flying

SAFETY

DECEMBER 1983

The Mission . . . And The Man

Mayday . . . Mayday . . . Mayday

Safety Lessons Learned

I Learnt About Flying From That

Adapted from Air Clues, *August 1983*

■ I was on my first tour on Canberra PR7s in Germany as a young and inexperienced pilot officer. My navigator was also inexperienced. We were both fully operational. Most of our squadron flying consisted of low-level photo recce sorties over Germany. Sometimes we went to the UK on a high-low-high profile. When the North European weather was bad, we even went to Corsica and back non-stop with 45 minutes low level at the far end — such was the range of the Canberra.

One day we set off on a low-level sortie over the north German Plain — as we had done so many times before. The weather was rather indifferent — cloudy with reasonable visibility, but the met man had said that we might encounter the odd patch of very low stratus almost anywhere. He was right for a change, and I could see a marked deterioration in the low-level weather looming up ahead of us. No sweat, I thought, we'll just pop up over it, or through it if necessary, and carry on low level beyond it. I eased the aircraft gently up to 1,000 feet, and transferred to instruments as we entered a cloud. From the forecast, I did not expect to be in it for very long, and so I became a little irritated when we had not come out of the gloom after a minute or two.

My navigator was in his usual prone position in the nose, but rather than asking him to tell me if he could see a gap in the cloud, I stupidly decided to try to find one myself. At the time, I did not foresee any great problem with this, as I was flying at 250 knots straight and level — or so I thought.

In my determination to find a way out of the cloud, my attention to the instruments must have subconsciously diminished. On looking back at the dials, after one of my fruitless searches for a gap in the opaque grey world outside, I noticed, to my horror, the VVI coming to rest upon maximum indicated rate of descent. I pulled the control column fully against the back stop and I felt the aircraft start to respond. I have no idea how much G we pulled as we did not have accelerometers fitted — not that I really cared.

Suddenly we came out of the weather over the middle of a big green field, heading toward a large bushy tree well above us — I can see it now. I realized that we had missed the ground but I thought we were going to hit the tree. Luckily we just missed it (thanks to the marvelous design of the Canberra's wing) and shot back into the cloud. Very unsettled, I opened up to full power, and with much relief saw a good rate of climb on the altimeter. I concentrated on keeping the wings level in a climbing attitude to the detriment of my instrument scan.

The aircraft became rather quiet and light on the controls which made me check the airspeed. My God, I thought, we're going into a low-level unusual position. By now I was really frightened, but at that moment we burst out of the cloud tops at a hideous climbing angle and very low speed, with most of the lift coming from the engines. Somehow, I managed to prevent the aircraft stalling back into the cloud. Very shaken, we flew around for a while before returning to base, lucky to be alive and with a big dent in my pride. I was far too ashamed of myself even to consider telling anyone about our experience at the time.

What did I learn from this near accident? Well, I will leave my readers to count up my mistakes — but I never again carried out a half-baked low-level abort procedure. ■

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DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, USAF

The Good Old Days

MAJ ERNEST A. BRIGGS, CF
Directorate of Aerospace Safety

■ Tommy had a dream. Tom grew up in a small prairie town situated near an Air Force base. Several of his relatives and friends had farms right under the flying training area. For as long as he could remember, Tom loved to visit these farms and watch the trainer aircraft do their maneuvers overhead. Tom made a decision early in life that he wanted to be a military pilot. His father often told him stories about flying fighters and of being an instructor pilot during the war. These many exciting adventures served to intensify his dream of becoming a pilot.

Even as a young lad, Tom singlemindedly pursued his goal. He was a good student and an excellent athlete. After completing high school, he went on to a university to major in aeronautical engineering. While at the university, he placed second in the state tennis championship for 2 years and graduated with honors in minimum time. After graduation, he was, at long last, actively engaged in realizing his life-long dream of being a military pilot. As luck would have it, he was ordered to the flying training base near his home town. This made it easy for him to take the short trip home on weekends. He returned, a hero to his local buddies, a source of never-ending pride for his family and recent fiancee. Now he had stories of his own to tell. He was doing well in his training, happy and excited to be on his way to fulfilling his ambition. He was on top of the world. Everyone was happy for this intelligent, polite, well-rounded, handsome young man.

On one weekend trip home, accompanied by a fellow classmate, Tom stopped en route at cousin Jim's farm for dinner. As always, several relatives and friends gathered, and Tom and his friend regaled the group with stories of pilot training and their recently completed first solo. Some of the stories that evening recalled the "good old days" when Tom's father was an instructor pilot at the same base and how he would visit the farms and put on some pretty fancy displays of flying skill around the local barnyards. Tom had heard these stories many times as he was growing up but never failed to get a thrill at their retelling. Leaving that evening for the short drive to his hometown, Tom told them he would return soon. After a relaxing weekend at home, Tom and his friend left early on Sunday for the short drive back to base. Both were keen students and wanted time to prepare for the next day's flights.

Monday dawned clear and cool; Tom was ready to fly. Completing an early morning flight with his instructor, Tom was briefed for his second launch, his second solo in the sleek jet trainer. This trip would be his first solo to the practice flying area.

Tom's Aunt Amanda was working in the kitchen. She had spent her whole life in the flying area and seldom took notice of the many aircraft. This one sounded different and much closer than usual. She went to the back porch in time to see a jet racing straight toward the house and at the last moment pull up abruptly and turn away to the southwest.

"That must be Tommy!" She thought.

Tom was in the aircraft, and he was having fun.

"Boy, I'll bet Aunty never saw a pass like that! Hey! There's cousin Jim's place. I told them I'd be back soon."

He made a pass near the farm buildings, low and fast.

"That'll let them know I'm here."

The whole family heard the noise and tumbled out of the house and barn to watch Tom swing around and fly in for another pass by the farmhouse. As the jet swished by and the wing tipped toward them, they all jumped and waved and shouted. The aircraft was so close they could see the helmeted figure raise his hand and wave. Tom saw them and knew they were enjoying this show. When he directed his attention back to the aircraft, he was inverted!! The most talented instructor pilot could not have recovered from such a position. ■

F-16 EUPHORIA

COLONEL M.B. "DUKE" JOHNSTON (Ret)

■ Many years ago, flying the F-104 Starfighter was described as strapping the airplane to your tush, instead of merely getting into the cockpit. Instructor pilots for years used that line or a similar one to describe the philosophy of becoming part of your airplane before you could be the ultimate weapon. After flying the F-16 nearly 10 years I believe that most young fighter pilots, as well as old ones, really have that attitude when flying this aircraft.

The cockpit environment was not only a pleasant surprise, but the transition to a tilted seat (30°), side stick control, and magnificent bubble canopy design was as natural as a fish taking to water. As good as this sounds to the fighter pilot, there is hidden in this evolutionary fighter cockpit design a phenomenon which I call "F-16 euphoria." It could also be described as that super comfortable feeling you get sitting in a reclining chair with a drink in your hand.

This euphoria is disarming and unpretentious. The feeling of well-being in a relatively quiet, comfortable cockpit is a new phenomenon in fighter aircraft. The problem stems from lack of concentration — a detachment from the danger of your environment. An old fighter pilot once remarked, "The probability of being killed from hitting the ground is higher than from any weapon."

Recently, two F-16 accidents resulted in two fatalities. In both cases, high G forces were experienced prior to the crash. The answer as to what really happened may never be known; however, there remains the possibility that a lackadaisical attitude about imminent danger in the F-16 cockpit could have been a contributing factor.

What is the answer to this quandary — redesign, artificial warnings, flight restrictions? Maybe, but the basic answer is awareness. Recognize and resist the F-16 complacency or euphoria. The need to emphasize the danger of flying fighters out of the envelope or low to the ground is still as true in the F-16 as it ever was in other aircraft.

Euphoria by definition is: "A feeling of well-being or elation." Be elated to fly the F-16 but — don't be casual or so comfortable that you allow yourself to become a fatality. Remember, at 500 feet, 500 knots, you're three heartbeats away from your Maker in any aircraft. ■

THE MISSION . . . AND THE MAN

LT COL JIM BUSTLE (RET)

Our mishap records show that in many cases, the underlying cause was the pilot's inability to cope with the situation, for whatever reason. This problem is one which every supervisor faces — how to match pilot capability to mission requirements. The following article, though written from the fighter perspective, is just as applicable in a transport squadron. It is, of course, not the only approach. In fact, as Col Bustle says, supervisors have always made these decisions. The purpose of this article is not to suggest that any supervisor or unit has a problem, but rather to stimulate discussion and thought about how we can do our job better.

■ He flew on the wing of an attached Old Head one day, and when they came down, Graybeard took him aside and said, 'Son, you've gotta fly better than that to stay in fighters.'' A few weeks later, Stanley Stonehands was Number 2 with Graybeard as Number 4 in the same flight. After landing, they debriefed, and Graybeard visited the Ops officer where he asked, ''Are you guys really watching Stanley?'' He got some consoling words and backed off. After another flight with Stanley, Graybeard went to the squadron commander and bleated, ''He's going to kill himself or somebody else if you don't *do* something.'' So they did something. They made Stanley a flight leader. He died 108 days later in an operations mishap.

Why? Why was something so obvious to Graybeard but not at all apparent to the squadron honchos? Oh, I know the squadron bosses can't go off the charts each time somebody says ''. . . gonna kill himself . . .,'' but judgments as to individual pilot qualifications shouldn't vary greatly from one supervisor to another, so why didn't they stop Stanley before Stanley stopped Stanley? Here's why.

