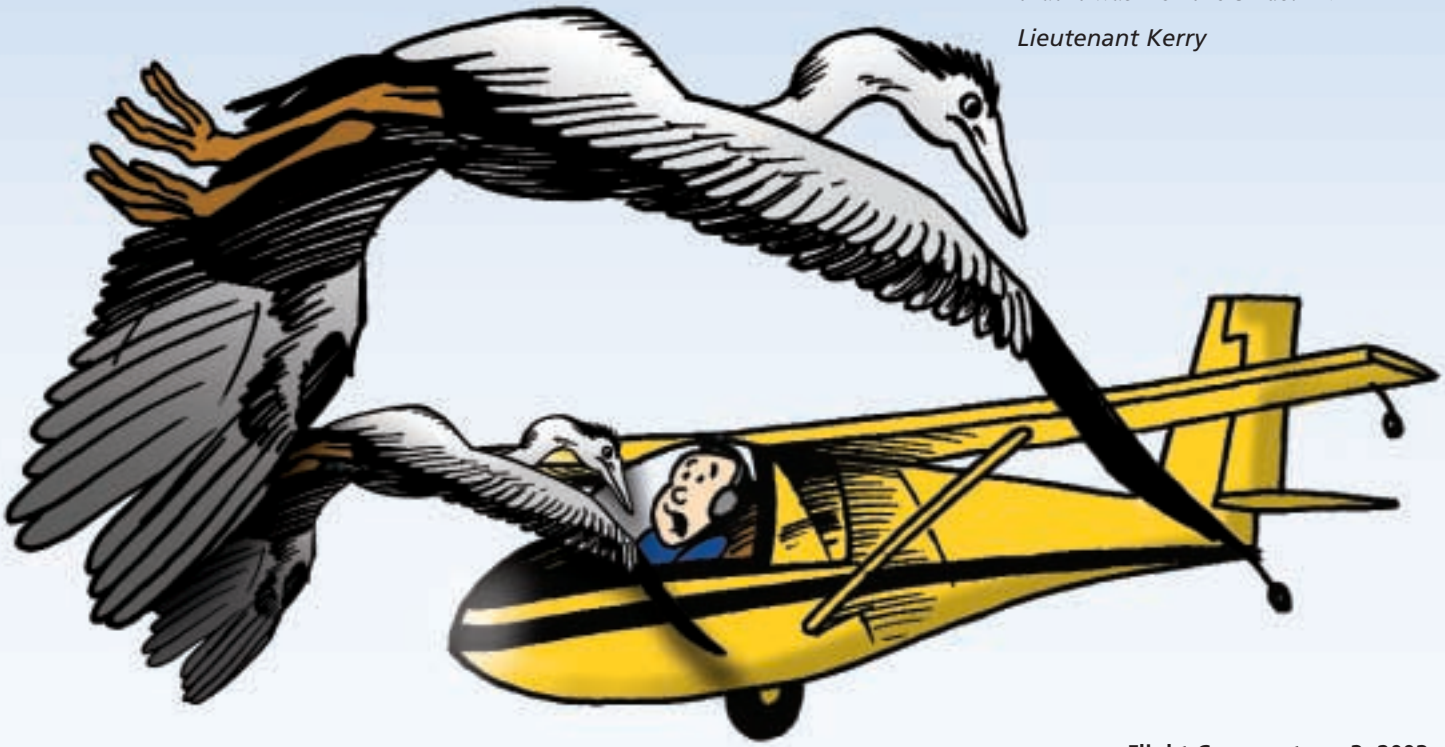
Away we went; the first series of launches went well and I began to settle into the routine of towing, releasing, descending, approaching, and landing at nine to ten-minute intervals. It was busy but there was always time to look out the window for other traffic and for birds. It's a good idea to note where the birds are; our little planes don't take too kindly to bird strikes.

About midway through the morning, I was at about 500 feet and beginning a climbing right turn with a glider in tow, when I noticed two herons slightly above and crossing in front of me about a quarter of a mile away. I continued the climbing turn and thought that they'd see our two airplanes and move away. After all, our airplanes were bigger than they were, and one of them was very noisy, too. I was also using all the lights on the airplane as per Standard Operating Procedures (SOP's). My navigation lights, pulse lights, strobe lights, and beacon were all on, and I remember thinking that the herons couldn't miss seeing us.

Call it complacency, or expectancy, but these two birds just kept filling up the windscreen. Now I was caught. There was no longer any time to maneuver. I couldn't make any aggressive moves with a glider in tow without seriously compromising the glider pilot and passenger's safety. Fortunately, the herons did see our little formation at the last second, and they did what birds normally do when they see trouble in the air — they dove for the ground. The rest of the flight was uneventful, and the day's operation carried on.

I didn't even report the incident; nothing happened, so there was nothing to report, right? Hindsight being what it is, I now know that I should have said something to the flight commander, or whoever was the flight safety officer that day. Someone could learn from my experience…or would they just say that it was "for the birds?" ◆

Lieutenant Kerry



How Well Do You KNOW YOUR

The highlight of my career was the time I spent as a Tactical Helicopter (Tac Hel) Flight Commander. The flying was excellent and the people I worked with were very professional, although some required prodding now and then. However, I soon discovered that it is not necessarily the people that you think require attention that will eventually surprise you.

When I introduced myself to my new flight, I laid out the ground rules for performance. I had high expectations and was particularly attentive for the need to abide by regulations and flight discipline. Some, I'm sure, felt I was rather pedantic, as I had little tolerance for pilots that did not strive to fly to the best of their abilities or were ignorant of orders governing air operations. If I noted deficiencies, I personally took an interest in the individual, ensuring that the most qualified member of the flight provided proper remedial training. In order to periodically verify the standard within the flight, I preferred to fly with all members, however, a shortage of experienced pilots often forced me to concentrate on the weaker first officers, depending on the more competent aircrew to cultivate their own abilities without my immediate supervision. Occasionally, one would have difficulty with an Instrument Rating Test (IRT) or a check-ride, but these problems were usually quickly rectified and the embarrassment was sufficient to provide the impetus to seek a higher personal standard.

After some time, I developed considerable confidence in my subordinates. I had seen many mature while they progressed from second pilot to aircraft captain. I had come to know many of them quite well over time, having served together on various deployments under very arduous conditions; and I thought they knew me. This particularly applied to one person that had arrived in my flight at the same time I did. Over two years, he had become an excellent pilot and a responsible, professional officer. Indeed, he was one of the many members of my unit that I depended on to carry out his tasks with minimal supervision and guaranteed good results. Indeed, he did not disappoint me for the entire month we had been deployed to CFB Gagetown to support both 438 and 430 Squadrons on a field exercise. I was proud of how we had performed during the exercise.

CREW?

It had been a very long four weeks and we were all tired of living in the field. Everyone continued to perform well, but it was evident that it was time to leave and all were anxious.

Assuming that there was no way anyone would ever dream of breaking the rule prohibiting an overflight of the camp, I directed departure preparations with the normal briefings and flight planning, concentrating on salient details. We were to leave in sections in order to avoid congesting some of the smaller airports where we would have to stop for fuel. As the first section departed and the second began to start their aircraft, it seemed to be turning out to be a beautiful day for flying. The wind was calm and the sun was shining. It was almost tranquil until I heard the thundering blades of a Twin Huey. Without even seeing it, I could tell unmistakably from the sound that the aircraft was approaching fast and low. I turned just in time to see it fly over the camp and turn sharply on the departure path. I knew who it was. How could he do this potentially dangerous and very unsafe act, knowing how I felt about flying by the rules?

At first you could have knocked my eyes off with a stick, however, my shock soon turned to anger. Yet, my anger was easily subordinated by the rage of the 430 Squadron Commanding Officer (CO). He was absolutely livid and was certain that this undisciplined act was a direct result of my supervisory skills, or lack thereof. I soon departed, still affected by the incident. I was disappointed in the pilot's behaviour and the CO's opinion of me. When I caught up to the individual at the next stop, the individual was somewhat surprised at my irritation. He assumed it was okay to do the flypast since the exercise was now over, not thinking that it was a serious breach of flight discipline. Needless to say, my discipline was swift and effective.

The individual in question never did get a last flight before taking his release as part of the Canadian Forces reduction plan (FRP). It had been his farewell flight, albeit somewhat premature. It just goes to show that some things may be worth repeating, even if you don't think them necessary. Maybe your people don't know you as well as you think they do and it is likely you don't know them any better. They just might surprise you! ◆

Major Vogan

A LONG

On November 1987, while based out of 413 Rescue Squadron in Summerside, Prince Edward Island, our Buffalo crew was tasked to respond to an air medical evacuation (med-evac) to Bathurst, New Brunswick. We were to transfer a pregnant woman who was having extreme difficulty giving birth. The weather at the time was rainy and cool and it was dusk. The transfer was to Halifax, Nova Scotia and we had an air med-evac team on board. It was our third tasking of the day, and we had already flown approximately seven hours. Although we were tired from the day of taskings, we felt because of the short transit time to Bathurst, Halifax, and then back home (approximately two hours), that the task would be quick and the woman saved. As a crew, we had decided to accept the task because of the nature of the emergency and also because it would take too long to call in the back-up crew.

After landing in Summerside, we refueled and, with the air med-evac team on board, we proceeded to Bathurst to complete our mission. It was raining at the airport when we started our approach to landing and the runway lights were on. The landing was smooth due to the wet runway and the taxi to the main terminal seemed as normal as any other time. Usually during an air med-evac, while taxiing to the terminal, I would be helping the team set up their equipment for the arrival of the patient. This particular day I felt tired and, as there were lots of people to help with the set-up, I decided to sit on the right-hand-side spotter seat.

As we were taxiing and only about 100 feet from the turn off to the terminal, I noticed the right-hand, landing-gear wheels were right on the edge of the taxiway. When the aircraft just started its turn into the terminal, the pilot had turned

DAY of Flying

a little early and the right-hand wheels rolled off the taxiway and were lined up to hit the blue taxiway lights that indicate the turn-off to the terminal.

Immediately, on the intercom, I gave the command "stop, stop, stop" and the pilot jumped on the brakes, sending whoever was standing up to the floor of the aircraft. With "not happy voices" coming across the intercom, they soon calmed down after realizing that the aircraft came to stop only inches away from running over the light stand, which would have caused not only the delay of the med-evac, but also major damage to the landing gear.

