

FLYING **SAFETY**

Our **50**th Year

F-16 LOGISTICS MISHAP SUMMARIES

YOUR WINGMAN IS YOUR COPILOT

FIGHTER SUMMARIES

JANUARY 1994

FIGHTERS





THERE I WAS

An "oldie but goodie," this article was written back in the old SAC days when graduating Castle crews "soloed." We think the message still applies to today's crews. — Ed

■ After completing their KC-135A check ride at Castle AFB, my student crew was scheduled for their solo flight before departing for their assigned units. Since it was a two-copilot crew and I was their instructor, it became my duty to fill the aircraft commander's seat on the solo flight. Everything went as planned up to the air refueling rendezvous. Then things started to happen.

The air refueling base altitude was FL 240. As we started a turn to our receiver's inbound track, the cabin pressure slowly started to rise to

18,000 feet. As soon as we noticed the increase, I said over the interphone, "Crew, we're losing cabin pressure; let's get on 100 percent oxygen."

By this time, I had rolled out in front of the receiver just as we got our quick-don masks on. We were below FL 250 with plenty of oxygen, so I planned on completing the air refueling unpressurized. The extra copilot was in the jump seat so I glanced at him to make sure he had his helmet and mask hooked up correctly. He was okay, but I noticed the new navigator still didn't have his helmet on and was concentrating on the scope.

I said, "Nav, you had better get on 100 percent oxygen," and he replied, while pointing at his regulator, "I

am on 100 percent oxygen." I proceeded to explain it wasn't going to do any good if his helmet and mask weren't on properly. When I quizzed the boom operator, the long delay before he responded told me he had made the same error. That is, he checked 100 percent on his regulator but he didn't put on his helmet.

It occurred to me pilots have numerous simulators to practice in for just such a situation, but what about navigator and boom students? Also, was my terminology perfectly clear? It was to me and my copilots, but it was a drill we'd practiced many times. Considering the nav and boom's experience level, I should have been more directive in my communication. The whole experience provided food for thought. ■

flying **SAFETY**

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A/OA-10

MAJ J. G. BEAUMONT
Action Officer/AFSA

■ Well, Hogmeisters, here's the latest and hottest Flight Safety news from Hogcorner, atop the Air Force Safety Agency (AFSA) tower. At the ebony keys is your new Hogporter, "JEAN-GUY."

I am joining you from the Northern Canadian Fighter Wilderness Sanctuary of Canadian Forces Base Cold Lake, Alberta, Canada. An air-to-mud operator for the majority of my flying career, I have an affinity for cordite smell and truly enjoy the Vegas-like effect of high explosive incendiary (HEI) rounds hitting the target. I am mercifully kind, but I have no sympathy for lesser flying species such as Eagles, Vipers, and those dreadful bugs, the Hornets. I'm your drafted Canuck Hogporter, eh! My American is not the best, eh! But I promise to be true to your cause!

FY93 Recap

In a near vintage year, the A-10 community met head-on the challenge of intensified night operations without any associated mishap. With continued and diligent efforts from all involved aircrew and support personnel, the very enviable A-10 past decade safety record was maintained at a close-to-status-quo rate of 1.76 per 100,000 flying hours for this past year, vice 1.79 for the previous one.

FY92 saw three A-10s destroyed as well as one fellow A-10 pilot killed. FY93 adds up to two A-10s destroyed and one dead pilot. In summary, you flew somewhat less hours with, at first glance, similar results. This can be deceptive and not truly representative of your FY93 achievements.

The first part of FY93 somewhat tarnished your overall yearly accomplishments. The remainder of the year, however, was marked by mishap-free mission accomplishment. You have reduced operator causal factors from three in FY92 to only one in '93. Compared to FY92 you experienced and reacted timely and effectively to a similar amount of airborne emergencies and recovered all involved jets safely.

You did this because you successfully carried out EMERGENCY checklist items while remembering not to let anything distract you from the priority task of keeping the "sick and lame" hog aloft. This is a 200 percent improvement on your FY92 performance. The bottom line — one more A-10 and one more A-10 pilot remain available on your fighting rosters. Add to this the associated satisfaction of knowing that a "Hogster" is alive and kicking, thus able to cherish his family and friends.