- There is a good deal of supervisor accommodation to a situation, i.e., you can grow to *expect* so-and-so to be weak and when that proves to be the case, no alarms go off.
- Supers may agree that a guy is weak, but differ greatly as to how weak.
- Some supers would rather risk a mishap than offend a jock.
- Some so-called supervisors are weaker than the supervisees.

All of which means we need a better system to support operational supervision. I think we may have found one.

Designing a different method was frustrating at first, because even good Ops supervisors have forever been relying on intuition modified by experience and supported by more than a little luck. The trick was to bottle up that intuition (or judgment, or grasp, or whatever it should be called) and make it available to those who don't have it.

And you can't do that. Still, there had to be a way to arrive at those same or similar judgments without waiting for wrinkles and

without creating another monster. Obviously, risk appraisal had to be a part of it (compliments to Major Reid, *TAC Attack,* Aug 79), but we really needed a more direct method to manage the risk — and I hope that distinction is not too subtle.

Now don't stop reading. I don't claim all of this is brand new. Most of the time, things purporting to be new and different in safety turn out to be about as unique as acne and about as interesting as watching paint dry. So, while the subject here is not new, I think the methodology is.

First, to define the problem. I started out looking for a way to eliminate all aircraft bashes. I got only a headache. Let's face it: You'll never do away with the freak mishap, and you probably won't prevent the one that devolves from the willful violation. Further, the materiel failure crashes are pretty much beyond us Ops types, so my own focus slowly narrowed to the middle — perhaps 80 percent — of the command control spectrum as the most fertile field for this endeavor.

With the task defined that way, suddenly things didn't look too tough. The Old Buzzard knows that mission complexity is a killer, and that the level of complexity is determined by events and conditions. He also knows that the only thing that can mitigate mission complexity is pilot capability. So, if we're to do it safely, this equation has to prevail:

Pilot Capability $\geq$ Mission Demands. We've always known that, but we haven't tried to quantify that equation in any mathematical sense. That's really all we're doing here, i.e., striking a balance between the load a pilot must carry and his own capability limits.

A matrix such as that in Figure 1 can give us half the equation. This chart, of course, is for the A-7. The weights are arbitrary and will vary according to who is making it up. That's OK, as long as I use my chart while you use yours, etc. Remember, this is just a tool. If you're going to use it, shape it to fit your hand.

Okay, with the various weights and ranges decided upon, we merely pick a given mission and run across the matrix, adding up the applicable figures (including the variable weights we assign on the spot) and we end up with a "complexity index."

On the A-7 matrix in Figure 1, the most complex and demanding mission we would reasonably schedule runs to, perhaps, 75. Even that one should not be insurmountable for the strong jock . . . and there, indeed, is the key: The pilot. How do we rate him? Try this logic:

- Mission complexity is offset by pilot ability
- The able and proficient pilot can handle anything reasonable
- The most demanding mission shouldn't exceed about 75 (in the A-7 example here)
- Therefore, the strongest pilot index = 75.

Having decided that, it's all downhill. We break it out by simply asking what factors (and their relative merits) are important in the pilot's makeup. Again, dealer's choice, but here are ours (see Figure 2):

- Ability = 20 points (average = 10).
- Experience = 20 points (15 for fighter time, 5 for UE).
- Proficiency = 20 points (av = 10).
- Discipline = 15 points (av = 10).
- Fatigue = -10 to zero. continued

MISSION INDEXES			
MISSION	LOW	AVERAGE	HIGH
SAR	7	42	88
SAT	11	25	85
WD	7	17	56
DACT	10	16	54
ACM	8	16	37
BFM	4	4	24
INSTR	4	5	22
TRANS	3	3	18

PILOT INDEXES		
LOW	AVERAGE	HIGH
14	30	45
(Proficiency not included)		

Figure 1

AIRCREW EVALUATION

PILOT	(20) Ability	(15) Discipline	Exper		(20) Prof	(-10 to 0) Fatigue	Total
			FTR(15)	UE(5)			
ABLE	6	5	3	3	✓		17
BAKER	14	15	7	3			39
CHARLIE	12	10	3	2			27
DAN	13	10	3	3			29
EDSEL	10	10	10	3			33
FLINT	12	10	4	4			30
GEORGE	7	5	2	2			16

Figure 2

"Aviation in itself is not inherently dangerous, but to an even greater degree than the sea, it is terribly unforgiving of any carelessness, incapacity or neglect."

(Author Unknown)

Yes, the weights are arbitrary. If you make up your own mission matrix weights, make up your own pilot eval weights, too, but base it on one central precept: The strongest pilot can handle about anything you can reasonably throw at him. There are a couple of other "must do's":

- Assign the ability value without regard for rank or experience. The strongest pilot may be the 4,000-hour lieutenant colonel with a 13, or he may be the 1,300-hour captain with a 15, followed by a 2,500-hour major with a 12, followed by a lieutenant with a 9. So be it. Use your best estimate unhampered by a pre-existent image of what things should be like.
- "Discipline" is used in its very inclusive definition. It is discipline and judgment and restraint and forbearance and behavior and on-duty and off-duty and . . . How does the guy think? Our average pilot is very disciplined, i.e., a 10. Some are true by-the-book taskmasters, on and off duty, for themselves as well as others; make him a 15. Some are great guys with good hands . . . and a cavalier disregard for the more mundane restrictions; maybe they are an 8. Then there's the guy with lots of deep, personal problems. These distractive influences may make him a 5. The flake is a zero. The question mark is likewise a zero.
- Experience is simple: 1 point per hundred hours of fighter time up to a max of 15. Same for UE time but only to a max of five points.
- Proficiency means across-the-board. Is he proficient in every event he's going to attempt on a given flight? And don't satisfy yourself with merely how often he has flown in the past month. The question was and is: How proficient *is* he, not how proficient *should* he be. And, oh yes, you can run out everything else in advance, but proficiency and fatigue are real-time assessments.
- Fatigue is a minus value. Fully rested, he's a zero. If he triple-bangs, don't kid yourself that he's as sharp on the third go. And don't retreat into the convenient refuge of "I scheduled him for 12 hours of crew rest." If you don't know, OK, but, if you're sure he was swingin' until O'dark-thirty, a minus 8 may be in order.

Now by simple addition, you have the other half of the equation and can eliminate command control accidents, right? Hardly. But when you compare the mission index with the pilot index, you'll feel a lot better if the latter is higher. And, in the long run, we will save an air 'chine or three.

No, it's not a big chore at all, Mr. Commander/Ops Officer. In fact, I think you'll be surprised at how simple it really is. It will take some thought to make an inclusive mission matrix for your weapons system, but you owe that to yourself, anyway. You'll quickly see which of your profiles are straight vanilla and which ones are more sporty, but you may be intrigued at how great a difference there is.

As to pilots, the evals are similarly easy, and whether he uses this system or some other one, the Ops officer has to make tough judgments if he's to earn his pay.

The big question: Does this change the human pilot into a nonhuman number? No way. It makes things even more human, because the pilot index must be reviewed for changes every so often. Each time you pick up another hundred hours, demonstrate good judgment, or show soft hands, your stock goes up. That ain't no bad deal. In outfits now, it can take five years of "attaboys" to wipe out one "aw, shucks." The completed pilot evaluation sheets should not be shown around, of course, but the blank forms certainly may be. Nothing wrong with letting people know which areas are considered important. And, let's be honest. We pretty well know where we stand in comparison to other pilots, anyway. It may not be where we'd like, and we may tell our wives something else, but if you look around and have to say to yourself, "There are six jocks in this outfit that are better than I," you're probably right.

The supervisor's worries, of course, are going to be with sticky missions and the less able pilots. That's the way it's always been, and we've always tried to judge these things, but more with a guess than a system. When you make your pilot evaluations, you'll probably have only a few that fall out as worries. The rest will be up toward average or above. Fine! Also, not many of your missions are going to have complexity indexes toward maximum. Again, fine! It means you can put your supervisory talent where it's most needed. Figure 3 indicates that the

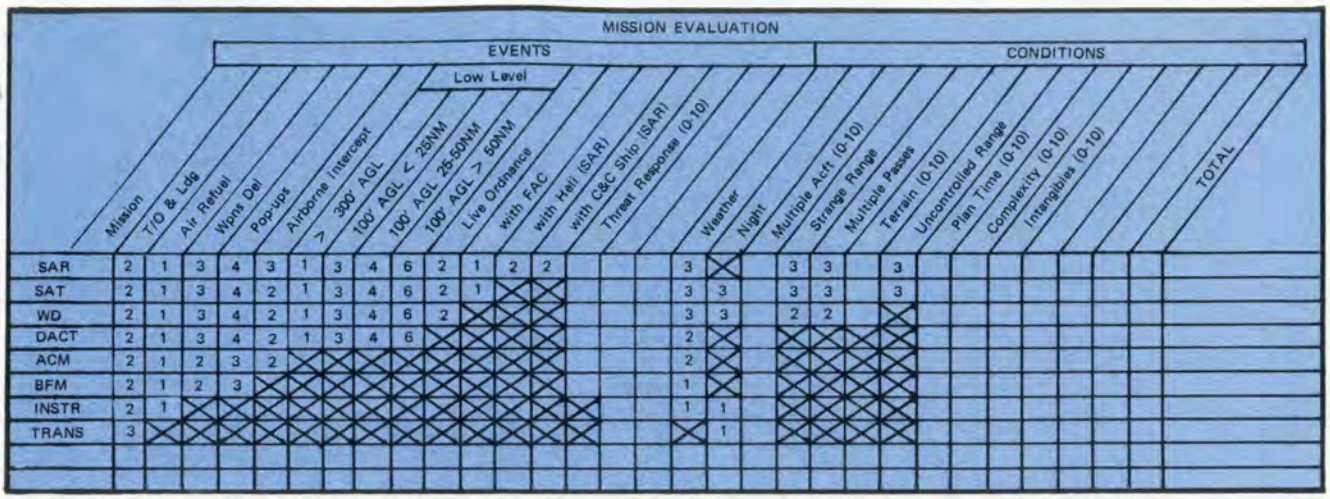


Figure 3

"average" pilot — basic index of 30 which increases with a proficiency factor added — should be equal to all but a few of the more complex missions. Even a "20" with average proficiency can handle most of them.