The day was saved and the med-evac was carried out successfully. Enroute to Summerside, the crew discussed the importance of team-work and the importance of being alert after a long day of flying. I made it a point from that time on to always be aware, both in the air and on the ground, for any possible incidents that could happen. ◆

RESCUE
P.H. Fleming

Try Not to Fry

Those of you who have been in the Air Force for a while will know that, every so often, aviators experience a metamorphosis, which I call "The Changing of the Flight Suit." Since the halcyon days of the 50,000-strong air force (yes Martha, we really were that big once!) we have slipped the surly bonds of earth clad in flying togs that morphed from dull gray to dark blue to dark green, to tan, and to blue-gray. Finally, after spending time in such interesting neighborhoods as Rwanda, Iraq, Aviano, and the Balkans, many of us realized what the tactical helicopter folks had known all along; pretty blue suits with flashy gold accoutrements just don't cut it out there. Toned down flight suits, while less than totally cool at air shows and at the bar, are just the ticket on operations. Now, we're shedding our skins again, to emerge from the hangar, anew, clad in toned down sage green. This time, however, more than the colour has changed; our new suits are made of flame resistant (FR) Aramid. We've gained significant operational capability, but at quite a cost; the price of our flight suits has risen by 130 percent!

We received our first shipment of approximately 9700 summer flight suits (one-piece) last spring, with more on the way. This was followed by 2700 tactical helicopter two-piece flight suits and 12,000 interim flight jackets last summer. The FR winter flight suits (two-piece) were tested in Cold Lake before Christmas and we expect to receive 9000 sets in November 2003. Until we have sufficient quantities of the new garments to equip all aircrew, they are being issued under the control of 1 Canadian Air Division Headquarters. Thereafter, they will be available for general issue.

Many of us have never worn Aramid, so this may be an opportune time to replace the inevitable rumours and flight line legends with some facts about the capabilities and limitations of these cool (and costly) new duds. Aramid is the generic name for a type of FR fiber known to many of us by the DuPont trademark "Nomex.®" Aramid does not melt or drip and forms a tough char when exposed to flame or high temperatures. Being inherently flame resistant, its FR capabilities are not affected by laundering. The flight suits can be machine-washed using household detergents, but fabric softeners should be avoided. Fabric softeners contain paraffin, a flammable substance that adheres to the material. There's not much sense in wearing a FR suit coated with a flammable substance!

Now you know that our new suits won't burn. That's the good news, but there's a catch. Your tender little body, clad only in a FR flight suit, can still sustain substantial second and third degree burns in a flash fire. Why? In a word, insulation. Canadians understand insulation when it comes to houses, parkas, and other means of preventing heat transference. The same principles apply to protecting ourselves from the extremely high temperatures of a flash fire. While it may not burn, the flight suit will still transfer lots of heat through the material to the body. Insulation, in the form of a second layer, is thus essential to the minimization of burn injuries. This has been proven conclusively in burn trials conducted both by DND at the University of Alberta and by DuPont, using their fully instrumented mannequin (Thermo-Man®) to measure heat transferrance. In the illustrations below, kindly provided by DuPont, the mannequin was clad in the standard USAF 4.3 ounce Nomex flight suit (model 27/P) and subjected to a three-second flash fire. In the first test, the mannequin was clad only in the FR flight suit. In the second test, the mannequin was wearing a second layer, consisting of short-sleeve T-shirt and briefs. Note the burns on the lower arms and legs. In the third test, a second layer of long underwear was used.

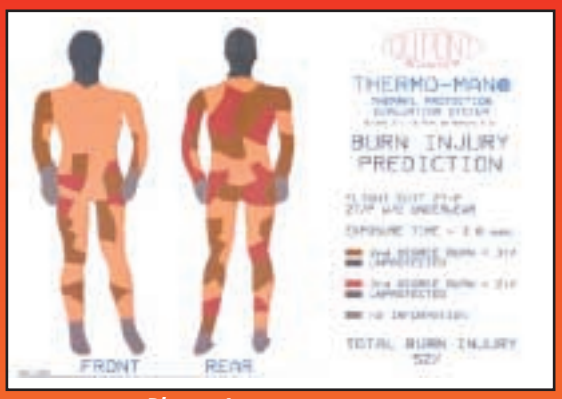
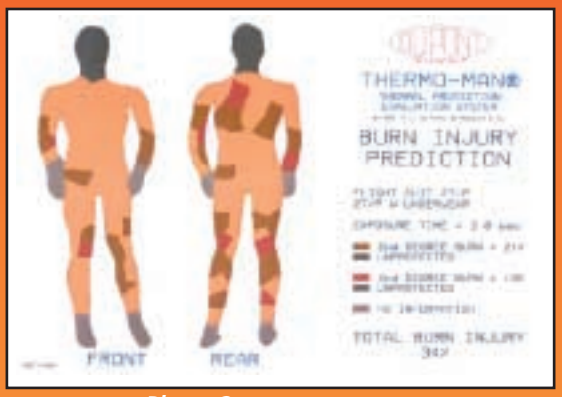


Photo 1



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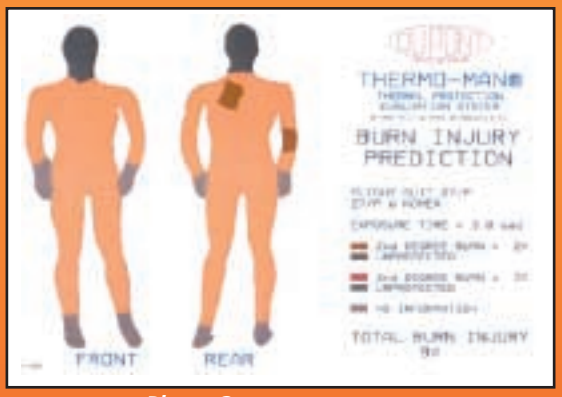


Photo 3

Because the mannequin is bare headed, test results always include burns to the head. The following table shows that a person clad in the new summer flight suit and lightweight long underwear will sustain burns on 18 percent of the body, **including the head**, and will have an estimated chance of survival of 97%. Depriving the legs and arms of second layer protection (photo 2 above) **will lower the chances of survival to 80%.** Of course, anything worn on the head (helmet, visor, oxygen mask) will add protection and increase the chances of survival, but the numbers are still significant.

NOMEX

THERMO-MAN® TEST RESULTS FOR CANADIAN AF PROTOTYPE SYSTEMS

SYSTEM Weights in oz/yd²	PRED. BURN INJURY 2ND D	 3RD D	 TOTAL	ESTIMATED % SURVIVAL
4.3 Nomex® + Lt. Wt. Long Und.	18%	11%	29%	94
5.5 Nomex®IIIA + Lt. Wt. Long Und.	9%	9%	18%	97
5.5 Nomex®IIIA + Hv. Wt. Long Und.	1%	7%	8%	99
Nomex® Rainwear + Lt. Wt. Long Und.	1%	7%	8%	99
Nomex®IIIA Fleece + Lt. Wt. Long Und.	1%	7%	8%	99
Nomex® Rainwear + Fleece + Sht. Und.	0%	7%	7%	99

* Thermo-Man® Single Test results, 1X HML, 2 cal/cm²s, 4 second Exposure
Source of Estimated Survival: American Burn Association 1991-1993 Study

PERFORM WHEN THE HEAT'S ON

Burn table

Depending on what we fly and what the temperature is, many of us may already be partially or fully covered by a second layer in the form of flights jacket, anti-G trousers, or survival vests, not to mention the standard issue cotton long underwear. But when it gets hot and dusty, we tend to shed layers; indeed, our flying orders direct local commanders to "promulgate an order on the wearing of dual clothing layers, with due consideration for heat stress." This way we can mitigate the risk of heat stress when it outweighs the risk of burn injury.

Aircrew are trained to use initiative and, those of us who use it wisely, tend to go far. Chances are then, that some of us make personal decisions to chuck the long johns sooner than authorized, when the mercury starts to rise. Hopefully, this article will sensitize all aircrew to the risks we take when we make these personal choices. Fly safe!

DuPont Thermo-Man® thermal protection system is based on ASTM Standard F 1930-99 which applies to flame resistant clothing. These conditions may not by typical of the conditions encountered in actual situations. The results of these tests are only predictions of body burn injury under these specific laboratory conditions. These results do not duplicate or represent garment or fabric performance under actual flash fire conditions. The user is solely responsible for any interpretations of the test data provided by DuPont, and included in this material, and for all conclusions and implications made concerning the relationship between mannequin test data and real life burn injury protection. SINCE CONDITIONS OF USE ARE OUTSIDE DUPONT'S CONTROL, DUPONT MAKES NO WARRANTIES OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR USE AND ASSUMES NO LIABILITY IN CONNECTION WITH ANY USE OF THIS INFORMATION. This data is not intended for use in advertising, promotion, publication or any other commercial use. ◆

Eject!

Eject!

Eject!

When a pilot utters these words and pulls the handle on the ejection seat, the escape systems better work properly. These systems are the last resort life-saving measure for aircrew and must be reliable. As the flight test authority for the Canadian Forces, Aerospace Engineering Test Establishment (AETE) was tasked to address deficiencies associated with the CT-114 Tutor and CT-133 Silver Star seat ejection systems. An escape systems specialist team was formed, headed by the project officer, Captain Charles Matthewson.

In June 1999, AETE was assigned to clear the 28-foot circular parachute on the CT-114 Tutor and the CT-133 Silver Star. The CT-114 passed all tests; the CT-133 did not. The team at AETE discovered a potential hazard — major seat/person separation problems. In some instances, on ejection, the combination of certain "all-up weights" (AUWs) and low centres of gravity (CofG), pitched the seat slightly forward, inhibiting seat/person separation. The last thing a pilot wants when ejecting from an aircraft is the added worry that the seat might collide with the parachute or worse, with him or her. What was needed was for the seat to "aft tumble,"

as the slight rotation spins the seat away from the pilot, like what happens when snow flies off the treads of a car tire.

The team tried to modify the variables of the test (AUW and CofG) but after two failures, they were faced with the fact that the plane ejection system on the CT-133 was unsafe, which led to the grounding of the fleet on 8 Oct 99. To find a solution, the team went to the Aerospace Equipment Research Organization (AERO) to test the AERO rigid arm drogue (ARAD) — a telescoping aluminium

arm with a drogue chute attached to it. During an ejection sequence, the ARAD extends and the drogue chute deploys, increasing the drag on the seat, which allows for seat/person separation. This equipment now had to go through various stages of qualification testing on the ground and in the air.