FY93 Hit Parade

Late WX Abort: A sad remake of a "well-known oldie." Here is the music sheet. Picture three little Hogs setting out for a simple get-to-know-the-country-sights sortie prior to a deployment exercise. This is new and unfamiliar mountainous territory for the section lead. The weather is European VFR at best. En route, following receipt of an in-flight WX PIREP, lead elects to get through VFR. They eventually penetrate a mountainous valley that proves to be the "Valley of Shadows and Death." The ground came up, or the cloud came down to a point where prevailing conditions were bad enough for the wingmen to ask lead to turn about and "get out of Dodge." During the WX abort maneuver, lead's aircraft impacted a sloping ridgeline. The aircraft was destroyed, and the pilot was killed on impact.

Let's not judge the players, but rather let's establish personal day-to-day ROEs that will keep us from reenacting this somber tragedy. Remember, Hogsters, this disease is without a doubt the NUMBER "1" aircrew killer worldwide, even atop our dreadful "old foe," the MIDAIR.

Bad Pig Booster

Well, there he was in the rocket pattern doing what Hogs do best, getting down and dirty. This heavenly occupation came to an undesired conclusion when suddenly the right-hand engine catastrophically failed. Pieces fell from the injured jet, and a smoke trail highlighted its flightpath. A few seconds later, the flight controls jammed. The pilot as-

sessed this time-critical situation and rightly decided to jettison the airframe. He ejected successfully and lived to tell his story. Shortly thereafter, the aircraft was destroyed on impact.

We were fortunate this occurred where it did. Had the engine failed in the final stage of a low-angle weapons delivery, while the jet was at, or close to, minimum release parameters, things could have been much worse. We knew prior to this mishap the design of the TF-34 engine low-pressure turbine (LPT)

nozzle seal retaining system was defective and required installation of new LPT nozzle seal pins. Procedures outlined in TCTOs 2J-TF34-608/608C were already being performed during jet engine intermediate maintenance (JEIM) and depot level maintenance to replace LPT nozzle seal pins on a routine maintenance basis.

This particular engine had not undergone the above-mentioned inspection and repair since it had not been subject to either JEIM or depot maintenance since the TCTOs were

continued





A/OA-10 continued

implemented. On the mission prior to this mishap, an "RA-37" turbine engine monitoring system (TEMS) reading was downloaded but not thoroughly pursued. In short, Hogmeisters, this Hog could have lived. We had the technology and knowledge to save it. It is too late for this particular jet. Let's concentrate on preventing a similar gloomy fate to others.

NOTE: There were 1,455 TF-34 engines afflicted by inadequate LPT nozzle pins, and they were required to undergo procedures outlined in TCTOs 2J-TF34-608/608C. As of 29 October 1993, 960 TF-34 engines had undergone this procedure with 495 more engines remaining. Planned

completion for the above TCTOs' modification is 1 January 1995. As an interim safety measure, a special inspection has been added to TO 1A-10A-6S-7, page 2-A-006, requiring inspection of the LPT stator every 35 hours for missing Stage 6, Seal Retaining Pins on all field engines yet to undergo modification 2J-TF34-608C. Attempts to accelerate the modification process by SA-ALC have proven fruitless due to non-availability and slow production of required new replacement parts.

Heads up, you-all, eh! This puppy will be stalking us for a while longer. It will be ready to snap at us anytime, awaiting only a moment of inattention on your part. Please re-

tain this credo: ONLY HEALTHY SWINE TO THE AIR so that nobody whines about it!!

C Notes

FY93 "tunes" out to a total of 47 Class C mishaps. Engine flameouts, overheats, and oil discrepancies lead the pack with 24 occurrences. Ten loss-of-cabin-pressurization incidents were recorded. They occurred from 21K to 35K. Pressurization failures were attributed mostly to ECS system or canopy seal anomalies.