So you do the mission evaluation and pilot evaluation tricks and find you can't always assure that pilot indexes are higher than mission indexes. What now? I'll opt for some careful averaging. If the mission index is 40 and one or more of the pilot indexes is/are 20 or thereabouts, I want a "50" out front and maybe a "45" backing him up. I am absolutely persuaded that you have to honor the averages in the long run or lose some aircraft.

You might also get turned off if you do all the above and still lose an aircraft flown by an experienced IP on a sortie even an 0-6 could handle. Don't. This process won't prevent the freak accident, remember? It won't cause one either, so you're not going to lose a penny by trying it.

Now, does the super Ops officer or commander need this system?

Probably not, if:

- He's been in the saddle long enough to know his people.
- He has the experience and judgment the job requires.
- He's not reluctant to call a spade a flippin' shovel. But hear this fellow mercenaries: The really super Ops type has his own system to do just what we're talking about here, i.e., matching man and mission.

If you're still with me, here's the big finish. After sketching out the above system, I ran in some real-life situations and found the expected.

- The complexity of TAC's missions has continually increased over the last seven years.
- Missions flown while deployed almost invariably total up to a higher complexity index than is the case on local sorties.
- The average pilot index was 30 — 40 with average proficiency allowed — but the mission complexity index is above that in five cases.

Then came the little bombshell that was not so expected. In one wing — selected because the info was available and reliable — the last five command control accidents involved pilots whose indexes ranged from 15 to 22 — proficiency values not included — on missions with counts running from 39 to above 70! Surprised? Welcome to my nightmare.

It boils down to this. Fighter airplanes are inanimate aluminum contraptions that can be spit out at 30-40 a month, once the line gets rolling, but they cost megabucks. Pilots, on the other hand, are 175-pound servolinear mechanisms cheaply produced by completely unskilled labor, but the process takes 24 years! We need both, so we've got to find a way — a better way — of preserving what we have.

At the squadron level we can't do much about the capability of the new guy coming in the door. But this we do know — the fighter jock has the most demanding job in the air so we have to pick commanders that love their guys enough to bust 'em out of fighters if they don't have the hands for it. It's tough, but not as heart-wrenching as memorial services.

I hope you'll try Step 1 — making up your own mission evaluation material — because then you'll go on to Step 2 (pilot evaluations). After that, Mr. Commander/Ops Officer/other supervisor, the obvious: Check pilots against daily missions — use spot-check or weak-link practices if you wish — and make sure you're comfortable with the match-ups. If not, lighten the load or send a stronger horse. ■

PASS IT ON,

COLONEL

REPLY TO ATTN OF:
Lt Freshout of-UPT
SUBJECT:
Dissemination of
Flying Experience
TO:
Colonel Megahours Pilottime,
Attached For Flying,
Anywhere AFB

■ Sir, I hope you will not take offense at anything that I have to say. I may step on some toes, but I think that these things need to be said. The fact is, sir, I need you.

Let me begin by saying that I hold you in great awe. You flew in 'Nam and Korea. You've flown over places and bombed places that I have only read about. While you were chasing MIGs and dodging SAMs, I was in the back yard playing soldier with stickguns. Your stories keep me enthralled for hours. You've flown P-47s, P-51s, F-80s, Huns, Voodoos, Deuces, and many more. Why, I never had that many plastic models! You've had every in-flight emergency twice over. You've landed at fields that were WOXOF. It's been rumored that you've buzzed houses, water skiers, and even flown under bridges and power lines.

You are a modern day barnstormer held in high esteem. You have an aura about you that all old fighter pilots have. My fellow brown-bars and I retell your stories even when you aren't there. "The colonel said that he was chasing a MIG in an F-86 once and . . ." we say, as we run intercepts with our hands. It's reciting mythology, your mythology. You are our "God of Flying." We worship, respect, and attempt to copy. If only we could become a fighter pilot like you, we dream!

This sir, is the problem. Many of us young pilots look upon you as the model for our flying development. We strive to be like you in every way. Therefore, when you talk of violating regulations, buzzing houses, etc., we see this as part of "being a real fighter pilot."

Sir, I'm asking you to take a long, hard look at yourself. Are you giving us the right example to follow? Are you being the correct frame of reference on which we can base our flying? Are you doing all you can to instill professionalism and safety in us? It's not really your deeds that we try to copy. We try to emulate your attitudes. After all, we want to be fighter pilots, too!

Let me be specific. You routinely show up late for briefings. You are ready to fly — never checking weather, preflighting your personal equipment, or even the aircraft preflight. What are you telling me about a pilot's responsibilities? Sure, it looks sporty to fly with your sleeves rolled up and your gloves rolled down; and who needs a checklist? What are you telling me about a pilot's regard for safety? You've flown in and out of clouds VFR all your life. ("It's fun dodging clouds.") What are you telling me about a pilot's regard for regulations? You are constantly asking me for ops limits. You even need coaching to fill out a boldface test. What are you telling me about a pilot's professionalism?

The Air Force has invested 25-plus years and five thousand hours in you. Your expertise and experience is a resource that remains untapped. You could use them to help those of us who so desperately need it, but you don't. You fly the entire mission while I play navigator, radio operator, and passenger. Have you ever thought that the techniques you've picked up over the years could help me to be a better pilot? If I never touch the stick when we fly, how can you evaluate my flying? How can you help me to improve? The Air Force, and eventually all of us, are the losers. Help us low-timers to be better pilots because we have flown with you. Use your experience to help us safely and professionally get our experience.

Remember, we who are still wet behind the ears are attempting to copy you and your ways. You are under the spotlight. Our focus is on you. Help us to see the best you have to offer. Give us the professional example that we need, deserve and can emulate.

Think back to the last time you held us in awe with your daring deeds. When was the last time you told us about cancelling a mission for weather, going missed approach, turning down an unsafe airplane? When was the last time you bragged to us about your professionalism?

Don't forget us brown-bars, sir. Let us learn from your example of a truly professional "fighter pilot." We need you!!

Freshout of-UPT, 2Lt
Anywhere AFB

— adapted from April 1979, Aerospace Safety. ■

MAYDAY . . .
MAYDAY . . .
MAYDAY . . .

TSGT ROBERT D. BENTLEY
3636 CCTW Life Support Monitor
Fairchild AFB, WA

This is Pecan 04 . . . Be advised that I have an inflight emergency.

I have fire in number two engine.

Pecan 04 this is Atlanta Center. What is your position?

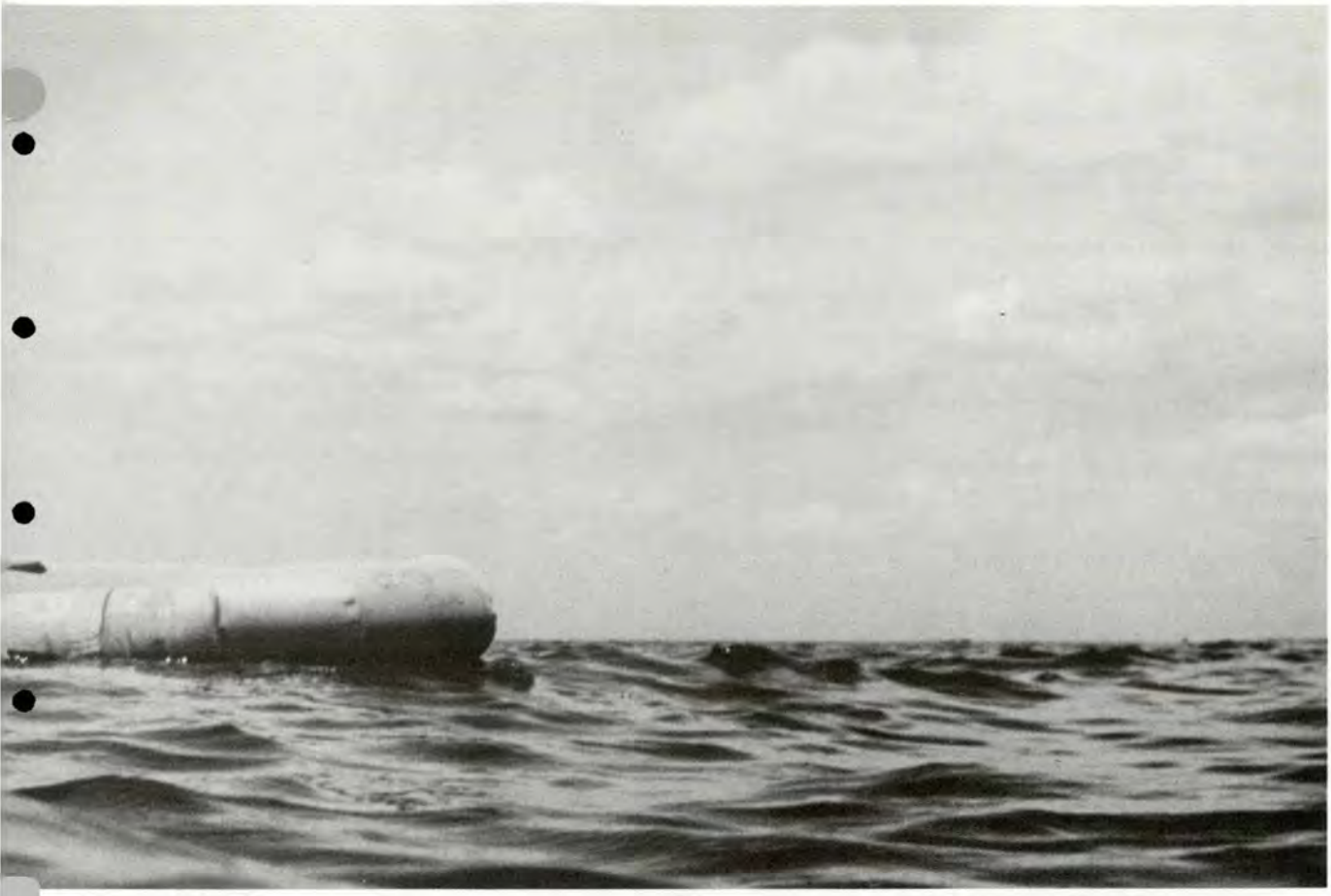
Atlanta Center this is 04, I've just lost both engines. It's time to get out. My position is . . .