The CT-133 seat had a 0/60 (0 altitude and 60 knots of speed) ejection envelope. In order to test the ARAD from ground level to simulate the low-altitude, low-speed ejection, a test vehicle was needed. And what a vehicle it was — a jet black standard 1998 Dodge 3500 Series Chassis Cab Model truck powered by an 8L, 10 cylinder gas engine capable of speeds of up to 175 kph, aptly named "Black Thunder." It has a protective cage enclosing the cab in case of direct hit from the ejection seat after firing. The rear of the cage also serves as protection for the passengers in case of a rollover. All of the test equipment (generators, cameras, strobes, radio, fire extinguishers and other test components) including the ejection seat and the "dummy" were mounted on an 8-by-10 foot flat deck located behind the cab.

An even bigger challenge was to create a test bed for in-flight ejection seat testing. The team modified a CT-133 aircraft. They removed the rear seat and all rear cockpit controls from the 2-seater, low-wing monoplane and installed a test ejection seat. Among many of the changes made to the aircraft, a stainless steel blast shield was put in to protect the rear cockpit from heat and reduce the chances of gases and smoke wafting to the forward cockpit. They also removed the rear cockpit plexiglas so there would be an unobstructed path for the ejection seat to clear the aircraft. Extensive testing on the ARAD began in Dec 99 and was done in a phased approach.

- Technology demonstration and risk reduction testing:

  A prototype ARAD was installed on the ejection seat and was fired one time from "Black Thunder" and four times from the air in the modified CT-133.

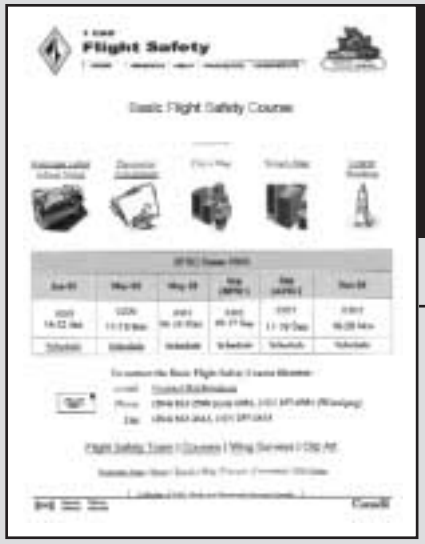
- Basic certification:

  During this next phase, the team needed to have a minimum of eight consecutive successful tests. This included two ground-based ejections from "Black Thunder" for the low-speed testing and six airborne shots at various AUW and CofG offsets. Both the 24-ft and 28-ft flat circular parachutes were used at this test stage. An additional two test points were conducted to address CofG concerns as directed by Director of Airworthiness.

The CT-133 testing occurred without incident resulting in the approval of the ARAD installation on all T-Bird ejection seats by the Director of Technical Airworthiness. Aerospace and Telecommunications Engineering Support Squadron (ATESS) in Trenton made installation kits, under contract with AERO, with the ARAD installation on all the ejection seats performed at the Squadrons operating the aircraft. The grounding of the fleet was lifted on 26 Jul 2000.

AETE is currently involved in a program to test the installation of the ARAD on the CT114 Tutor and improve the seat/person separation to make the escape systems safer. This world-class facility, in testing the operation of the ejection seat and making significant improvements on safety and reliability standards, has improved the seat-person separation and greatly reduced the risk of serious injury following an ejection. ◆

Ray Carter
Project Escape Systems Specialist



AIR FORCE FLIGHT SAFETY TRAINING

www.airforce.dnd.ca/orgdocs/hq_fs_e.htm

Many members have heard of the flight safety (FS) course, which is conducted by the 1 CAD FS Team. The course is a seven-day, interactive session that is designed to develop essential skill sets to form and run a unit safety management program. This article will provide you a brief overview of the Basic Flight Safety Course (BFSC), which arguably is one of the most effective safety management courses available, be it military or civilian.

The flight safety system as we know it today, was created in the mid-60s by Group Commander "Dutch" Schultz. The BFSC was in response to the rapidly increasing aircraft accident rate of the time and was part of many initiatives that now form the core of our flight safety program. For many years the course was only for aircrew officers; however, as we have evolved the 'team concept,' today's course is 50% NCMs and 50% officers, which is ideal from our perspective.

The FS system has evolved quite a bit since its early days in the 60's; however there remains once constant, that being to provide specialist advice to enhance operational effectiveness. Over the past few years, the BFSC has made human factors in decision making the heart of the program. Human factors and their consequences form an essential part in understanding "why" a course of action was chosen in a particular situation; moreover it is one of the more dynamic and interesting portions of the syllabus. These tools provide the unit flight safety professional the ability to conduct effective flight safety incident investigations, make the assignment of meaningful cause factors thereby improving our ability to introduce more effective preventative measures.

The BFSC is offered five times a year with one advanced serial (AFSC) in September. BFSC candidates are selected by their Commanding Officers (CO's) to fill the FS NCM or FS Officer positions on their unit. The candidates must be operationally capable and have supervisory experience, for it is their skill sets that enhance the effectiveness of executing the CO's flight safety program. The course is seven days in length and is held at CFSSAT, 17 Wing Winnipeg. The schedule is 'packed' and provides the candidates a host of topics essential for a safety management program. This was best typified in a recent comment of the course critique "Okay I am not thirsty now, you can turn off the fire hose!" In addition to human factors training, risk management, incident investigation and reporting, cause factor assignment, promotion and education techniques, and program development are some of the topics taught; additionally, skill sets for effective utilization of the computer based FS Information System (FSIS) are developed. The main cadre of instructors are from the 1 CAD FS team, however, numerous subject matter experts are brought in from across the country to instruct on a variety of topics.

For those selected for Wing FS HQ staff flight safety positions, the AFSC is offered each September. If the candidate has not had the BFSC within the past three years, the entire course must be taken with the AFSC modules as the content and scope has changed significantly. The advanced course reinforces many of the topics on the BFSC as well as covering additional topics such as medical, media and accident investigation. There are also a series of case studies and emergency response analysis.

For those interested in taking the BFSC, contact your unit FS representative and indicate you are interested in joining the Flight Safety Team. If selected by your unit CO, names are forwarded to the WFSO who will in turn prioritize candidates. The flight safety role is a tremendous leadership opportunity and allows individuals to directly enhance mission accomplishment. ◆

Captain Green
1CAD FS TRG

WHAT WOULD YOU DO?

...ever been there?

It was supposed to be one of those really great trips we get only once every blue moon. I was a junior co-pilot on an air show trip from Shearwater, Nova Scotia to Langley Air Force Base in Virginia. The weather in Shearwater was lovely, but we were heading into a developing low on the eastern seaboard with, as usual, several associated fronts. We stopped in Hartford-Brainerd, Connecticut for fuel before continuing our flight over JFK, LaGuardia, Newark, and various other busy international airports.

Hartford was reporting ceilings less than 1000-feet with visibility three miles in heavy rain showers. We waited for the "1000/3" call from the tower before we pulled into the hover in our Sea King. About five minutes southwest of the airport, we encountered 400-500-foot ceilings in climbing terrain, poor visibility, and rain. The decision was made by our Aircraft Commander (AC) to climb into the cloud to ensure ground clearance. We considered turning around, flying out to the coast where we could descend, or simply flying the contours, but, not wanting to be late for the Air Show Party, we elected to press on.

When we entered cloud, I began preparations for contacting New York Approach Control to file an airborne IFR flight plan. To my protest, I was told by the AC not to file IFR, as we would simply rely on VFR flight-following from New York Radar to maintain aircraft separation. The AC's reasoning was that New York Approach certainly wouldn't appreciate a little old Canadian helicopter requesting an airborne IFR flight plan, right while they were busy vectoring no less than thirty airliners through the cloud. At about 3000-feet, while in cloud, radar contacted us and queried our current meteorological conditions. "We're VFR," responded the AC. Again, radar queried, "Talon XX, confirm you're VFR?" to which the reply came again, "that's affirmative, we're VFR." To my protests, we continued to fly VFR, in IMC conditions, over the busiest airspace on the eastern seaboard of North America, relying only on the premise that New York Radar would vector us around all the IFR traffic in the area!

Nearing 6300 feet, New York Radar called us with traffic information, "Talon XX, you've got a Mooney heading your way at 6300 feet, opposite direction, three miles. Confirm visual?" "Looking," came the reply. "Looking at what?" I thought, "All I can see is white!" At 6500 feet, 45 minutes after entering IMC conditions, we broke out of cloud, only to see, seconds later, a bright red, single-engine Mooney roar below the cockpit. The crew figured that we were less than 1/2 mile from the Mooney, with vertical clearance of less than 200 feet.

That trip has taught me many things, and thankfully, I've lived to tell the tale. Even as a new crewmember who is unfamiliar with local operating procedures, we all know the CFP-100, and there are no Squadron standard operating procedures (SOP's) which permit us to break its rules! If you feel your aircraft is in jeopardy, or you or your crewmembers' lives are being put in harms way without due cause, there are many options available to you. I tried several, but to my regret I didn't try all of them. You should:

- Speak up, voice your concerns!
- Turn the aircraft around, and fly back into a safe flight regime!
- Tell your AC ***why*** you're not comfortable with what is happening, and why you don't want to be a part of it!
- If all else fails, report the incident to a higher authority!
- Regardless of the outcome, write a Flight Safety — share your lessons learned so that all may benefit!

What would you do? ◆

Captain Leonard

MAINTAINER'S CORNER

A LESSON **NOT** LEARNED: A DISASTER WAITING TO HAPPEN

The work of maintainers has many inherent dangers. Tasks such as starting or parking aircraft, refuelling operations and towing can be dangerous if we do not follow basic safety procedures. Towing at night can be particularly deadly, if we are not careful.