Six unsafe landing gear mishaps were reported this year. Damage to the undercarriage system from pieces of rubber separating from a main tire was the main contributing

factor.

Four bird-strike mishaps were also reported with no successful penetration of the titanium bathtub recorded. Many of those mishaps were recovered under single-engine profiles, some with accompanying degraded flight control system(s) and tasking night weather conditions. Nice job, Hogsters. Another feather for your fighting hats.

Remember that just a year prior, FY92, two jets departed controlled flight while the aircrew were handling IFEs, or in the process of recovering the jet to homeplate following initial emergency handling. You beat the odds in FY93. This calls for a command repeat performance in FY94.

New Hit Release FY94

We kicked your butt all year long, Murphy (a "Pigs unlimited" long-play flying achievement!!), recorded worldwide under a "GUNS Unlimited" label throughout FY94 and made possible through 12 months of utterly dedicated aviating efforts by global A-10 tamers, handlers, and supporters. Scheduled LP release is for early October 1994. It promises to be the pride of all involved performers, highly acclaimed by friends and somewhat less popular with foes.

This is the goal I wish so dearly you could attain. The path to one whole fiscal year worth of flying activities without a single Class A or B mishap will present numerous challenges to those of you who fly the mission and those who provide the all-encompassing support. Continued day and night flying operations in austere financial times and the unique challenge associated with operating aging equipment will duly test your mission accomplishment resolve. Remember to just be pig-headed about your goal. Constantly use proper planning and risk management and follow established procedures. Combine this with the determination and competency of your operations and support team and you will have it.

Signing off (QSY)

Need to hear from you so I can better serve you. Please write, FAX,

E-Mail, or phone your ideas, comments, and information request(s) to me. Reach me at Hogcorner using one of the following: AFSA/SEFF, 9700 Avenue G SE, Suite 273B, Kirtland AFB, New Mexico, 87117-

5670; or phone commercial (505) 846-0737, DSN 246-0737; FAX: DSN 246-2721 or 2710; E-Mail: Defense Data Network (DDN) (i.e., Internet) — address as follows: beaumontj%smtps@afsal.saia.af.mil. ■

The ROEs

Supervisors: Meticulously assess mission priority(ies) and the need to go against WX conditions, aircrew physiological and psychological status, aircrew proficiency, and real (not perceived) operational requirement(s). Will the cancellation or postponement of this mission allow the bad guys to come over the horizon and vaporize our world? If there is any doubt in your military mind about above-mentioned preflight conditions and answer to above question is capital "NO," keep the jets and crews on deck.

Section Lead: Ensure validity of above supervisor(s) assessment. Remember you are the last and most conversant supervisory link in the risk assessment chain. If there is any doubt in your mind, scrub or postpone missions and discuss it with your supervisor. Additionally, thoroughly cover in preflight briefings all ROEs, including minimum WX requirements. Tell your flight members you're only human, and humans make mistakes. Let them know you're a team, and inputs from all are expected and required. Knock-it-off calls are a must anytime a question mark pops into their mind regarding situational awareness or safe mission accomplishment, no matter how good they think you are. Never frown or ridicule such a call — don't allow other flight members to use fear, sarcasm, or ridicule to ram through or excuse an unsafe "macho" flying event.

Once airborne, and in the midst of "rocking and rolling," with your fangs fully exposed, do not allow the heat of battle to clutter your judgment where you yourself might violate existing and prebriefed ROEs. Fully use postflight debriefs to cover every aspect of the mission. Remember, you are training future USAF airborne

combatants who are very malleable and eager to emulate you. The future of the USAF and their survival rest upon your performance.

Element Lead/Wingmen: Refute the old adage a wingman's job consists of lining up wingtip to arrow, calling bogeys and bingos, as well as keeping your head uncaged with your eyeballs in the full-search mode. Never step out of the briefing room unless you understand all aspects of the mission. Never, I repeat, NEVER allow a prebrief mistake, deviation to USAF regulations, or ROE breach to get airborne. Know your limitations and never allow anybody to lead you into situations requiring you to use your superior flying skills to survive.