■ I still recall those terrifying moments that nearly ended my life. My name is Jim Neptune, USAF; I'm 38 years old and in fairly good physical condition. Until the incident, I thought I was the best fighter jock in the Air Force. It took me months to feel confident in the cockpit again and after two years, I still live with the memories of that day.

It was Friday, 23 April 1981. The entire week had gone well and I anticipated this day would go likewise. I was looking forward to the weekend. All I could think about was that my son Bill's basketball team had made it to the playoffs and the big game was later that night. I had also promised the family that we would spend the weekend backpacking. As I was getting dressed, I noticed my personal survival kit on the shelf in the closet. Thinking that I was only scheduled to fly one short local sortie, I decided to leave the kit at home.

Just before leaving the house, I recalled telling my wife not to forget to pick up the items we needed for the weekend outing. As I arrived at work, I noticed that Ray Cannon had left his car lights on. The car doors were locked, so I had to go find him. My brief time was scheduled for 0615; I was running about 10 minutes late. As I entered the briefing room, I recall the Squadron Commander saying that it was nice that I could join them. The rest of the guys had a good laugh but I didn't find it very amusing. During the briefing, my mind wandered thinking about how great the weekend would be. The briefing was nothing special, so I didn't feel I had missed any important information.

After the briefing, I stopped by the SOF desk to make a final check on the weather prior to going to the life support shop to pick up my gear. While in the life support shop, the Commander called me aside and asked, "Is everything all right, Jim? It seems your mind is elsewhere



today.'' I told him that everything was fine and apologized for being late. I pressed on to my aircraft. While conducting my preflight, I noticed fuel on the ground under the number one engine. After checking the engine, the crew chief and I felt confident that the fuel was just spillage and chose not to call maintenance or delay the mission. After all, just as soon as I completed this flight, I was free for the weekend.

I was about 30 minutes into the mission; everything was going well. We had split up into single ship for intercepts when about 20 miles off the coast, all hell broke loose. I heard a loud explosion and felt the aircraft vibrating. The right engine fire light popped on, fuel flow was fluctuating, hydraulic pressure was zero, and I began smelling fumes in the cockpit. I stop-cocked the throttle and turned towards land, but the fire light didn't go out. At this point, I made my MAYDAY call. Atlanta Center answered, but before I could say anything else, number one engine fire light lit up and the cockpit really started filling with smoke. I knew then I was in deep serious. The bird became hard to control and I knew I didn't have much time. As I was preparing the cockpit for ejection, I told Atlanta Center I had a fire in both engines and was ejecting. I recall Atlanta Center asking my position, but before I could answer, the aircraft yawed violently and rolled inverted. All I remember doing was pulling the ejection handle.

The next thing I knew, I was hanging under the parachute. I must have been knocked unconscious during the ejection. I felt slightly dazed and my entire body was in pain. My right arm was bleeding and I couldn't feel anything in my right leg. I'm not ashamed to say that I was scared — Man, was I scared! All I could see was water and sky; then my parachute canopy started oscillating severely.

It dawned on me that I hadn't made the four-line jettison. I activated my life preservers and then pulled the four-line jettison. I don't know why I chose to activate the LPUs first. I guess I thought I would drown if I didn't. The sequence of events after that is still somewhat hazy, but I'll never forget being dragged by that parachute. I have never been so conscious of dying in my entire life. After I hit the water, I

continued

continued

expected the canopy to fall on top of me, but instead it remained inflated and was pulling me across the water at mach two. I was spinning like a top and couldn't get the canopy releases disconnected. The parachute must have pulled me a mile, or at least it seemed like a mile! I'm not sure how far it really was, but I know I was behind that thing for a long time. I kept telling myself that if I could just get one side released, everything would be all right.

I finally got the right side disconnected; however, the parachute continued to drag me. I really had to work at getting the other side separated. After swallowing half the ocean, I was free. I saw my raft floating close by. I tried to swim to it, but just didn't have the strength. Besides, did you ever try to throw up and swim at the same time? I felt something wrap around my leg. My thoughts were, "I've come this far only to be eaten by sharks."

I finally realized that it was the lanyard that attached the raft to my harness. I pulled the raft to me and boarded from the side. I made it in, only to find that I had punched a hole in the raft, probably with the damn canopy releases.

By this time, I was cold, wet, and extremely frustrated. I found the raft repair plugs in the accessory bag as advertised; however, I forgot to reclose the bag. The waves were high and the next thing I knew most of my equipment was washed overboard.

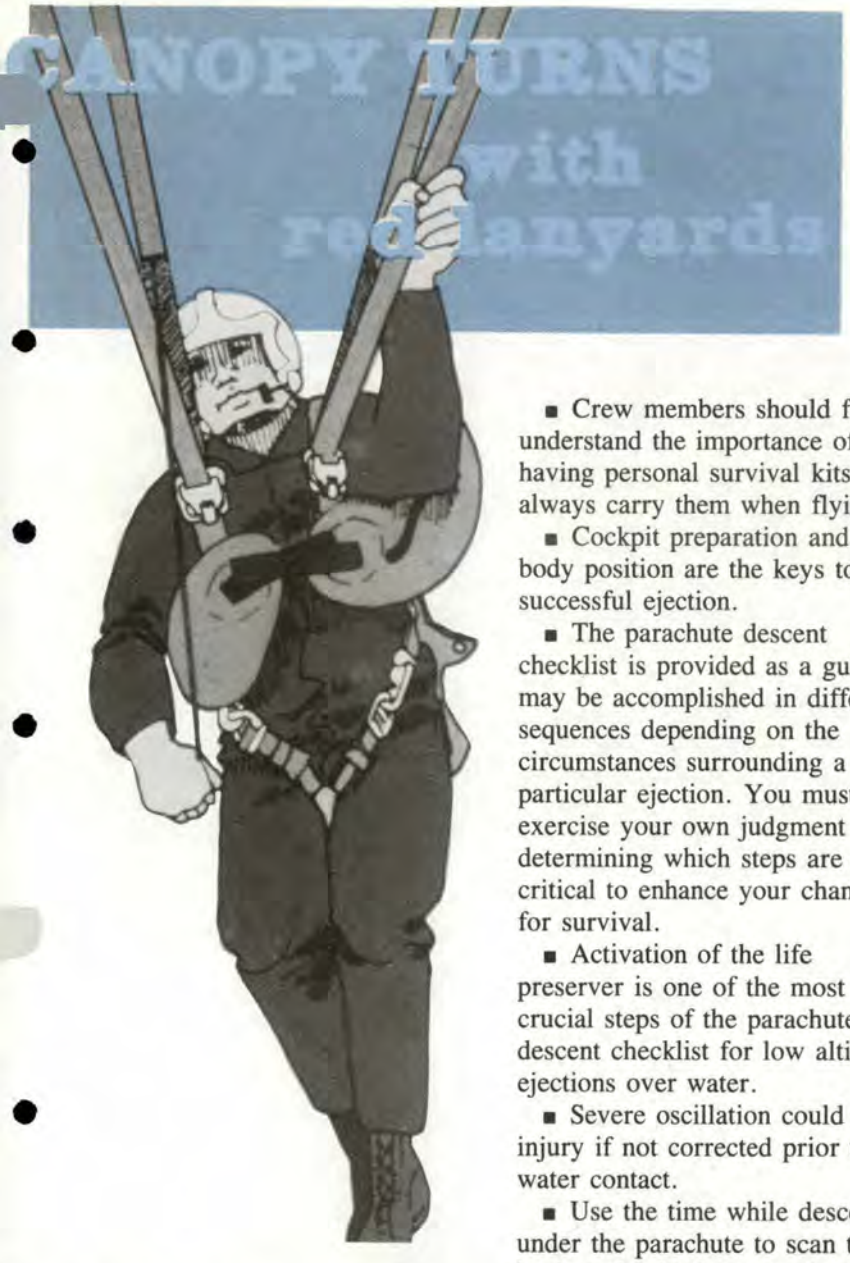
By now the saltwater was eating away at my wounds. Man, was I in a world of hurt! It was like someone was pouring alcohol on my arm. The pain was becoming unbearable. I dressed the wounds using my white cotton undershirt for bandages. I tried to get myself together and collect my thoughts. Between being cold and in pain, I didn't know how much longer I could hold on. I estimated that I was only a few miles off track when I had to eject, so Atlanta Center should have rescue on the way. I grabbed the survival radio and began calling for rescue.