What incited me to write this article was an incident that happened in February 2003. As the story goes, it was a dark night, and a van was proceeding along a taxiway. The van driver saw a tow vehicle approaching and moved to the right. Unfortunately, the tow vehicle appeared to be moving in the same direction. The driver of the van sensed something was wrong, swerved to the left to avoid the vehicle, passed the tow vehicle and saw that an aircraft was being towed. The driver of the van did not know until that moment that there was an aircraft behind the tow vehicle. The incident report did not say but I bet that the van driver's heart must have skipped a beat or two when he or she realized how close to the aircraft the van had came.

When I read this incident, my own heart skipped a few beats, and I was taken back 14 years: it was October 1989, and a friend died that night. That was a terrible accident, one we all wish will never repeat itself. However, the incident of last February (2003) was almost identical to the accident of '89, except nobody died. So, when I saw this latest incident I was shocked and I could not help wondering **HOW THE HECK COULD THIS HAPPEN?** Haven't we learned anything from that towing accident — a **fatal** accident? I know that preventive measures had been implemented following the mishap; I clearly remember that when we towed at night we had to have strobe lights attached to the wingtips and the tail hook of the aircraft. That way, vehicles coming from any directions could see that something was being towed behind the mule. So, what happened to those measures? To tell you the truth, I have no answers. They may have been only local operating procedures. Nevertheless, I looked in the CFTOs to find out what the proper towing procedures are, and what I found was pretty interesting.

The basic reference for towing of aircraft is in the C-05-005-P06/AM-001. A caution after paragraph 7.g in Part 2 says: "… the aircraft extremities shall be made visible from the front and rear." This can be accomplished by using "… floodlights from the towing and following vehicles, or may be indicated by flashlights of safety personnel."

The message in the caution is that the aircraft under tow has to be visible, no matter from which direction another vehicle may approach it.

On a well-lit ramp, this step may not be necessary because the aircraft will be visible. But when the aircraft has to be moved to poorly lit or dark parts of the airfield, precautions have to be taken to protect other drivers. Of course, this demands some kind of preparations before the tow job is started, such as the lighting conditions of the route to be taken and serviceability of the floodlights on the towing vehicle and of the flashlights carried by personnel.

As mentioned above, the aircraft has to be visible at night, and that responsibility falls on the tow crew chief. However, other drivers have their share of responsibilities when driving around an airfield.

- Always assume that an incoming mule is towing an aircraft.
- Slow down so you have time to get out of the way before the tow vehicle reaches you.
- Drive on the far right of the paved surface.

I just hope that by reading this article, people will be reminded of the danger of towing at night and will take the necessary precautions to avoid collisions. Look at the pictures of the accident of October 1989, the night a friend died. We were supposed to have learned from that. ◆

Sergeant Anne Gale
DFS 2-5-2-2

"Perishable" Skill — Currency is Not Proficiency

"Perishable Skills." We have all heard the phrase, "That's a perishable skill," but what does it really mean? I have heard it for almost twenty years and always thought of my golf swing as my most "perishable skill." But a recent accident investigated by the Safety Center brought the phrase back to mind in a much more appropriate way.

This UH-60L accident serves as a prime example of how perishable some skills really are. It involved a crew that no one ever expected to have an accident. The instructor pilot had over 8000 hours of rotary-wing experience; the pilot was young but highly thought of, and all the crew members had flown together many times in the past. Both aviators were qualified and current for the night vision goggle (NVG) environmental training mission. The problem? Neither crewmember had significant recent experience in NVG flight. The hostile conditions overcame their skills. They became disoriented during a takeoff and crashed, destroying the aircraft. Fortunately, everyone on board will fully recover from their injuries.

We are all aware of "NVG currency" requirements as stated in the Aircrew Training Manual (ATM) for each aircraft. Instructor pilots and unit commanders constantly monitor aviators to ensure that everyone remains current by flying at least one hour every forty-five days under goggles. As long as we maintain that standard, we can report combat-ready goggle crews to the chain of command every month. However, in the back of our minds, we all know that one flight every forty-five days does not maintain the proficiency necessary to execute the tough missions we may be called upon to complete. This mission is a perfect example.

The aviators involved in this accident were NVG current. They met the ATM standards required to conduct the mission. However, neither crewmember had flown more than three hours of NVG flight in a single month for over seven months. We have all seen this in our units at one time or another. Other mission requirements, administrative obstacles, or flight time restrictions have put nearly everyone in this position at some time. Most often, we manage to get the mission accomplished when called on. The problems arise when an aviator who is just maintaining currency is placed in conditions with which he is unfamiliar and that require real proficiency rather than currency.

In this case, we put these aviators in a dusty, windy environment, with low illumination, with little recent experience under NVGs, and all these things added up to

Is your NVG proficiency more functional than this outdated helmet??

a situation primed for an accident. The cumulative effect of the risks associated with this mission exceeded the capability of the crew, and a major accident was the result.

If any one of the conditions — low recent experience, dust, winds, or low illumination — had not been present, perhaps the accident would not have occurred. If the aircrew had more recent experience, they would have been better able to deal with the harsh environment. If the illumination had been better, their low recent experience might not have been a factor. If the conditions had not been as dusty, perhaps the crew would not have become disoriented. If, if, if...

The key lesson to be learned is that there **are** perishable skills. Night vision goggle flight is one of the most perishable skills in our business. When circumstances force us to maintain NVG currency rather than proficiency, we must be aware that those aviators are not ready to proceed directly into harsh environments. Commanders must transition through the crawl, walk, run scenario. NVG currency is the crawl. NVGs in adverse conditions, such as the desert or other severe environments, are Olympic events. We can't expect aircrews to go straight from one to the other. ◆

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DFS Note:

We include this recent article from the US Army not because of the NVG proficiency lesson, but because that lesson applies to almost any kind of proficiency. I've been using the words: "currency is not equal to proficiency" (because I heard them from you, the people of our Air Force whom I admire so much) in the annual DFS briefings for some time now, but understanding the concept doesn't make it eliminate the problem. What can you do to ensure insufficient proficiency does not turn into an accident in your part of the Air Force? You can identify those tasks or sequences for which, in your professional and valuable opinion, proficiency is not what it should be to conduct them safely. You can think and brainstorm ways you could improve that proficiency or reduce the risks associated with the tasks, and you could ensure your leaders know about your concern and collaborate with them in reducing the risk. To get you thinking, read the article…

***Colonel Harder
Director of Flight Safety***

A Simple Slap on the Tank
Wasn't Sufficient!

I was an air weapons system (AWS) technician, fresh from my training in Borden, and I had been at Cold Lake for just two weeks. Naturally, I was very excited about starting my new career in the Air Force and I was especially excited about working on fighter aircraft. At 419 Squadron, passionately known as the "Moose" Squadron, I was working on the night shift, carrying out reconfiguration changes. Reconfigurations were very common on the CF-5 as the student pilots transitioned through various phases of their training.

Most of the work had been completed, but we had one more job to do. It involved the removal of a centreline fuel tank, followed by the installation of a rocket launcher. The job was to be completed by two very experienced corporals and me. I was directed to take up my position, as I had on other occasions, at the tail of the fuel tank with my butt on the floor and my knees propped up underneath the stabilizer fin. One of the corporals took up position at the front and the other prepared to remove the safety pin and unlock the rack, allowing us to lower the tank. When the rack was unlocked, the front of the tank crashed to the hangar floor and I was left supporting the weight of a ***full*** centre-line fuel tank. I was quickly helped from under the fuel tank and, luckily, everybody escaped without injury.

The procedure required us to physically open the fuel tank and use a flashlight to confirm the tank was empty, prior to removing it. Obviously, this very important step was omitted. Instead of using the proper method, we used a simple slap on the tank to determine its contents. This incorrect practice was used to save a little time. Hindsight being what it is, the mistakes are easy to identify. We let a hectic pace and poor judgement allow us to omit a very important step in the process. Unfortunately, this created a very dangerous situation. The fuel tank sustained damage at the front end, but we were fortunate to escape without injury to personnel. ◆

Sergeant Coombs

When You Read Do You See?

Prior to autumn 1999, I was employed as an Avionics Technician on a First Line Repair Crew at 8AMS Trenton. I have always taken pride in the attention I paid every job I was given, but the following incident causes me to question how observant I have been.

During AUP update, an aircraft technician employed by the contractor created two entries into the CF336 Aircraft Minor Defect Record on aircraft #334. The first entry stated that wires to a cannon plug had broken strands and required resoldering. The second entry stated that the pilots forward circuit breaker panel had damaged wires. The type of damage was not stated. The repairs were deferred and this unit carried out the aircraft acceptance check. The aircraft flew close to 180 hours without rectification. A supplementary check was carried out and again these snags were not rectified. A further 421 flying hours were accumulated until a technician examining the log set before Periodic Inspection noticed the defect.

Inspection of the cannon plug found six wires with broken strands. One wire was so badly damaged that attempts to read the labeling on the wire caused it to break completely. A second wire also broke during the inspection. Wires affected were part of the NLG Position Indication System, Ground Collision Avoidance System, IFF Transponder, and Emergency Brake Pressure circuits. Wires behind the CB panel had damaged insulation and exposed conductors, however, no strands were broken. The potential for dire consequences had existed for over 600 flying hours.

During my Integral Systems TQ3, I was taught that broken strands are not permissible on wire gauges #12 to #22 installed on CF aircraft. The Aircraft Wiring Procedures in C-17-010-002/ME-001 further articulates this. Furthermore, the importance of examining the log set before doing a job was stressed repeatedly during all aspects of my trades training. With that in mind, it is inconceivable to me that an aircraft could accumulate that many flying hours without anyone questioning these entries. How could anyone, myself included, continue to read these entries before and after ***every*** flight, and not "see" them?

I feel that the answer to that question lies in one word — Discipline. Checking the log set had become so routine for me (and I am guessing everyone else as well) that I failed to thoroughly pay attention to what I was reading. These entries were not worded ambiguously. In fact, they were very explicit. The statement of broken strands should have clued me in, and would have, if my checks were more than cursory. Personal discipline should be applied to all aspects of the job, not just the hands-on. This incident drove home this point to me. I can guarantee my checks of the log set will be more than perfunctory from now on. ◆

Did You Check All

It was a Monday morning in late June, the day after a three-day air show weekend, and all of the visiting aircraft were preparing to depart. There was one lone Boeing 707 in the circuit doing some training…as if things weren't busy enough! Looking up at the great white sacred cow, it seemed that something just wasn't right. As it flew past the tower, I saw that only the nose-wheel gear and the left main-gear were down. Shortly after reporting the news back to the section, a two-bell emergency sounded and things just got busier.