Once airborne, guard against the above-mentioned "fangs syndrome." Above all, if you smell manure fast approaching, call knock-it-off before it surges over the horizon and fills your cockpit. You know your ability and limitations better than anybody else can ever hope to. Do not fool yourself. Your life and the lives of other formation members depend on your accurate and timely assessments.

NOTE: If flying away from homeplate as a single ship, you'll have to play the risk assessment roles of all above-mentioned players yourself.

Aircrew/Groundcrew: Provide constant TLC to your mounts through unabated dedication to all handling tasks, "NO" matter how routine or benign they might be. Never, I repeat, NEVER let your Hogs take to the air with any CODES that have not duly been investigated and resolved. Always remember that our old buddy, Murphy, never relaxes nor takes a break. He's forever poised to create havoc and destruction. Whoever fails to provide total dedication to tasks at hand will readily assist Murphy and contribute to the loss of valuable human and material resources.



F/RF-4



LT COL KARL-HEINZ ASCHENBERG,
GAF
Action Officer/AFSA

Who's Who?

■ Upon my arrival at AFSA 3 months ago, and assignment as the F/RF-4 Action Officer, the first question I had was, WHO'S WHO in the F-4 community? Well, by now I know where Birmingham, Alabama, is. I know BOISE is a tongue-breaker for a German, and I know Capt Sidney Mayeux does professional work in safety at Nellis AFB, Nevada.

I charge you operators and maintainers with a similar question: WHO IS LT COL "CHARLIE" ASCHENBERG?

I graduated from UPT in 1968 from Sheppard AFB, Texas. Since then, I've had the pleasure to fly the T-33, T-37, T-38, F/TF-104G, F-4E/F (much of it as an IP), FT-600, MiG-29, and some prop-type aircraft. I flew most of my 4,600 hours out of Sheppard AFB (1967-68 and 1981 until 1986 as a Euro NATO Joint Jet Pilot Training IP), Luke AFB, Arizona, George AFB, California, and Wittmundhaven AB, Germany. My last assignment was with the Directorate of Flight Safety, Federal Armed Forces Germany in Cologne, Germany.

Looking Back

The start of the independent air campaign during the combined attack on Iraq in the early hours of 17 January 1991 was a day which focused some light back on the F-4 community. The F-4G Advanced Wild Weasel's electronic warfare equipment did an excellent job working in "hunter-killer" teams with the F-16C. The F-4G hunter was able to detect, identify, and locate enemy radar, then direct weapons of destruction or suppression against them. The effectiveness of this technique during the Gulf War led the Air Force to retain a single squadron of F-4Gs until a suitable replacement can be developed. As a result, the 561st Fighter Squadron was activated in February 1993 at Nellis AFB.

The flexibility and responsiveness of RF-4Cs proved vital during Operation Desert Storm when bad weather and fires hampered tactical intelligence gathering. This outstanding contribution in 1991 helped us to keep a couple more Phantoms "alive" for us to fly.

You all did an excellent job preserving these vital assets in FY93. Again, the F-4G had no rate-producing Class A/B mishaps. Only one Class A and no Class B mishaps

show up on the flight safety statistics for the RF-4C.

The F-4G Class A mishap is a so-called "nonrate producer" since the mission was flown by a private contractor. I'll discuss the lessons learned from this mishap a bit later.

FY93 in Review

We did a good amount of flying the last year. Total flying hours added up to 32,205, two-thirds of the amount flown last year.

Next, let me spin some FY93 numbers for you.

Figure 1 TYPE MISHAP				
	Class A		Class B	
	No.	Rate	No.	Rate
All F-4s	1	3.11	0	0.00
F-4G*	0	0.00	0	0.00
RF-4C	1	7.34	0	0.00

*One F-4G mishap not included (nonrate producer)

Who is accountable for the Class A mishaps in FY93, and how does this compare with previous years?

Figure 2 CLASS A MISHAPS			
FY	OPS	LOG	UNDET
88	3	4	1
89	4	1	1
90	7	5	1
91	2	2	0
92	0	0	0
93	1*	1	0

*Nonrate producer F-4G

Let's take a look at the Class A mishaps in FY93.