"MAYDAY-MAYDAY-MAYDAY, THIS IS PECAN 04 — DO YOU READ ME?" I checked the survival radio to make sure I was on the right channel. "MAYDAY-MAYDAY-MAYDAY." Still no reply. I could still hear that damn beacon. Just then, I realized I had failed to turn off my parachute locator beacon. Would you believe . . . as I struggled to turn off the beeper, I dropped my radio over the side!! Now what? At this point, I felt like the dumbest fighter pilot in the world. Well, to make a long story short, I settled down and finally started to get my sierra together. I knew the rest of my flight would be looking for me and I had to help.

At this point, I really wished I'd brought my personal survival kit with me; it at least had a signal mirror. And, I vowed never to walk out of the PE shop without my survival vest. I can put up with a lot of minor or imagined cockpit discomfort in the future to preclude a situation like this ever happening to me again.

Suddenly, there they were! One high and one low with the latter coming right at me. The beeper, which I never did get turned off, must have worked. I won't tell you I stood up in the raft yelling and waving my arms and fell out; the yelling did me a lot of good although no one heard it. Within minutes, I could see the rescue helicopter coming toward me. What a sight to see! Thirty minutes later, I found myself in a warm bed at the hospital.

The problems encountered in this story are very real. Over the years, documentation shows that our crewmembers are having a bunch of problems when placed in a water survival situation. As you can see, our WGFP (World's Greatest Fighter Pilot) encountered numerous problems and performed many tasks incorrectly. Some of those problems/mistakes were serious enough to possibly cost him his life. We often hear about individuals surviving on the open seas for months. I can assure you these individuals didn't survive totally by chance or luck. They knew the DOs and DON'Ts of water survival. Let's address some



well-known facts about water survival, facts that may very well save your life.

- There were a total of 71 USAF ejections in 1982; 63 of these survived for an 89 percent success rate. Six of the 71 were overwater ejections.
- You should review your overwater emergency procedures on a continuing basis.
- Individuals who are in good physical and mental condition stand a much better chance of successfully surviving an extended water survival episode.
- Crew members should fully understand the importance of having personal survival kits and always carry them when flying.
- Cockpit preparation and good body position are the keys to a successful ejection.
- The parachute descent checklist is provided as a guide. It may be accomplished in different sequences depending on the circumstances surrounding a particular ejection. You must exercise your own judgment in determining which steps are more critical to enhance your chances for survival.
- Activation of the life preserver is one of the most crucial steps of the parachute descent checklist for low altitude ejections over water.
- Severe oscillation could cause injury if not corrected prior to water contact.
- Use the time while descending under the parachute to scan the horizon for land or vessels which may aid in your recovery.
- It is much easier to travel towards a land mass or vessel while suspended under the parachute then traveling once in the water.
- You should activate both canopy releases immediately upon water entry. Parachutes with cross-connector straps tend to stay inflated if only one side is released.
- In recent years, the Air Force has lost at least one crew member to drowning each year. Being dragged by the parachute could be the most serious situation you will be forced to deal with. A major problem is getting your hands on the releases to activate them. It doesn't matter if they are KOCH, FROST, or CAPEWELL releases; the water force from being dragged will severely limit your ability to reach the releases. Good body position will aid you tremendously when trying to separate.
- If your parachute is equipped with the J-1 releases, make sure they are closed and remove all sharp objects from your pockets prior to boarding the raft.
- Secure all equipment to your body or the raft.
- Ensure the locator beacon is turned off prior to transmitting on your survival radio.
- Your chance of being attacked by hazardous marine life is extremely low as long as you remain in your raft.
- Many crew members have been injured during the recovery phase. You must communicate with the rescue force by any means available. Assist in your own recovery by doing only what you are told to do.

A special note to our crew members who are still convinced it couldn't happen to them. Chances are it won't happen to you, but what if it does? Will you be able to survive, or will you become another statistic? Individuals who have survived water episodes all seem to have one thing in common — *knowledge!* — Knowledge of their weapons system, to include the survival-related equipment and procedures. You must have faith in the equipment plus training in established procedures to combat the elements of a harsh environment. *Per scientiam vincimus* (Through Knowledge We Conquer) is the motto of the United States Air Force Water Survival School. Through knowledge, you can conquer also. ■

Safety Lessons Learned

■ "(Censored!) Those dummies did it again! They keep making the same old mistakes. Will they ever learn how to produce a safe airplane?" Does this sound remotely familiar? The statement contains signs of frustration and perhaps anger. All of us at one time or another have experienced or observed a recurring safety problem, maybe had a solution, but felt helpless to do anything about it. Well, the Air Force does have a program to solve this dilemma. Unfortunately, I have found very few people who know about it. In this article, I will explain the program and, hopefully, leave you with the challenge to contribute to it and motivate its implementation.

AFR 800-13, "Air Force Feedback Policy," assigns responsibilities to help apply engineering and management experience for developing and improving systems and to avoid repeating past mistakes. It is directed to all organizations that acquire, operate, and support Air Force systems, subsystems, equipment, and munitions acquired under the 800 series of Air Force regulations. The program is multifaceted, but I believe one aspect is of definite practical value to us. That aspect is the program to feed back lessons learned information from those who have experience to those who need it. A lesson learned is simply a recorded experience of value to the conduct of current and future programs. The recorded experience can be a success, an innovative technique, or a deficiency.

Within the Air Force, the Directorate for Lessons Learned at the Air Force Acquisition Logistics Center (AFALC/PTL, Wright-Patterson AFB OH 45433, AUTOVON 785-6011/6067/3885) is the central organization responsible for gathering, researching, storing, and distributing lessons learned. They focus on those technical and management functions which affect acquisition and logistics. Currently, lessons learned are categorized into 35 different elements of which safety is one. Many of the other elements have direct relationship to safety as well; tech orders, training, human factors, and operational requirements to name a few. Table I contains a listing of all the elements.

Several individuals play key roles in the lessons learned program. They are the lessons learned project officers, the users, and the people with lessons learned experience. The program is effective only to the extent that all contribute.

The lessons learned project

TABLE I

TECHNICAL ELEMENTS

01 Computer Resources (Support)	11 Reliability	30 Configuration Manage
02 Energy Management	12 Reliability and Maintainability	31 Contract Administrati
03 Engineering Data (Technical Data)	13 Safety	32 Contracting
04 Facilities	14 Supply Support	33 Data Management
05 Funding (Logistics Support Resource Funds)	15 Support Equipment	34 Engineering
06 Logistics Management Information Support	16 Survivability	35 Foreign Military Sales
07 Maintainability	17 Tech Orders (Technical Data)	36 Human Factors Engir
08 Maintenance Concept (Planning)	18 Test and Evaluation	37 Life Cycle Cost
09 Modification Planning	19 Transportation, Packaging, and Handling	
10 Manpower Requirements and Personnel	20 Training and Training Support	

LT COL ROBERT I. DAVIS
Directorate of Aerospace Safety

officers are located at AFALC/PTL. Their function is to thoroughly investigate potential lessons and to document the results. Whenever they uncover or are advised of a potential lesson, they conduct any required research, make necessary field trips, and assemble a complete file on that lesson. Then, they prepare the specific lesson learned. After its approval, the specific lesson learned becomes part of a central data bank for subsequent access.

The users group is divided into mandatory and nonmandatory users. Mandatory users are the managers of system acquisition and modification programs. Their interface to the program is through a lessons learned manager designated for each program office and through the Deputy Program Managers for Logistics and Integrated Logistics Support Managers. Non-mandatory users are all others with a need for lessons learned information. All can obtain the desired information in the form of an abstract, bulletins, and tailored packages. This is done by directly contacting AFALC/PTL by telephone, letter, message or in person. The abstract provides users with brief summaries of all lessons contained in the data bank. The bulletins contain collections of full lessons in specific areas such as safety. Tailored packages are those which are assembled and structured for unique purposes.

The remaining key group is all of you with lessons learned experience. This includes anyone in operational, maintenance, or support roles. You are the drivers of the program. You and I are the ones responsible for inputting significant and valid lessons with sufficient backup information for the project officers to be able to do their job. We are also the ones who must insist that the lessons are used. Our input is direct to AFALC/PTL. Table II is a suggested format outline for this purpose.