The Boeing went to dump fuel and to try to shake loose the hung-up gear in the air. Departure times were rapidly moved up in an attempt to get all the visiting aircraft airborne before the Boeing would possibly tie up the runway for hours. After all the departures, the pilot made several failed attempts to shake the gear loose using the runway, and finally brought the Boeing in on the smoothest landing I had ever seen. First, the left main-gear touched the concrete, followed by the nose-wheel and then the #3 and #4 nacelle. The pilot brought the Boeing right down the middle of the runway to a halt.

I was part of the crew that assisted in the investigation and recovery of the Boeing off the runway. Since there was a heavy training schedule for the next day, removal of the plane became a priority. It was hot and humid and the work was grueling, and every attempt to raise the right wing initially failed. The huge cable on the crane snapped; we ate chalk as the airbags burst like balloons; we stumbled chasing their

Those Cotter Pins?

compressors as they vibrated across the runway. Finally, with perseverance and a combination of the remaining airbags, the crane, and a couple of strategically placed jacks (which required field-level modifications as pieces fell off) we managed to raise the wing high enough to lower the gear. The following list is the ingredients required to lower one hung-up Boeing main gear:

- one temporary, well-placed jack;
- cargo straps (various lengths);
- one 6 x 6 piece of lumber, wedged under main wheel;
- one nice big sledgehammer (for above-mentioned 6 x 6);
- a couple of chains; and,
- the assistance of one firefighter with the Jaws of Life.

How, you ask? I'll leave that to your imagination and, all I'll say is, it seemed like a good idea at the time!?! It worked and the gear was down and locked quickly. There were probably a series of events that led up to what happened, but what stuck in my mind the most was that it was a small cotter pin, or lack thereof, on a 3/16 bolt on the up-lock link that caused the up-lock to fail that day, hanging up the right-hand main gear. The bolt and the castellated nut were found without a mark on one of the gear doors, while gaining access to lower the gear. It's surprising how that *small* cotter pin could bear such *huge* consequences. Since that day, I always ask myself (and everyone I work with!) **"did you check all those cotter pins?"** ◆

Master Corporal Rosche

Better Safe Than Sorry

About ten years ago, I was working as a new air weapons controller (AWC) on my first tour in the North Bay underground complex. We were known as "Sidecar control." It was a midnight shift and most of the CF-18 flying operations had ended for the day. It looked like another night destined for simulator training when, from the radio console, we heard "Sidecar, Sidecar, this is XPLR; request a mode-4 check." It only took a simple switch action to perform the electronic identification test that revealed that the transponder system on the outbound Aurora was functioning properly. I replied "XPLR, mode-4 sweet; have a good flight." Their flight plan indicated that they would be conducting an over-water sovereignty patrol for the next seven hours. Tracking them by radar would be futile as they fly low-level with their transponders turned off during tactical operations.

The Air Defence community recently had a renewed interest in the capabilities of the Aurora as this aircraft was ideally suited to track and monitor drug smuggling aircraft. Such aircraft are typically classified as small, slow-moving, single or twin-engine models that try to penetrate North American Air Defence (NORAD) airspace. The drug smuggler's flight profiles make them a difficult target for high performance fighter aircraft to track without being detected, whereas the slower speed, high manoeuvrability, and extended endurance of the Aurora make it a platform of choice for such air operations. Although not officially tasked in this capacity, the Aurora can lend assistance if called upon.

That night, nothing out of the ordinary transpired. When early morning came, the eastbound transatlantic airline traffic was beginning to trickle into Canadian airspace. Not long after, a westbound track without any apparent transponder code appeared just outside the Air Defence Identification Zone (ADIZ), east of Nova Scotia. Once an unidentified track enters the ADIZ, the air defence control facility (ADCF) has two minutes to identify the intruder, otherwise fighter interceptors would be launched to do the job. Luckily, a positive mode-4 interrogation reply confirmed that it was an inbound, friendly, military aircraft. In fact, this was XPLR returning from its sovereignty patrol at 15,000 feet. Being starved for some live action, instead of some simulated traffic, I radioed the crew to ask if they would be

interested in performing a few intercepts on targets of opportunity. Being motivated in their new role, they accepted.

In Canada, "scramble, intercept, and recovery" (SIR) control regulations are quite liberal and apply to practically all types of airspace, provided that a minimum of ten miles horizontal or 5,000 feet vertical separation is maintained between the designated flight and the other aircraft. Additionally, a continuous mode-C read-out, which confirms altitude, is required. Looking for a suitable target, I took control of the Aurora and turned it towards a civilian commuter aircraft tracking northeast at 16,000 feet, according to his mode-C. The directed mission was a "stern intercept" where the Aurora would offset its course and turn at the precise time into the target's rear quarter to adopt a shadow/monitor position. To my surprise, XPLR took an inordinate amount of time to descend to the directed altitude of 11,000 feet. Being determined to keep things safe, I quickly repeated the instructions and asked the pilot to expedite the descent. Both aircraft were now converging towards each other with less than 5,000 feet of vertical separation and only fifteen miles of lateral separation between them. Not taking any chances on breaking our SIR agreement, I gave the Aurora a hard turn (snap) to the southwest in a last ditch attempt to maintain separation. The two aircraft came within eleven miles of each other with 5,000 feet of vertical separation and no violation of airspace occurred. I was technically safe on both accounts but my heart was racing like I was running the 100-metre race. Needless to say, the final roll-out to complete the intercept was less than textbook geometry. After this run was complete, the Aurora aircrew humbly requested to return to their base, citing that they had had a long night. I cordially complied and thanked them for the training opportunity they had given me, hoping that I hadn't muddied the waters for the future.

Since then, I have figured out how to make the experience more rewarding for both the controller and the aircrew. I no longer expect fighter performance from a non-fighter aircraft and crew. I also allow for more lead and set-up time prior to an intercept, particularly under last minute circumstances. After all, it is better to be safe and to *not* break the SIR agreement than to be sorry. ◆

Captain Riffou

Discovering Electricity

The Aurora had been sitting on the ramp, awaiting departure for over an hour. To continue the mission, Operations (Ops) would have to issue new orders to the aircraft. Little did I know how this night shift would prove to shape itself into something memorable.

The first problem to overcome was to figure out how to get the paperwork into the aircraft without creating any undue delays. The weather was cold and windy so I deduced that approaching the aircraft from the 6 o'clock position would not be an issue as I was heavily dressed and, if anything, the exhaust would give a warming effect. The next issue would be how to get the envelope onboard without having to shut down the engines. Easy, I thought, just hang a plastic bag on a cord down the general-purpose chute. I would simply place the envelope in the bag and the crewmember would pull it back up into the aircraft. After all, we did it that way on the Argus for years. So, we passed our brilliant plan on to the aircrew and briefed how the evolution would be handled from start to finish. Everything was set, or so we thought!

The orders from Ops arrived as expected, so I left for the aircraft with my rigger buddy to get this airplane on its way. As briefed, I went to the port wingtip and signalled the pilot that I was ready to approach, as planned. I received the thumbs up signal, and off I went. What a genius I was!!! So, as I was passing under the stinger, I noted how comfy it was in the exhaust and how much I adored the smell of burning JP4 fuel, but I didn't notice the bag I was supposed to put the orders in. It must be there, I was thinking, so when I got a bit closer, I spotted it just on the edge of the

chute. OK, they don't want it flapping in the prop wash; that was a smart idea. Too bad I wasn't as smart!! I removed one mitten and reached for the bag. BAAAM!! Six inches from the chute, I got hit with a jolt at the left hand. OK! I was fine and I just wanted to get the job done. I stuffed the orders in the bag, making sure I stayed at least a foot away from the chute. As planned, I pulled the bag far enough away so I could safely pull the cord, signalling its retrieval. Unfortunately, the crewmember was waiting on the other end so, the millisecond it moved, they yanked it up. You guessed, it, BAAAM! Again!

In disgust, I headed back away from the Aurora and returned inside. What happened? In short, the Aurora likes to keep the grounding straps off the ground when the inboard engines are running, leaving the aircraft looking for somewhere to ground. The Argus didn't exhibit this trait. So…what did I learn on that cold and windy night? Well, the Aurora was a brand new plane back then and I elected to carry out a procedure, which I assumed would work. That was a Big Mistake! Since then, I never approach a strange aircraft unless certain that, whatever the task, I'm content that what I'm doing doesn't hold any surprises in store.

While some might say that Ben Franklin couldn't have been thinking too clearly when he flew his kite into that thunderstorm, he was by no means the only one to discover electricity in the most unexpected of places. ◆

J. Samson

Did I Grow Wiser

They say that when you look back, you remember only the good times. This is a story about a time that I clearly recall being really miserable. During the mid 80's, whilst serving in the Royal Air Force (RAF), I was stationed at a godforsaken place on the tip of the west coast of Wales called RAF Brawdy. The place was pretty remote by UK standards. The nearest town was sixteen kilometers away and populated by relatively unfriendly people. As another measure of isolation, there were no single service women permitted to serve there and the nearest McDonald's was 176 km away and didn't even have a drive thru! The airfield was on top of a cliff, overlooking the Irish Sea. If you stood at the end of the runway and projected a line, the next landmass that you hit was in the Caribbean. Consequently the weather, and especially the wind, used to roll in with nothing to stop it. The place was renowned for horizontal rain pushed by extreme winds. Wind speeds of over one hundred kilometers per hour were not unusual and I have seen sea fog roll in at almost fifty kilometers per hour. To work outside, even on a relatively normal day, required a jacket, bobble hat (toque), and gloves.

This particular day had started out badly; the temperature was -1°C with a mixture of rain and sleet that was coming in at a forty-five degree angle and gusting to seventy kilometers per hour. My day got slightly worse when a snap security alert (Northern Ireland, etc) had me getting soaking wet on my way to work when my vehicle was inspected for bombs, both under the bonnet (hood) and in the boot (trunk). When I arrived at work, it was still dark but the message was to get the aircraft airborne. A break in the weather was expected, which would allow at least one wave of planes to be launched. After towing, I was detailed by the line controller to top up the hydraulics on an aircraft out on the line. I gathered my tools — torch (flashlight), snips (side cutters), spanners (wrenches), locking wire pliers (wire locking pliers), risbridger gun (version of a PON) and other items I needed and went out to the aircraft. The weather by this time seemed to have gotten worse but, bundled up in the RAF version of foul weather clothing, I reasoned that the simple task I was about to undertake should not take more than twenty to thirty minutes.