Aircraft on Fire!

A two-ship flight took off to participate in a force-employment exercise. At one point, after entering the exercise area, one of the pilots initiated afterburners in response to a threat indication. A little later, fire lights for both engines came on, and flight lead confirmed the fire. When the aircraft became difficult to control, the crew ejected and the jet was destroyed.

After many years of "false" fire/overheat lights, some of us treat these "false indications" with a smile and go to idle anyway. There have been several cases in the past

in which crews have second-guessed the system, not followed the checklist, and left the affected engine running.

Aircrew complacency toward fire/overheat lights could result in the loss of an aircraft and possibly an aircrew. You, like this F-4 crew, could find out just how fast it can go from the first indication of a problem to pulling the ejection handle.

Collision With the Ground!

The aircraft took off on a pilot qualification sortie, proceeded to the range, canceled flight following, and exited the range. Radar contact was then lost, and the jet flew over a golf course descending to about 500 AGL, rolled out of the turn, and continued for 12 to 14 seconds with a slowly increasing bank before impacting the ground. Neither mishap pilot attempted ejection, and both

unconsciousness during a GLOC episode, called absolute incapacitation, is generally considered to be approximately 15 seconds.

Following this, another period of approximately 15 seconds usually occurs, called relative incapacitation. It is disorientation as to time and place and is characterized by a general unawareness of the situation. Thus, the total incapacitation period is 30 seconds or more. MEANWHILE, NO ONE IS FLYING THE AIRCRAFT!"

The Air Force is approaching the GLOC challenge from two directions — to improve the aircraft and life support equipment design and aircrew physiological training.

The Air Force has provided the ANTI-G SUIT, the STRAINING MANEUVER, HIGH-G CENTRIFUGE TRAINING, the RECLINED SEAT, the IMPROVED G-



were fatally injured.

G-induced loss of consciousness (GLOC) may have been a factor in this mishap, and there may have been a case of G-excess illusion involved. Take time to reread the "Low-Level Turning and Looking Mishaps" article in the October 1990 *Flying Safety* issue.

The AFSA data base indicates that during a 10-year period from 1982 to 1991, there were 19 Class A mishaps resulting in 15 fatalities attributed to GLOC. A 1983 DOD survey shows 579 (13 percent) of 4,337 Air Force and Navy pilots had experienced GLOC.

Let me quote from the 1991 *McAIR Product Digest* (McDonnell Aircraft Co.). "The actual period of

SUIT VALVE, and, possibly, a perfect COMBAT EDGE SUIT.

Still, as operators, we have an important part in this game. Remember the other factors which may predispose us to GLOC: intercurrent illnesses (such as influenza when, in its early stages, GLOC may be the first symptom), heat stress (by diverting blood flow to the skin), an extended layoff from flying high performance aircraft, demanding missions, or even a missed meal or a hangover.

There are some important "lessons learned" from reviewing the FY93 F-4 mishaps. Since we all want to become old, experienced fighter pilots, remember: "Experience is not what happens to you, experience is what

continued



F/RF-4 continued

you learn from what happens to you."

Nice to Know

Since we "zoomed" past the 10,000,000th F-4 flying hour in January 1990, we've added nearly 300,000 more hours. There are some more nice-to-know facts I'd like to pass on.

A day in history all old experienced F-4 fighter pilots will not forget is May 17, 1958. This was the day of the first flight of the "Phabulous Phantom."

From then until the last delivery from St Louis in October 1979, 5,068 copies of BIG UGLY have been delivered all over the world. To date,

the USAF has lost 515 F/RF-4s, for an overall destroyed rate of 5.00.

The Air Force Safety Agency has recorded 748 Martin Baker ejections from the Phantom, reflecting an 81 percent (605 crewmember) survival rate. One hundred seventy-eight crewmembers received major injuries during ejection.

The lesson here is obvious. Take a good, hard look at ejection in Section 3 of your Dash-One. Most of the NOTES, CAUTIONS, and WARNINGS you find there are results of lessons learned from these mishaps.