Now that I have explained the lessons learned program, I would like to focus on the involvement of our safety community. Daily, you and I are exposed to a wealth of information and experience applicable to safety lessons learned. Unfortunately, very little of it is now being fed back to affect new acquisitions and modifications. To input lessons to the program is simple with no bureaucratic red tape. Likewise, to obtain information from the program is easy. The mechanism is in being. Let's make it work! Perhaps one day we can say, "We're finally learning from our old mistakes." ■

GEMENT ELEMENTS

38 Manufacturing

39 Operational Requirements

40 Program Control

41 Quality Assurance

42 Source Selection

43 Program Management

Responsibility Transfer

44 Logistics Support Analysis

TABLE II

INPUT FORMAT FOR POTENTIAL LESSONS LEARNED

Potential Lesson Learned Date:

1. Subject:

2. References (reference any reports, correspondence, knowledgeable persons, and other sources of information):

3. Description of the situation and background information:

4. Describe the course of action, if any, that corrected the situation:

5. Briefly state what you believe the lesson learned is:

Submitted by (name, organization and office symbol, AUTOVON).

When The Airplane Breaks

MAJOR JOHN E. RICHARDSON
Editor

■ Every year, "logistics type" mishaps contribute to the total USAF mishap experience. The logistics community is working the material problems hard, and there is steady improvement. But there is one area of log-related mishaps over which they have little control. This is that group in which a pilot either continues a mission with a known malfunction or fails to cope with the emergency in the air. These failures on the part of pilots are usually the result of overmotivation, lack of knowledge, or lack of training — all things which we, as aircrews, can overcome. Here are some examples of what I mean.

■ A fighter interceptor was on a night intercept training mission. The first two intercepts went as planned. During initial maneuvering for the third intercept, the pilot of the mishap aircraft radioed that he was out of control. The WSO ejected at about 6,000' AGL. The pilot did not eject. Later inteviews with the WSO indicated that the attitude indicators had malfunctioned, but the pilot elected to continue with the mission. On the third intercept in IMC the pilot was unable to maintain control of the aircraft.

■ A bomber had experienced several instances of engine torching on start, at least one of which resulted in an overtemperature. The overtemp was not written up by the pilot. On a subsequent sortie, the

In spite of the best design, assembly and maintenance, airplanes will occasionally break. What follows that event is a true test of a flight crew's preparation and professionalism.

aircrew experienced torching on the engine and two overtemps which the pilot did not have investigated by maintenance. The engine turbine had been severely damaged by the overtemps. During flight, one of the blades failed. This caused extensive damage to the two adjacent engines as well as extreme vibration. The vibration caused the engine mounts on one engine to fail and resulted in actual loss of the engine from the aircraft.

■ The pilot of a fighter preparing for takeoff noticed the APU light was on. This meant that the APU was running, but the pilot believed this indicated that the APU was inoperative. He proceeded with the mission — allowing the APU to continue to run. The resistance of hydraulic pressure on the APU in flight caused it to overheat. This overheating destroyed seals and allowed hydraulic fluid to leak and catch fire. The fire destroyed wiring and hydraulic lines in the area. The crew first noticed some electrical problems, then progressive failures in all three hydraulic systems. Once aircraft control was lost from the hydraulic failures, the crew had no choice but to eject.

While in some of the above cases the malfunctions were apparent before the aircraft got airborne, this is not usually the case. More often, something breaks in the air and the aircrew has to cope. Sometimes, there is nothing the crew can do to salvage the situation. Then the only alternative is to jettison the aircraft. But in some cases like the ones below, the aircrew turns an almost routine emergency into a Class A mishap.

■ An IP and student were performing aerobatics in a fighter type aircraft. During an energy-gaining maneuver the right engine flamed out probably because of previous right boost pump failure. The IP pulled the left throttle to idle and, because of the nose high, low airspeed condition, the left engine rpm decayed to below generator cut out speed. The IP failed to refer to the checklist, analyze the emergency, or take proper corrective action. He held the aircraft in a nose high, low speed, high sink rate condition outside the airstart envelope thereby negating all start attempts. He finally directed ejection which was accomplished successfully. After the crew ejected, the aircraft pitched down and gained airspeed, both engines accelerated, and the aircraft struck the ground at high speed and was destroyed.

■ In another fighter mishap, Number 2 in a three-ship night formation mission veered left on

continued

It's bad enough when your gear fails to extend, but when you're not even aware of it on final — you're in serious trouble. A pilot who's *really* in control of the aircraft and who's current in Dash 1 procedures has the best chance of coping successfully with this emergency.

When The Airplane Breaks continued

take off as a result of a nose wheel steering malfunction. The pilot failed to follow proper abort procedures, and the aircraft departed the runway in full afterburner. After runway departure, the main gear collapsed and the external wing tanks ruptured causing a major fire.

■ A bomber crew was responding to an exercise. During the engine start a fire erupted in the area of engine number 5. The copilot followed incorrect emergency shutdown procedures by removing essential electrical power from the aircraft before ensuring that the fuel shutoff valves had closed. As a result, fuel continued to feed the fire until firefighters were able to enter the cockpit, turn on the battery, and close the fuel shutoff switches.

Sometimes it's not just the aircrew who fail to cope.

■ A fighter returning from a mission turned final for landing. The pilot was unaware that the left gear had failed to extend. The gear unsafe warning light (red light in the gear handle) did not work because of a relay malfunction. However, the pilot did not check the green gear down lights (the left one was out), and continued the approach. The RSU controller was busy and did not check the aircraft configuration until too late to prevent a touchdown with the gear up.

■ A fighter bomber was returning to base after a mission. On landing, the left wheel and axle separated at a pre-existing stress crack. The crew made a go-around, and supervisors decided to foam the runway for recovery by an approach end engagement. The foam was to be started just short of the BAK-12 cable but was actually started 1,500 feet before that point. The aircrew was not informed of this error. The aircraft commander landed just short of the foam which was, unknown to him, 1,700 feet before the cable. Believing the arrestment unsuccessful, the AC selected AB for a go-around. Just as the aircraft broke ground the tail hook engaged the cable, and the aircraft was slammed back onto the runway. The aircrew egressed successfully.

None of the mishaps discussed here need have happened. While it is true that they are all classified as logistics mishaps due to some material failure, a key contributor was some operations failure — either aircrew or supervisory. The three steps for coping with an emergency are listed in every Dash 1, and every pilot learns them by rote in UPT. It is unfortunate that some forget them later on. So as a reminder:

In An Emergency

1. Maintain aircraft control
2. Analyze the situation and take proper action
3. Land when conditions permit

Let's not add to our problems. Knowing the aircraft and the procedures can make the difference in your ability to cope with an airborne problem. ■

OPS TOPICS

Wind Shear Alert Systems for 51 Additional Airports

■ The Federal Aviation Administration has ordered 51 additional wind shear alert systems for installation at airports across the nation, bringing to 110 the number of airports which will have the equipment.

Wind shear has been blamed in a number of air carrier accidents in recent years. The phenomenon generally is associated with thunderstorms or fast-moving weather fronts that generate sudden changes — or ''shears'' — in wind speed or direction. Because these shears usually occur within 500 feet of the ground, often reaching speeds of 50 knots, they can present a serious hazard to aircraft during take off and landing.

The wind shear alert system uses a mini-computer to monitor wind speed and direction from five sensors located around the airport perimeter, then compares them with the readings from another sensor located near the center of the airport operational area. When a significant change is noted, audible and visual alarms are triggered in the airport control tower. Controllers can then alert pilots to the problem.

The 51 airports scheduled to receive wind shear alert systems are: Alabama: Huntsville, Montgomery, Arizona: Tucson, Arkansas: Fort Smith, California: San Francisco, Colorado: Colorado Springs, Connecticut: Windsor Locks, Florida: Daytona Beach, Fort Myers, Tallahassee, Pensacola, Georgia: Augusta, Columbus, Savannah, Hawaii: Honolulu Oahu, Illinois: Moline, Peoria, Springfield, Iowa: Cedars Rapids, Sioux City, Kentucky: Lexington, Louisiana: Baton Rouge, Monroe, Shreveport, Michigan: Grand Rapids, Lansing, Minnesota: Rochester, Missouri: Springfield, Montana: Billings, Nebraska: Lincoln, New York: Albany, Syracuse, North Carolina: Asheville, Fayetteville, Greensboro, Ohio: Toledo, South Carolina: Charleston, Columbia, Greer, South Dakota: Sioux Falls, Tennessee: Bristol, Chattanooga, Texas: Austin, Dallas-Love Field, El Paso, Lubbock, Midland, Virginia: Charleston, Wisconsin: Green Bay, Madison.

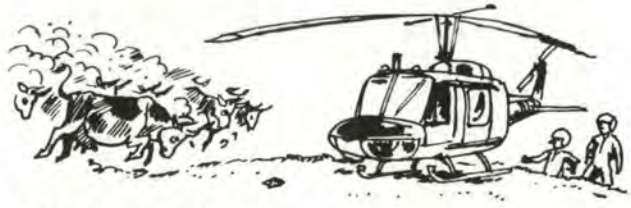
Don't Be Too Crabby

An Aero Club pilot in a Seneca was making an approach to an uncontrolled airport. The winds were at the maximum cross wind component for the aircraft. The airport geography is such that, at a dip in the first 1,500 feet of the runway, wind shear and gusts are very likely.

As the pilot touched down in the center of this dip a sudden gust hit the aircraft and the aircraft crabbed about 30 degrees into the wind. The pilot immediately initiated a go-around and became airborne. He then realized that enough runway remained to make a safe landing, which he did.

After landing, the pilot discovered that the right prop had struck the runway damaging the blades, hub, and attaching mechanism.

Later, the pilot stated that he had had enough fuel to go to another airport and, in retrospect, once he knew that the winds were right at the limits, he probably should have diverted.