Now, it must be said that the foul weather clothing issued at that time was not the best and the general issue of Gore-Tex was still twelve months away. The nylon stuff we had was optimistically termed as weatherproof, not waterproof, and was designed for the temperate climate of Northwest Europe. Unfortunately, the conditions at the time were bordering, in UK terms, on the Arctic. At a temperature of minus one with gusts of seventy kilometers per hour, the wind-chill factor was minus Omygoodnessits cold!! So, there I was, using my shoulder to clamp the torch tightly in the crook of my neck, trying to shelter from the rain and carry out the task at the same time. Needless to say, I got very cold; my hands and feet were numb and, on the basis that they couldn't really get any colder, I carried on.

About an hour later, I was relieved from the task and the work I had managed to complete was rechecked. I'm not even sure how far I had gotten with the task. When I went back inside and reported to the line controller, he immediately recognized that I was in the early to middle stages of hypothermia. After a change of clothing, a warm-up as close to a radiator as I could get, a good brew (cup of tea), and a quick check by the medics, I was told that I was going to be alright and to be more careful in the future. The wind-chill had got me, but what really caught me out was the fact that I had been wet in the first place. My clothes had already

from the Experience?

started out wet from the security check, the weatherproof clothing let the rain in like a floodgate, and my body heat was just taken away by the wind. I have never been that cold, either before or since, and it is definitely not an experience that I would care to repeat.

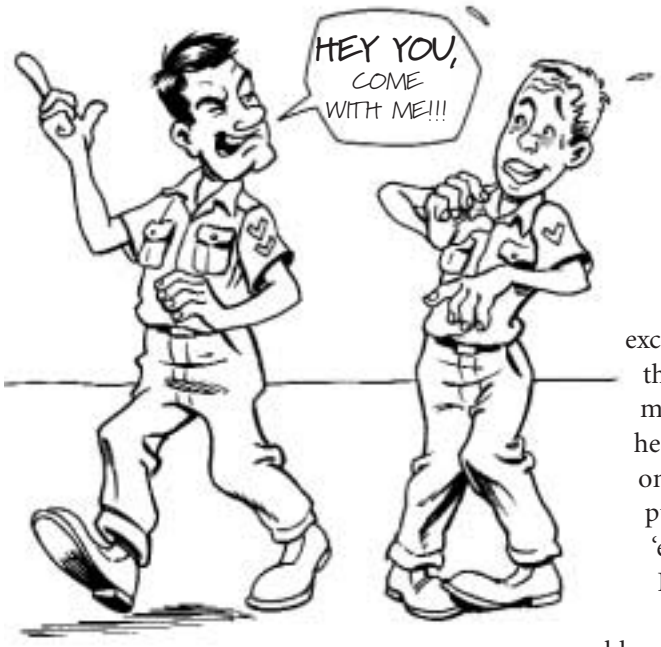
However, did I grow wiser from the experience? In the words of songwriter Shel Silverstien, "Yes, my dear, I grew wiser in many ways, but the thing I learned most was…" Well, I learned several things that day. I learned that it doesn't matter where you are in the world, you can be caught out by the weather. We've all been briefed about being "winter wise" or, for that matter, "sun wise", but how much notice do we actually take. The expected weather window never did materialize so, now, I never implicitly trust a weatherman. Another thing I learned was that I didn't have to do the job on my own. I could have asked for help. I knew what I was doing, or thought I did and, in the final analysis, how good a job did I do?

Nevertheless, the lesson I learned the most was taken from the attitude of the line controller and it is an approach that I have tried to live up to ever since. Even though his job was extremely busy that morning, (forty guys and a flying schedule to look after), he still took the time to look after his men. Somehow, in the hubbub, he had noticed that I hadn't returned at around the expected time, so he sent someone to find me because he suspected something was wrong. He knew my capabilities and me well enough for that "sixth sense" to kick in and give him the message that something was not quite right. What I have since realized, and what he already knew, was that the people we work with are our most important asset and, without them and without looking after them, it doesn't matter how simple or complex the task is, it won't get done.

As for being really miserable? The experience of getting really cold was bad enough but the really, really miserable part was when I was thawing out. Good grief, never again! ◆

Greg Hallsworth

Won't need 'em — take 2 secs …



Attending the recent annual DFS briefing inspired me to relate an event here that happened to me more than a decade ago, on my first operational posting. Why am I making noises now, and not ten years ago? It could be because, as an apprentice technician, not only did I not know what was going on around me, but also I failed to grasp even the scope of that unfamiliarity. Today — given a greater familiarity with the nature of Flight Safety — the time just seems right.

I was at the unit basically since coffee-break — the only thing wetter than the space behind my ears was the ink on my TQ3 (apprenticeship) qualifications, and everyone knew it, most of all me.

Assigned ("Hey you, come with me!") to a Corporal Airframe Tech to help with some gear retractions on a jacked Tutor, my place — as resident Instrument Electrical Tech — was in the cockpit, working the gear handle. Everything seemed right, except I thought it odd that we would not be making use of the nifty headsets that were sitting on the shelf for just this purpose. ("Won't need 'em — take two secs …") Headset communications seemed reasonable, what with one of two techs being buried inside a wheel well for the job, but I was as green as a wet clump of broccoli, and got about as much respect.

It was business as usual in the hangar that day — in other words, it was noisy. A few spots down, another crew was scrambling all over their jet, doing some sort of check. Just outside, another Tutor was being run through a start.

The Corporal got himself set up quickly, and disappeared into the port wheel well. He hadn't briefed me on very much, but the gist of the job was that he would make an adjustment deep in the wheel well, climb out, have me cycle the gear, and then make another adjustment. We devised a clever method for determining when he wanted me to cycle the gear — if he shouted "Up!" that was my cue.

If you don't know where this is heading by now, you weren't paying attention back in paragraph three. Sure enough the whole thing worked as advertised for several cycles. I figured we wouldn't have to do too many more …

I heard "Up," and reached for the handle, as I had done half a dozen times already. But this time something in the Corporal's tone sounded odd; so I craned my head around and down to take a look. He was still deep in the wheel well, making his adjustment. He hadn't shouted "Up!" or even shouted anything at all. What I had heard was the crew a few spots down shouting instructions to each other. The noise from the running jet about a hundred feet away had completely destroyed my ability to localize sounds.

I almost killed that guy! I told him this afterward — being shocked and stunned that only chance hesitation had kept me from crushing this tech — and he shrugged. The incident didn't mean a thing to him. Life goes on.

In hindsight we pretty much engaged in every violation we've got a rule against. That incident has stayed close to my scalp since then, fuelling a better-than-average interest in Flight Safety. Nowadays, for better or for worse, I refuse to be rushed, and insist on being informed. It's the least someone in my position can do. ◆

Cpl Marcel Gassner

A "Wake-Up" Call


FLIGHT SAFETY OCCURRENCE REPORT - INITIAL

My years as an airframe technician, a term now replaced by "aviation technician with a strong rigger background," saw me working on everything from Hornets to T-Birds to Hercules to Challengers. Somehow, as I moved from place to place, I managed to retain a reputation as a "good" technician. Normally, having your peers envision you as an accomplished technician is a badge of honour. However, as the years went by, and the aircraft fleets have become a blur of unidentifiable airplane parts, this moniker became difficult to maintain.

It seemed as if every time I was introduced to a different fleet, my rate of qualification and authorization became quicker. Knowing this, in the back of my mind, I elected not to say anything and, if my peers and supervisors thought that I was capable of performing the required tasks, then I must have been. Don't get me wrong; every time I received a new qualification I was asked "are you comfortable with doing this?" Normally, I was. Occasionally, however, my little voice tried to intervene but would be obscured by another, not so little voice, yelling "shut up…-he's done lots of stuff like this on other jets."

I accepted 99% of what was thrown my way and, as personnel shortages became more and more evident, what choice did I have? "More with less," after all! I continued to work and I'm sure that I made the odd technical mistake and the occasional error in judgement. Luckily, it was never anything potentially life-threatening or never anything that could possibly cause injury. It was certainly nothing that would warrant a flight safety incident report. Nonetheless, I was making mistakes that I wouldn't have previously. Was I getting lazy? Was it a case of too much work and too little time?

Finally, **IT** happened!! An aircraft had a flight safety occurrence report against it and my name was all over it. I distinctly remember the sickening feeling that swept over me as I realized what might have been. I lost a lot of sleep. I tried to recount the job in my head innumerable times and to this day, for the life of me, I cannot figure out what went wrong. Fortunately, the mistake was found before anything of consequence had happened.

This became my "wake-up" call. Shortly after the incident, I sat down and did some soul-searching and tried to identify how all of this came about and what I could have done to prevent it. This is my list.

- If you receive the label "good technician," don't let it go to your head. Wear it well by always being aware of just how easily and quickly it can turn to "terrible technician."
- When Hornet parts and Hercules parts start to look the same, step back and take some time to get perspective on what you are doing.
- If qualifications and authorizations (Q&A) are coming fast and furious, ensure that your competence level for each and every job is worthy of the Q&A.
- When asked "are you comfortable with doing this?," let pride take a back seat. It is a question that seems hard to answer in the negative, but if you are not comfortable, just say "NO!"
- When hearing "little voices in the back of your mind," just pay attention to them. You are not nuts for listening!
- If you find the frequency of little mistakes on the rise, step back and take stock. Be wary, as little ones can become big ones very quickly.

Whether you are in your first year, your last year or somewhere in between, technicians are charged with ensuring our fleets remain as incident free as possible. We all make mistakes but, if the little misjudgements and errors are written off to pride in ones work or just being a "good technician" eventually, IT will happen to you. ◆

Master Corporal Spencer

ÉPILOGUE

Aircraft Accident Summary

TYPE: Jet Ranger CH139314
LOCATION: Southport, MB
DATE: 27 June 2002

The instructor and student were conducting a Night 1 Lesson Plan. Following some initial circuit work in Area North they proceeded to 'Grabber Green' autorotation landing area. The instructor was demonstrating a '500 foot' straight ahead autorotation to touchdown. The aircraft struck the ground firmly during the termination of the flare. The crew received minor back strain injuries. The aircraft sustained "B" category damage.