As long as you are around, you can learn from the fate of fellow fliers. Stick to established proce-

dures, treat any malfunction of our "old airplane" with respect, and know the ejection envelope of your egress system well.

Safety Concerns and Problems Worked

After an honest evaluation, considering the age of our weapon system and the time it will stay in service, we do not have a serious safety concern.

The "log-community" is replacing the center wing fold ribs and inspecting and reworking the BL 44.50 area on the underside of the fuselage. TCTO 1-F-4-1481 concerning the forward upper engine mount is

in effect. The USAF decision to discontinue installation of the "one-piece windscreen" has ended a long fight to improve the bird strike resistance of the F/RF-4 canopy.

Summary

In FY93, the F-4 community lost two aircraft and two invaluable lives.

The FY94 Class A mishap forecast for the F/RF-4 is zero. I challenge you all to live up to this goal. Since 1990, the world has changed dramatically and so has the environment in which we have to perform our assigned mission. Reduced funding for the military, reductions of flight hours, personnel, spare parts, and modifications to our

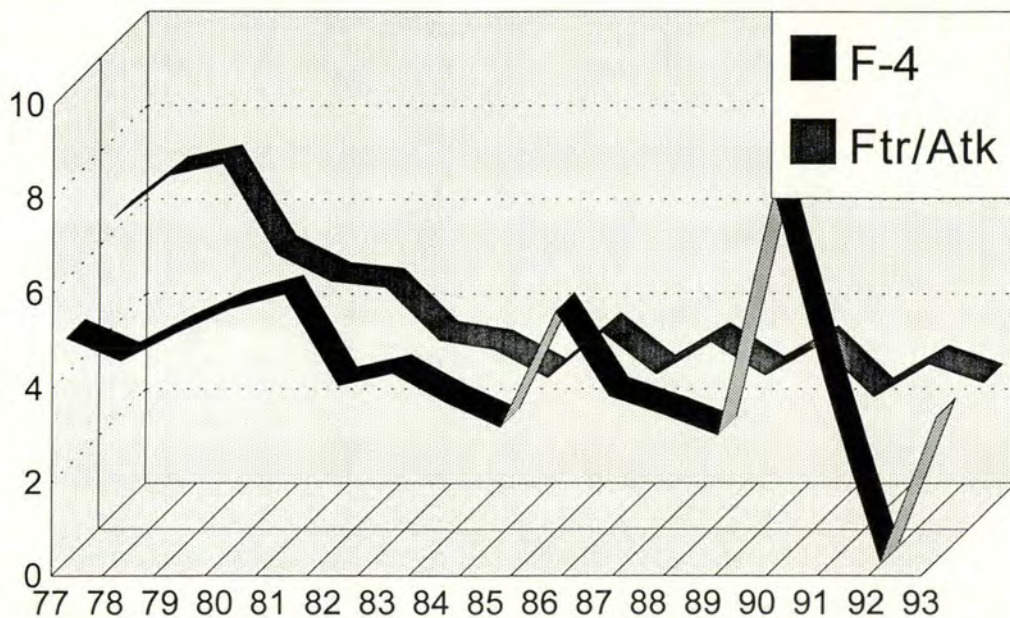
weapon systems are factors we have to cope with. Despite these facts, we have to remember that once we receive our flight orders, we, the aircrew members, are solely and ultimately responsible for all actions pertaining to our mission. Consider the following approach for our daily routine flying.

"Today, if conditions for the given mission are not in our favor, we are able to delay any mission until tomorrow. Today it is necessary to apply new judgment to training missions. History has presented us, like never before, with the factor of extra time. To use this time wisely, and with good judgment, is our own responsibility." (Brig Gen Hans-H Block, Director of Flight Safety, Federal Armed Forces, Germany) ■



F-4 VS FIGHTER/ATTACK

USAF Fleet Class A Rates



as of Sep 93



F-15 MISHAP SUMMARY

LT COL KENNETH J. BURKE
HQ AFSA/SEFF

■ It's time again for the old "Year in Review" article. Thanks to some consistently superb work between maintenance, the fliers, and the support team, FY93 was an excellent year in the Eagle world. Just for the sake of compiling this article. I have kept the F-15 A-D and E-model info together.