An Udder Incident

The following is an extract from an incident report submitted by the captain of a helicopter. ''On approaching the aircraft 10 to 12 cows were seen to be buffeting against it. The ground crewman was immediately sent to clear the area; the sortie was delayed for an assessment of the damage.'' The damage assessment read as follows: ''Aircraft attacked by cows. Both lower homing aerials broken off, slight denting to tail boom, negligible damage.'' — Courtesy *Air Clues*, Aug 83.

OPS

Loose Tail

When an F-111 aircrew moved the horizontal stabilator during preflight, it moved 4 or 5 inches. This is five times the normal movement.

Maintenance checked and found that the forward servoactuator pin was disconnected. With this pin disconnected, the tail servoactuator is disconnected from the airframe and control of the horizontal stabilator is impossible. That's why we preflight aircraft.

Light FOD

As the C-141 rolled out after landing, the crew heard a loud thump under the belly. After parking, the crew found damage to the aft nose gear door, the belly, and the left inboard flap. The investigator discovered that the damage was caused by a runway centerline light. Evidently as the nose gear ran over the light, the light was flipped out of its anchor can and struck the aircraft.

The investigator looked into how the light could have come loose. On this runway the centerline lights were installed after the runway was built. So installation required that a hole be dug into the asphalt and the anchor can secured with epoxy glue. Over the years since installation, the epoxy cracked which allowed water to seep in between the glue and the steel anchor can, breaking the bond.

The loose anchor subjected the light to additional vibration and eventually caused the retaining bolts to loosen and fail allowing the light to slip out of the anchor when the C-141 nose gear struck it. The investigator suggested that the bolts specified may be too short and that a longer bolt should be considered to prevent them from coming loose.

"But I Thought . . . "

A T-41 pilot called for landing instructions at a large and busy western base. The Tower controller told the T-41 pilot to report left base for the left runway to follow two A-10s on radar final to the same runway. The pilot acknowledged the landing instructions, but by his own testimony, later did not understand that he was to follow the A-10s.

The Tower, believing that the T-41 would follow the landing sequence, did not include that sequence in any subsequent transmission. The T-41 was not called as traffic to the A-10s through RAPCON because Tower believed that the T-41 pilot had the A-10s in sight and would land behind them.

When the T-41 called on an extended left base, the Tower granted landing clearance without mentioning the A-10s. The T-41 pilot saw the A-10s but thought that they would be landing on the right runway, so he continued his turn and rolled out in front of them at about one mile. The A-10s took evasive action and went around, without incident.

Although the Tower controller acted in accordance with his directives, the investigator suggested that had the controller advised the T-41 of the proper landing sequence more than on the initial call, the conflict might have been avoided.

TOPICS

Ah-Hem

Apparently, a commercial airline has recently been fitting autoland to its aircraft and the various stages of fit have caused some problems. The technical log entry from a pilot off a recent sortie reads: "Autoland carried out. The aircraft landed very firmly and well to the left of center line. Most unsatisfactory."

The engineer's entry simply reads: "Autoland not fitted to this aircraft." — Adapted from *Air Clues*, Aug. 83.

Big Wind

The crew of a C-130 were performing an engine runup check prior to an FCF. The runup was being performed in a position directed by airport ground control. The positioning of the aircraft directed prop blast down a taxiway.

As they were completing their runup, the C-130 crew were asked to go to ground idle to allow a light aircraft to taxi behind them. The crew complied thinking that the light aircraft would be using a portion of the ramp some 800 feet behind the 130. In fact, the light aircraft was taxiing on a snow-covered taxiway about 200 feet behind the 130.

The pilot of the light aircraft stated that as he attempted to pass behind the C-130 his aircraft weathervaned into the propeller blast. The pilot was unable to complete the turn onto the taxiway so he stopped. At this point, the Cessna 150 lifted into the air, fell off on its nose and right wing and came to rest upside down — 250 feet behind the C-130.

The Cessna pilot exited the aircraft unhurt. Subsequent tests showed that wind speeds of 40 knots can exist as much as 250 feet behind a C-130 with engines running at idle.

AF Evaluates On-Board Oxygen System for Fighter Aircraft

The Air Force is evaluating an on-board oxygen generation system (OBOGS) to replace the liquid oxygen converter system now in use to produce breathing oxygen for fighter crews.

In a program managed by the Aerospace Medical Division at Brooks AFB, Texas, the on-board system is undergoing tests aboard an F-16 Falcon fighter. If implemented on operational aircraft, OBOGS would lessen crew dependency on bottled liquid oxygen.

OBOGS uses "bleed" air from the aircraft engine to generate oxygen for the crew. The air goes through a pressure regulator and then through one of two cylinders, or "beds" containing a material called zeolite (a hydrous aluminum silicate mineral). The zeolite effectively delays nitrogen long enough for oxygen to move through the bed. Part of the oxygen goes through an oxygen-level monitor to the crew while the other part goes to the other bed to back-flush out the nitrogen and other contaminants from previous operation.

A rotary control valve alternates the air flow through one bed and then the other to ensure adequate oxygen for the crew.

An Air Force decision is due early in 1984 on installation in F-16 C and D models.

Eyeglass Frames

Some aircrew flight spectacle frames manufactured by "Norton" have experienced a high failure rate. In some cases lenses have fallen out in flight. The defective frames are aluminum (silver) colored with "Norton" stamped on the inside of the temple portion of the frame. If you have a pair of glasses of this description take them to your base eye clinic for evaluation or replacement. Glasses stamped 'AO American Optical" are safe for flight and do not require evaluation — Adapted from ALSAFECOM 005/83 ■

ULTRALIGHT FLIGHT INSTRUCTION

Photo By Ted Kost

■ In the interest of fostering flight training and air safety, FAA has issued exemptions to three ultralight organizations which will allow two-place ultralights to be operated under Part 103 for the purpose of giving instruction only, under certain specified restrictions.

FAA inspectors are aware of the concern expressed by some aircraft pilots about sharing airport traffic patterns and other airspace with ultralight vehicles flown by uncertificated persons. Thus far there are no reports of ultralight/aircraft midair collisions, but there have been near misses reported before the adoption of Part 103.

Under the exemptions, instruction in powered two-place ultralights may be given only by a person authorized by the Ultralight Division of either the AOPA Air Safety Foundation or the Experimental Aircraft Association (EAA), in vehicles weighing no more than 350 pounds, with a power-off stall speed no higher than 29 knots. No other limitations of Part 103 are exempted.

Anyone operating a two-place ultralight under Part 103 without an authorization as provided in these exemptions faces fines of up to $1,000 for each section of the regulation violated per flight.

A powered two-place trainer operated under the exemptions must be placarded, ''To be used for instruction only,'' and one of the two occupants must be a person authorized by ASF or EAA (whichever is appropriate) to provide flight training under these exemptions. This person will be a certified flight instructor or a person recognized as an ultralight instructor.

All flights must be limited to flight training. Some solo ferry

As with all 2-place ultralights, this Eipper Quicksilver can only be flown as an instructional tool. Among the new FAA restrictions is the requirement that all instructors be authorized by the Ultralight Division of the AOPA Air Safety Foundation or the Experimental Aircraft Association.

Photo By Norm Petersen

Photo By Gene Chase

So you want to soar like an eagle but the winter chill is cooling your enthusiasm. How about this two-seat Tierra (Motorized Gliders of Iowa) with enclosed cabin, padded seats and storage compartment? Even if it doesn't meet FAA aircraft standards, ultralight fliers are probably more than pleased.

Photos courtesy EAA Ultralight Association and *Sport Aviation*.

flights by the person holding an authorization are permitted. A student must be informed that his flight is being conducted under an exemption and that the vehicle does not meet FAA aircraft certification standards.

Each person allowed to give instruction under the exemptions must be issued a numbered individual authorization and a copy of the exemption, with which he or she must be familiar and which must be presented to FAA for inspection upon request.

A separate exemption was issued to the U.S. Hang Glider Association containing similar provisions covering unpowered, two-place vehicles operated for the purpose of giving instruction from launch sites approved by USHGA.

Individuals wishing to give or take instruction under the exemptions granted these organizations should write for details to:

- AOPA Air Safety Foundation
  Ultralight Division
  421 Aviation Way
  Frederick, MD 21701
- EAA Ultralight Association
  P.O. Box 229
  Hales Corners, WI 53130
- USHGA
  P.O. Box 66306
  Los Angeles, CA 90066

Each organization may have its own additional requirements that applicants will have to meet before authorization to give or receive instruction is granted.

Questions and Answers

Q: What about the N-numbers and airworthiness certificate of a two-place ultralight operated as a trainer under Part 103?

A: The N-numbers may be left on, but the airworthiness certificate must be turned in to FAA.

Q: What exactly constitutes a two-place ultralight?

A: Any ultralight with two separate seats constitutes a two-placer. However, an ultralight with any seat that *could accommodate two persons* also may be considered "two-place."

Q: What protection is given to the public by these exemptions?

A: The student must be told that the flight is being conducted under an exemption in an uncertified vehicle. The students is advised of and accepts a risk that a member of the general public need not be exposed to.

Q: After completing a flight training course in a two-place ultralight with an authorized instructor, can the student then solo the two-place ultralight?

A: No, at this point in the training the student would be transitioned to a single-place ultralight.

Q: Will a two-place ultralight operated for training be allowed a greater fuel capacity?

A: Negative. All other provisions of Part 103 must be met.