This was the instructor's first night auto to touchdown during the mission. Wind conditions were ideal with a southerly flow of 10 knots. The ground elevation at Southport is 885 feet, but due to temperature and humidity, the density altitude (DA) was high (2300 feet). The flare entry progressed normally but the instructor elected to terminate the flare with a more aggressive collective check due to the high DA. Either the collective check was too aggressive for the conditions or the timing was too early because the aircraft ended up being high for the level-off and cushion stage (10 feet). From 10 feet it becomes more difficult to safely land the aircraft. The instructor recognized his error and attempted to overshoot by adding throttle. Throttle application was tentative as the instructor was concerned about causing a loss of tail rotor effectiveness. If the RRPM gets low (70% range) the tail rotor speed and effectiveness become proportionally lower as well. If throttle is applied too quickly you can reach high torque levels prior to the tail rotor reaching sufficient effectiveness to counter the main rotor torque. This can cause a loss of tail rotor effectiveness and result in an uncontrolled swing of the aircraft tail. If this were to happen as the aircraft was touching down it could cause the helicopter to roll over.

It is difficult to determine if a more positive application of throttle would have prevented the accident or simply aggravated the situation. Regardless, there was insufficient rotor RPM left at the cushion stage to safely land the aircraft.

The investigation revealed that instructor proficiency in night flying was not being re-evaluated following completion of the Flight Instructor Course. This meant that instructor ability to safely execute a night autorotation, conduct circuit training and basic aircraft handling at night was not re-visited unless a lapse in currency took place. This was not a factor in this accident as the instructor had recently regained currency in night autorotations during a standards check ride. DFS has recommended that night proficiency be included in the annual category check for instructors.

At the time of the accident, students were still being assessed for their ability to execute night autos despite the removal of night solo flights from the training syllabus. In order to reduce the risk exposure incurred during night autos, the school has removed the night auto as an assessed manoeuvre for students. Instructors continue to execute this manoeuvre for demonstration purposes. The school has added two night missions to the Flight Instructors Course in order to allow further proficiency training in night autorotations. ◆

ÉPILOGUE

Aircraft Accident Summary

TYPE: CH12422

LOCATION: 150 NM South of Honolulu, Hawaii, USA

DATE: 23 Jun 2000

Crewmember in life-raft, immediately after ditching.

Approximately 25 minutes after launching from HMSC PROCTEUR, a hot Main Transmission Gearbox (MGB) was noted. As the crew returned to land, cockpit indications were assessed as severe enough to require a controlled ditching. After the crew successfully egressed uninjured, the aircraft sank, suffering "A" category damage.

The investigation eliminated all possible MGB malfunctions as causal to this accident with the exception of an over-temperature condition similar to previous 21000 Series MGB overtemps. Only this inherent overtemp condition, that previously had neither been satisfactorily explained nor caused any known damage, offered a plausible explanation of the indications experienced by the crew.

The CF Sea King fleet has, since 1994, documented a phenomenon of inherent overtemp in all regimes of operation in which MGB temperature rapidly increases above the normal operating range up to and exceeding the maximum operating limit. Through informal trial, the "#1 SSL Procedure" was developed in which the #1 Speed Select Lever was retarded to the ground idle position. This action was known to work with not only CF Sea Kings, but also with USN Sea Kings despite the lack of the original equipment manufacturer's engineering data to support the theoretical cause of internal overtemp conditions. CF flight safety data showed that in all 27 overtemp occurrences when the #1 SSL procedure was employed, it was 100% effective in not only arresting further MGB temperature, but also in reducing that temperature regardless of maximum value reached. Furthermore, a significant number of these occurrences indicated that MGB pressure fluctuations were evident with the overtemp indications. Despite this data, the procedure remained a discretionary one in the Sea King AOI; it was not included for reference in the Pilot Checklist.

Analysis concluded that had the #1 SSL procedure been mandated for use in instances of MGB overtemp, it is highly probable that the high temperature condition and all its associated indications would have been reduced or eliminated, thus reducing the severity of indications from Land As Soon As Possible to Land As Soon As Practicable.

Given lack of guidance and resulting non-use of the #1 SSL procedure, the crew decided to enter the hover with only Land As Soon As Possible criteria in evidence. Once in the hover, significant pressure fluctuations, strong welding-like metallic odours and radiant heat from the MGB developed. These new indications led the crew to conclude that MGB failure was imminent. Had the aircraft continued (as suggested by the Land As Soon As Possible criteria in the AOI and checklist) instead of coming to the hover, the aircraft may have successfully returned to land on the nearest flight deck.

As a result of this accident, the AOI and Checklist were updated to accurately reflect the mandated use of the #1 SSL procedure in instances of inherent MGB overtemp. The requirement for this procedure has subsequently been overcome by events with the introduction of the new 24000 Series MGB. It was further recommended that emergency procedures be reviewed to give aircrew specific direction with respect to the notion of coming to the hover for MGB emergencies.

Other preventative measures included staff work to address both the experience levels and training offered to HELAIRDET senior NCMs. 12 Wing also initiated a training program to ensure that line maintenance personnel are aware of torquing procedures in accordance with the CFTO and that the techniques are uniformly applied.

Finally, due to some confusion over ditching and egress SOPs, it was recommended that the AOI and Pilot Checklist be amended to give aircrew a logically flowing sequence of reactions to water operations emergencies. It was also recommended that current aircraft egress training be reviewed to ensure that correct procedures are adequately emphasized and that the hazards posed by non-standard actions are understood by all aircrew. ◆

ÉPILOGUE

Aircraft Accident Summary

TYPE: **Jet Ranger CH139308**
LOCATION: **Southport, MB**
DATE: **2 July 2002**

The Standards Officer was conducting a proficiency check ride on one of the instructors from the Basic Helicopter School in Southport. The focus of the flight was to assess the instructor's proficiency in autorotations. The crew successfully completed a number of straight-ahead and 500-foot turning autorotations, but the aircraft struck the ground during the landing portion of a 250-foot turning auto. Both crew members received serious back injuries. The aircraft sustained "A" category damage.

The winds at the time of the accident were variable in strength and direction but within the limits indicated in School Orders. Crews operating in the area reported having to add throttle to cushion some landings and to adjust the entry point on downwind due to strong winds aloft. The crew of the accident aircraft experienced problems with airspeed control on some of their autorotations, overshooting on several (both pilots' first attempt at the 250-foot turning auto). These facts point to the likelihood of a decreasing performance wind shear as the aircraft descended from circuit altitude to the ground. Unfortunately there is no wind recording equipment at the autorotation training area.

The accident manoeuvre was the Instructor's second attempt at the 250-foot turning auto. The Instructor was sitting in the right seat and flying right hand circuits. The entry was normal, but during the turn to final the instructor used considerable bank and backpressure to expedite the turn. This bled off the airspeed to below the '60 knot' ideal. Although the requirements of the '100 foot' check were met, the aircraft was on the low end of parameter acceptance (low and slow). The Instructor commenced the flare at 50-60 feet AGL. As the nose of the aircraft was pulled up for the flare both pilots stated that the airspeed dropped off quickly and an excessive descent rate developed. The Instructor was somewhat startled by the aircraft reaction and did not immediately initiate the overshoot. The Standards Officer took control at 30-40 feet and applied throttle and then collective ("low level save"). This did not seem to have any effect and therefore he concentrated on getting the aircraft level prior to impact.

It is possible that the transition out of the turn (low and slow) and into forward autorotation may not have been "clean enough". This would have left less time to develop a steady forward

autorotative glide prior to flaring. With low airspeed, the descent rate would be higher than desired. At the commencement of the flare, the rate of descent notably increased coincident with a marked decrease in airspeed. It is perhaps at this point that the aircraft entered a zone of decreasing performance shear. It is possible that these two factors (glide and shear), in combination, created conditions where the flare would be unable to effectively reduce the rate of descent.

The investigation also examined the possibility that Vortex Ring State (VRS) may have been a contributory factor during the landing phase. For this accident, the steep descent and/or the sudden increase in rotor thrust during the power recovery attempt may have combined to create conditions for VRS to occur. However, the rotor must be generating significant lift for VRS to develop fully, and that would have occurred only after collective and throttle application. These occurred too close to the ground for VRS to develop sufficiently to have had material effect. It is unlikely that fully developed VRS was a factor in the accident however; it is possible that the application of power during the 'low level save' put the aircraft into the incipient stage of VRS, thereby reducing the effectiveness of the overshoot attempt.

As an interim measure, the entry altitude for the low level turning autorotation was raised from 250 feet above ground to 350 feet above ground to allow more time for the set-up of the sequence. DFS further recommended that:

a. a formal review of the policy for autorotation training be conducted. The resulting policy must ensure that pilots have the skills and knowledge to preserve life and limb during helicopter emergencies requiring autorotation. It should also maximize the potential for saving the aircraft in such an emergency, but only to the extent that it does not unnecessarily jeopardize aircraft or crew in training.

b as a part of the above review, the possibility of establishing wind variability limitations for autorotation training be investigated.

c. the feasibility of employing wind and video recording equipment at 'Grabber Green' be investigated.

d. more emphasis be placed during Supervisory and Proficiency Checks on low level save techniques and recognizing the parameters when a low level save/overshoot is required. ◆

1 Wing Flight Safety Newsletter

We have included, by exception, an insert in this issue of "*Flight Comment*." These articles reflect several perspectives on a 1 Wing incident, which has taught us some lessons about some of our vulnerabilities as "can do" aviators. While out of the normal "*Flight Comment*" format, we thought these articles excellent for stimulating thought, discussion, and self-examination. My hat is off to 1 Wing for being willing to look hard at what happened and to share the results of that introspection with the rest of us. This positive and active approach to promoting flight safety at all levels is a good example for everyone. ◆

Colonel Ron Harder
DFS

MR. ROBERT BLIZZARD
MR. BRUCE (HUTCH) HUTCHERSON

On Sunday, 22 Dec 2002, a civilian Lear jet, call sign N45NP, was conducting an instrument landing system (ILS) approach to runway 08 in Goose Bay, when he lost glide slope indications. As the terminal unit is closed on Sundays and precision approach radar (PAR) services are only available with two hours prior notification, control of the aircraft was handed off to Goose Bay tower directly from Gander Centre. The visibility at the time was _ mile in blowing snow, with a vertical visibility of 300 feet.