The FY93 scorecard read: 217,547 hours flown with three Class A mishaps for a 1.38 rate (mishaps per 100,000 flying hours). This compares favorably to '92 when we lost five Eagles for a 2.26 rate. It's also good compared with the overall USAF fighter Class A rate of approximately 3 per 100,000. Historically, after nearly 2.8 million hours, we've experienced 79 F-15 Class A mishaps, for an overall 2.76 rate.

There also were five Class B mishaps for a 2.30 rate, well below the lifetime rate of 4.47. Keep in

mind, however, that any of these could easily have been a Class A if just one additional factor had been present, or if the driver had not performed correctly.

The AF Class B rate was .60. So why are the F-15 yearly and lifetime Class B rates so high? Primarily for two reasons:

a. We "buy" a Class B once the damage cost exceeds \$200,000 (up to \$1 million). It doesn't take much damage to exceed that bottom-dollar threshold. (Priced out an engine lately?)

b. On a positive note, a lot of F-15 IFEs become Class C or B mishaps after *landing*, that in other fighters would require ejections and resultant Class A's.

The Mishaps

Let's take a brief look at the Class A mishaps for last year.



■ On a basic-fighter-maneuvers mission, after performing a few warmup turns, the aircraft had some flight control problems, particularly with pitch control. During return to base, the problem with control response became progressively more severe, and the aircraft finally went totally out of control. The pilot ejected in a high airspeed roll and suffered serious injuries.

■ During an air defense mission with a three-bag configuration, the left external tank did not feed. An angle-of-attack problem put the aircraft into an oscillatory spin. When it would not recover with the fuel imbalance, the aircraft transitioned to a flat spin. The pilot safely ejected, and the aircraft spun into the water.

■ After converting on a dissimilar-air-combat-tactics adversary, the aircraft departed controlled flight. It went into a roll and would not re-

cover. Still out of control, the pilot ejected, sustaining moderate injuries. The aircraft continued to roll all the way to the ground.

Class B Mishaps

■ An E-model wingman got a little too close to his flight lead's weapon's trajectory. His aircraft suffered significant battle damage after unintentionally rejoining with a BDU-33.

■ Another speed brake failed in flight. Parts of the speed brake separated and caused structural damage to the area around the left vertical stab and afterburner.

■ One Eagle had an in-flight engine failure and fire. The fire subsequently was extinguished, and the aircraft was landed safely.

■ Landing in a rain shower, an E-model experienced antiskid failure on one main landing gear. An

attempted departure end arrestment was unsuccessful. The aircraft skidded off the wet runway, and one of the main gear collapsed.

■ Thirty minutes into the flight, a master caution light and hydraulic light were observed. An IFE was declared, and the aircraft safely returned to base. The crew chief noticed smoke coming from the right main landing gear area.

In at least two of these mishaps, the difference of mere fractions of a second, or a few knots change in airspeed, separate them from being Class A's. On the other hand, they could have gone the other way and been near-miss nonevents.

Other Concerns

If I say "out of control," will anyone be surprised? Unless you've

continued

F-15 MISHAP SUMMARY_{continued}

been asleep under a rock for the last couple of years, every Eagle driver is painfully aware of the problems with, and concern for, the out-of-control problem. All three of this year's Class A's as well as two of last year's, involved out-of-control situations. The user MAJCOMs are keenly interested in this problem, as is AF/SE. Commonly identified causes (not in any order of significance) for F-15 departures are:

- Major flight control failures.
- Flight controls out-of-rig conditions.
- Lack of flight test information for the E-model.
- Control inputs while in the region of reduced stability.
- Exceeding Dash-1 limits with known fuel imbalance.

Major flight control failures are not a common occurrence. Also, while an out-of-rig flight control can be a contributing factor in out-of-control situations, usually one of the other causes is present in most of the reported incidents.