Q: Does a person have to be a member of any of those exemption holding organizations to get an authorization as instructor, or to take instruction?

A: A person wishing to obtain an instruction authorization will have to meet not only the requirements of the exemption but also all additional requirements of the exemption holder, which may include membership. The latter may also establish certain requirements for trainees.

Q: Does the person authorized to conduct flight training in a two-place ultralight have to keep that authorization on his person while giving instruction?

A: Affirmative. It must be shown to any FAA inspector on request.

Q: Are these exemptions a foreshadowing of numerous exceptions to Part 103 to come?

A: No. Exemptions to Part 103 are expected to be few and far between. Since adequate training has been difficult for a student aloft with an instructor in the ground, the two-place exemption was seen as a means to reduce the accident rate in ultralight operations and improve safety in the air for all. ■

— Courtesy FAA *General Aviation News*/July-August 1983.

OFF THE WALL

Selected thoughts found on the AFISC walls. These thoughts cannot be taught. They are written in the hearts of people. They can only be shared.

Press On

Nothing in the world can take the place of persistence. Talent will not; nothing is more common than unsuccessful men with talent. Genius will not; unrewarded genius is almost a proverb. Education alone will not; the world is full of educated derelicts. Persistence and Determination alone are Omnipotent.

MAIL CALL

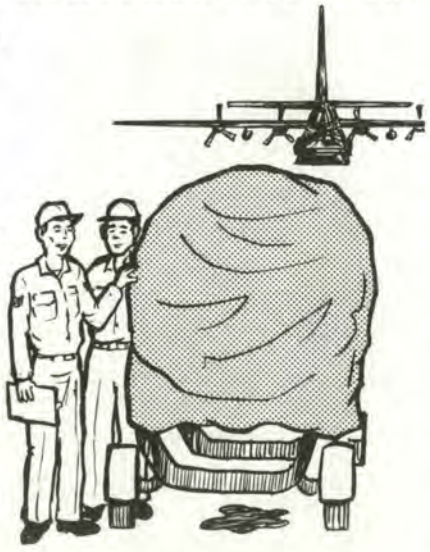
EDITOR:
FLYING SAFETY MAGAZINE
AFISC (SEDF)
NORTON AFB, CA. 92409

Cargo Leaks

I am very concerned about a serious problem for those of us involved in airlift. All too often the people preparing motor vehicles, engines, and other potentially hazardous materials do not comply with the regulations. Here is an example.

In support of Maple Flag exercise a C-130A crew was requested to air transport one RF-4 J79 engine from a foreign base to the CONUS. The engine was loaded on board and properly secured to floor cargo tie downs. Shortly afterward, jet fuel was observed dripping onto the cargo floor. Efforts to contain the fuel seepage were unsuccessful, therefore the engine was unloaded and returned to ground loading personnel. It was agreed that this engine was not properly processed for air shipment and that it would not be reloaded until the provisions of AFR 71-4 were complied with.

Just prior to engine start for return to the CONUS, the ground loading supervisor and his crew appeared with the engine to be reloaded. They assured the aircrew that all fuel in the engine fuel system had been purged, all residual fuel in the engine fuel components had been eliminated and this time the engine was prepared for air transportation as evidenced by documents presented to the aircraft loadmaster. One more time the engine was loaded and secured.



Approximately one hour into the flight, the crew began to notice jet fuel fumes. Fuel was observed dripping onto the floor from the jet engine that had been a problem before. The crew used the hazardous cargo kit to contain the fuel leakage, and smoke and fumes elimination procedures were accomplished. The aircraft landed uneventfully at a stateside military base, and the culprit engine was unloaded under the watchful eyes of the entire air base fire department.

Several observations can be made from this near tragic incident:

- Published directives procedures were not followed in preparing the engine for air shipment.
- Aircrew was persuaded to accept the air cargo the second time it was brought back, even though some doubt existed as to the procedures used to purge the fuel system.
- There was no immediate or urgent action at the time of this incident requiring the air shipment of the engine in the condition it was delivered to the aircraft.
- Documents accompanying the engine were not properly prepared.
- It is better to refuse cargo for air shipment if any doubt exists as to the proper preparation than to wait until it is too late.
- One spark could have prevented me from writing this letter.

Thank you for giving me the opportunity to express my concern and that of all airlifters about improperly prepared cargo.

JOSE A. ALBERIO, MSgt, USAFRES
C-130 Flight Engineer
96 TAS, Mpls-St Paul IAP, MN

You are right. Improper cargo preparation is a recurring problem and has been a hazard in the past. Anyone preparing cargo for air shipment by Air Force aircraft must comply with AFR 71-4. Unfortunately, this is not always the case. Most fuel leaks and hazardous cargo incidents are the result of improper preparation.

We at AFISC are concerned about the problem and are exploring possible solutions. But, in the interim, the best protection an aircrew has is vigilance and preparation. If, when you inspect the cargo, there is any doubt about its preparation, check it out thoroughly.

Weather Briefings

In the Ops Topic "Changes In Procedures for Weather Briefings" in the October 1983 issue you said pilots could get three kinds of weather briefings. When I went to my base weather shop they didn't know what I was talking about. What's going on?

Perplexed Pilot

Your weather people were surprised at your request because these new procedures apply only to civilian aviation weather briefings and Flight Service Stations. You will still get personalized service from your military weather briefer, but it will be in the traditional form tailored to your mission as you have always received. If you fly from a civil airport without military weather support, or call a Flight Service Station, you can expect to see the new briefings.

Do You Have A Story To Tell?

■ One of the ways we learn about flying safety is through the experiences of others. This is the purpose of the There I Was program. We ask you to tell us your experiences, those things which got your attention and taught you about flying.

A There I Was should be anonymous. We aren't interested in who you are. We are interested in what you have to say. We particularly want to hear those stories where the pilot did (or didn't) do something that set the situation up. Maybe by telling the story we can keep someone else from making the same mistake.

One caution — There I Was is not a replacement for the hazard or mishap reporting systems or a way to air your complaints. We are trying to share flying experiences and help improve flying safety.

So if you have a story (and what pilot doesn't have at least one), take a minute and jot it down on the form on the next page, then cut that page out and send it to the address on the back. ■

THERE I WAS...

Fold

AFISC/SE
NORTON AFB, CA 92409

HQ AFISC/SE
"THERE I WAS"
NORTON AFB, CA 92409

"EYES ONLY" for the DIRECTOR

Fold

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ITED STATES AIR FORCE

Well Done Award

Presented for

outstanding airmanship

and professional

performance during

a hazardous situation

and for a

significant contribution

to the

United States Air Force

Accident Prevention

Program.

CAPTAIN

Charles M. Campbell

401st Tactical Fighter Wing

■ On 17 January 1983, eleven F-4D aircraft were launched on missions with Captain Campbell as supervisor of flying. Weather was forecast to be VFR with 3,500 feet overcast, 6 NM visibility, and rain showers in the vicinity. Approximately 1 hour after the first flight departed, Captain Campbell noted decreasing ceiling and visibility, heavy rain in the vicinity, and increasing crosswinds. He initiated a weather recall and requested the Command Post verify that the designated alternate airfield was still VFR and available as reported earlier. The designated alternate's status was not confirmed until 10 minutes later when an airborne aircraft relayed that the runway was closed due to ice and snow. Captain Campbell immediately called the eleven airborne aircraft to a common approach frequency, informed them of the deteriorating weather, lack of alternates, and established landing priorities based on aircraft fuel and location. He then instructed Tower and GCA personnel of the landing priorities, and the first four aircraft landed uneventfully. The weather, however, continued to deteriorate with driving rain and increased crosswinds. The fifth aircraft was unable to stop on the wet runway and engaged the departure end arrestment cable. Captain Campbell immediately informed the remaining six Phantoms of the aircraft in the barrier and supervised an expeditious reconfiguration by the barrier maintenance crew at the departure end of Runway 23. The next aircraft landed and experienced severe weather vaning, requiring the pilot to jettison his drag chute and engage the departure end arrestment cable. Another rapid reconfiguration of the barrier followed. Further weather deterioration contributed to one of the remaining aircraft performing a missed approach from a PAR due to a lack of visual references at decision height. With the ceiling now at approximately 500 feet, in-flight visibility less than a mile, fuel a major factor, and no alternate available, the situation was critical. Although forecast winds had favored Runway 23, Captain Campbell directed the Tower to change to Runway 05 which had better approach lighting and a greater variety of instrument approaches. During the subsequent recoveries, Captain Campbell continued to provide invaluable assistance to the approach controllers as they sequenced aircraft for their approaches. He also directed barrier maintenance to proceed to the departure end of Runway 05, and three more Phantoms landed without mishap. The tenth aircraft landed with a drag chute malfunction. Captain Campbell directed a barrier engagement over UHF (Guard), and the aircraft engaged the departure end arrestment cable. After another expeditious barrier reconfiguration, Captain Campbell instructed the last aircraft to take the approach end barrier to minimize potential roll out problems due to driving rain, extensive standing water on the runway, and high crosswinds. The total time elapsed from Captain Campbell's initiation of the weather recall to the landing of the eleventh aircraft (fourth cable engagement) was only 1 hour and 5 minutes. Captain Campbell's decisive actions, coordination, and accurate decisions resulted in the safe recovery of eleven aircraft. WELL DONE!■

When The Airplane Breaks

ARE YOU PREPARED?

See The Dash 1 For Details