As a result of the loss of glide slope, the pilot conducted a missed approach and control was handed back to Gander Centre for another ILS approach. Once again, on the second approach, the aircraft lost lock on the glide slope and opted to overshoot. The tower controller, Mr. Hutcherson, in conjunction with the ground controller, Mr. Blizzard, (who happened to be PAR qualified) advised Gander that they might be able to conduct a PAR approach if the pilot was willing. The pilot accepted and Mr. Blizzard proceeded to the terminal building to open the unit and align the PAR.

While on Gander frequency, N45NP advised he was "fuel critical." Nine minutes (record time from tower cab to terminal, let alone opening up and aligning the PAR) after devising the plan, Mr. Blizzard coordinated transfer of control with Gander. The pilot advised that it was not his first PAR, but it had been awhile and he said, "We'll take all the help you can give us." One minute later, the pilot said "Be advised there is no ' go-around' on this one" and then declared a fuel emergency. Thirty-eight minutes after initial contact, N45NP landed safely in Goose Bay.

Mr. Hutcherson and Mr. Blizzard went beyond the scope of their normal duties and as a result of their professionalism, quick plan and control skills, they were able to safely recover an aircraft and two people. ◆

CORPORAL GREG ROGERS

On 28 May 2001, Corporal Rogers, an avionics technician, was performing a routine pre-flight check for bird nests on the search and rescue standby Hercules aircraft. While carrying out this customary examination, he noticed what appeared to be a crack in the skin of the rudder. Although not part of a regular bird nest inspection, Corporal Rogers decided to further investigate. Upon inspection, he discovered a crack of 15 mm in length in the rudder, as well as a large dent in the skin of the aircraft. Immediately, he halted his inspection and informed the servicing desk sergeant. Aircraft structures technicians investigated and concurred with the seriousness of the damage and the aircraft was declared unserviceable.

Thankfully, because of the proficiency of Corporal Rogers, this did not result in a flight safety incident. Corporal Rogers demonstrated superior professionalism and observation. His quick, decisive actions ensured that a potentially disastrous flight safety hazarded was averted and corrected. ◆

MASTER SEAMAN MARK VANDERHEYDEN

In April 2002, during a hot fuelling operation on HMCS Vancouver, the flight deck engineer, Master Seaman (MS) Vanderheyden, noticed that it was taking longer than usual to fuel the helicopter. After the hot fuel was completed, he took the initiative to inspect the fuel hose in-line filter for any evidence of blockage. He found a severe delaminating of the inner hose lining, which was plugging the in-line hose filter.

Realizing that two helicopters ("Renegade 440" from HMCS Ottawa and "Slapshot 429" from HMCS Vancouver) had recently been fuelled using the defective hose, the HMCS Vancouver's Air Chief recommended grounding both helicopters until the level of contamination could be determined. "Renegade 440" was contaminant free, but "Slapshot 429" had evidence of small rubber particles in the fuselage fuel filters. A flight safety message was initiated and "Slapshot 429" had a complete fuel cell inspection carried out by the HMCS Vancouver maintenance crew. The fuel cell inspection revealed no contamination in the two fuel tanks.

MS Vanderheyden's quick reaction to an abnormal fuelling rate and his fine eye to detail prevented a severe fuel contamination problem from occurring in "Slapshot 429." Without his diligence, a catastrophic dual engine failure could have been the result. His prompt actions allowed two Sea Kings to be quickly returned to flight status during the OP APOLLO deployment. ◆

MASTER CORPORAL DARRELL SHIELS

In August 2002, Master Corporal Shiels, while conducting a routine corrosion control inspection on Sea King #416, discovered that the electrical leads on the #1 engine fire bottle were connected in reverse. This mix-up rendered the emergency extinguishing system inoperative.

It is very difficult to see the labels on the cable assembly where they connect to the fire extinguisher system valve when the access panels are installed. The #2 corrosion control inspection requires the area to be accessed, however it does not call for inspection of the fire bottle. Had this discrepancy continued to go undetected, the potential for a serious accident was significant, as the capability to fight an in-flight engine fire was greatly impeded.

Master Corporal Shiels' in-depth knowledge of aircraft systems, professionalism, and initiative prevented the possible loss of a valuable aviation asset and the potential for serious or fatal injury to the crew. Master Corporal Shiels is to be commended for his outstanding professionalism, alertness and dedication. ◆

CORPORAL BOB MCDEVITT

On 19 April 2002, Halifax Air Traffic Control (ATC) advised 12 Wing Shearwater ATC that they had a Piper Saratoga PA-32 who was experiencing difficulty with the instrument landing system (ILS) approach to Halifax International airport and had lost the localizer on two occasions. Halifax ATC asked if Shearwater ATC could attempt to recover the PA-32 using their precision approach radar (PAR), since the weather at the Halifax airport was instrument flight rules (IFR) at the time.

Corporal McDevitt was the duty radar controller and, after receiving a briefing from the terminal controller, made radio contact with the PA-32 pilot. While controlling, Corporal McDevitt noticed that the Piper aircraft had descended approximately four hundred feet below the minimum safe altitude (MSA) and immediately initiated corrective action. As the PAR progressed, he recognized that the pilot was experiencing difficulty maintaining assigned headings. Corporal McDevitt suspected that the aircraft might have a defective compass, and briefed the Piper pilot on how to fly a "no-compass" approach. Although the pilot sounded quite shaken up and lacking in confidence, Corporal McDevitt initiated a "no-compass" approach to facilitate a safe transition to visual weather conditions and to help calm the pilot.

Corporal McDevitt was instrumental in alleviating what could have easily resulted in a catastrophic accident. After two unsuccessful ILS approaches at the Halifax airport, the pilot of the PA-32 was noticeably upset and very nervous. Corporal McDevitt's calm, professional demeanor throughout the whole situation influenced the pilot's confidence resulting in a successful recovery at 12 Wing Shearwater. ◆

SERGEANT RUSS MUIR

During Sergeant Muir's pre-flight inspection on a Hercules aircraft, concern raised from a previous snag involving the electrical power distribution system on another Hercules caused him to go beyond normal pre-flight checklist requirements and inspect the electrical direct current (DC) transformer rectifier unit (TRU) more closely. When he pulled the #1 essential DC TRU, he noticed that the load on the #2 TRU dropped off line, and that when the # 2 essential DC TRU was pulled, the #1 TRU dropped off line. He suspected a wiring problem and alerted servicing personnel. This error was confirmed by servicing personnel and rectified.

Sergeant Muir demonstrated the utmost vigilance when he discovered two electrical TRUs that were incorrectly cross-wired. At the very least, this could have lead to a confusing emergency checklist response had one of the TRUs failed and, quite possibly, could have resulted in more serious consequences. Sergeant Muir's exemplary level of concern and vigilance resulted in the discovery of a very serious hazard to flight safety that could have easily gone undetected for some time. His actions and attention to detail on this day exemplify an outstanding commitment of the Flight Safety program. ◆

MS. CHANTAL GAGNON

On 27 August 2002, Ms. Chantal Gagnon, a Bombardier Aerospace journeyman technician at NATO Flying Training Centre (NFTC) Moose Jaw, was assigned to recover CT-155205, an arriving NFTC Hawk aircraft. While performing the turn-around inspection, Ms. Gagnon noticed two centre line fuel tank (CLT) forward mounting bolts were still in their forward holes, inside the wheel well bays, although the CLT had been downloaded. The location is very difficult to see, as the mounting holes are located behind a maze of fuel and hydraulic lines and wire bundles. This is not a checklist item specifically identified in the turn-around inspection procedure and this condition was unobserved during previous inspections on the aircraft. Ms. Gagnon immediately notified her supervisor and raised a flight safety initial occurrence report.

During the subsequent investigation, it was found that only their last thread secured the six-inch bolts. The bolts could have readily become dislodged within the landing gear assembly, damaging fuel and/or hydraulic lines and electrical cables. They could also easily have interfered with the proper functioning of the landing gear.

Ms. Gagnon's diligent performance demonstrates her outstanding professionalism. Additionally, her professional expertise and attention to detail, combined with her superior flight safety work ethic likely prevented a potentially hazardous in-flight emergency. ◆

CORPORAL RÉMI SIMARD

Corporal Simard is an aviation technician working in second line maintenance (snags) at 433 Tactical Fighter Squadron. As maintenance personnel were carrying out an inspection on Hornet #917, they noted that hydraulic line # 74A6691068-1003 was rubbing against panel 113L. To access this line and correct the problem, personnel were required to take off both the hydraulic driving unit (HDU) and the remote valve.

Following the re-installation of the hydraulic line, Corporal Simard was asked to reinstall both the previously removed HDU and the remote valve. Attentive to the safety details of the completed work and ensuring that nothing was missed, he carried out a detailed foreign object damage (FOD) check and inspected the area for tidiness. Despite the fact that the work-space was quite restrained and dark, his inspection revealed a substantial crack on the remote control bracket. Corporal Simard's attention to detail led to a flight safety report.

Corporal Simard's professionalism, alertness, and quick reaction revealed this undetected problem, thus preventing a possible serious incident. Without his initiative, this damaged bracket could have failed in flight, which could have had disastrous consequences. ◆

SERGEANT STEVE TREMBLAY

Sergeant Tremblay was tasked to carry out an ordnance pre-flight inspection on Aurora #103, prior to a maritime patrol mission. During the inspection, the flight engineer questioned the weight limitations for the rack and, subsequently, Sergeant Tremblay was asked to move the stores around to rectify the problem. While moving the stores, he noticed that the weight distribution for the MK 58 smokes did not seem right. Upon opening the sonobuoy launch container, it was noticed that the smokes were packed incorrectly; the smoke canister was packed next to the explosive cartridge actuated device.

Upon further inspection by the technicians, it was found that twelve of the thirteen smokes on the aircraft were packed incorrectly. It is the responsibility of the AESOP to verify the load on the aircraft, however, they are not required to physically open the canisters to check the contents. Had this gone unnoticed, a potential existed for a fire in the pressurized sonobuoy launch tubes upon stores release.

Sergeant Tremblay's alertness and commitment to his duties were instrumental in preventing a serious accident. He is to be commended for his professionalism and dedication that led to this discovery. ◆