The attention given to this problem has generated some positive results. As an example, the 325 FW has realized a significant decrease in controlled flight departures after instituting several initiatives, some of which are:

- Added several flight control systems checks during the aircraft's periodic inspections.
- Increased emphasis on Advanced

Handling Characteristics training in academics and flying sorties.

- Updated replacement training unit syllabus to reflect modern AHC/BFM profiles tailored to anticipated tactical applications.

Maj Mike "Nike" Winslow, at the 325 FW, has put together an excellent brief on "Solving the Eagle Departure Problem." Definitely worth a look if you can get a copy.

More good reading on this topic can be found in "Control For High Angle of Attack," McDonnell Douglas Test Pilot, in the June 1993 addition of *Aerospace Digest*. If you haven't read it yet, I recommend you do so soon.

One last safety pitch. We have

learned a lot of lessons from previous mishaps and HAPs. We can continue to benefit from these experiences, but only if they are shared. If you have a mishap or an out-of-control situation, document it and report it as thoroughly as possible. If you should have the opportunity to investigate a mishap or HAP, do so thoroughly, and remember the philosophy of future mishap prevention when determining findings, causes, and recommendations.

FY93 was special because we had no Eagle Driver fatalities, but over the years, we have lost a lot of great fighter pilots. All of us need to do our part to prevent future mishaps.

Fight's on! Check six! ■





F-16

MAJOR BILL WAGNER
F-16 Action Officer/AFSA

■ FY93 was a relatively good year for safety in the Viper. In spite of the massive downsizing of many of the squadrons from 24 to 18 aircraft, and the ever-tightening budget constraints leading to less exercise involvement, this year was not bad. The adverse part of the equation, however, was the nature of the mishaps which did occur.

The **operations** rate was nine mishaps for 2.1 Class A's per 100,000 flying hours; the **logistics** rate was eight mishaps per 100,000 flying hours for 1.8. There was also one bird strike.

Of the eight logistics mishaps, two were attributed to the uncommanded closure of the main fuel shutoff valve (MFSOV). As a result, indepth investigation of the nature of the closures is now ongoing.

Total engine mishaps still account for over three-quarters of all logistics

F-16 Class A Statistics

Time	Number	Rate	Destroyed	Rate	Fatalities	Hours
FY 92	18	4.04	18	4.04	9	445,000
FY 93	18	4.14	18	4.14	5	434,000
LIFETIME	188	5.04	180	4.83	65	3,730,000

Let's take a quick look at the numbers. Listed above is an inventory of this past year's statistics for both Class A mishaps and for destroyed aircraft. The prediction for FY94 F-16 mishaps is also 18, but I hasten to add, that's not our goal!

mishaps. Believe it or not, no fatalities have resulted from an engine failure, fortunately.

There were no Class A mishaps this year in the -220. Although it lacks thrust, it is still a good, dependable motor.

continued

F-16 continued

The -229 was approved to be fielded in the block 52 F-16s. The fourth turbine blade problems will continue to draw close attention.

The ACES II seat continues to be a great seat with a 92 percent success rate.

Broken Bodies, Twisted Metal

Of the 18 Class A's this year, almost two-thirds of them were human factors related, either in the air or on the ground. Most regrettable among these have been the incidents of **collision with the ground**. Five aviators and four jets were lost due to living on the edge or not having an out.

Getting low and in the weeds still demands that margin for error. Planning to pull out based on visual cues above a featureless desert floor should not be at the top of your techniques list.

And finally, if you have problems controlling the jet (no matter what the source of the problem), pointing the nose back down towards the earth instead of knocking it off is not consistent with longevity in the flying business.

The other fatality this year involved a **collision on the runway**. One pilot was cleared to land at the same time another was cleared for takeoff. The final message for this one is well worth the time spent to read it.

Of the eight logistics mishaps, four were attributed to the -200 engine, and two were attributed to the -100 engine.

Another fatality was not Air Force and, therefore, did not make it into the F-16 stats; nevertheless this was a tremendous loss for the F-16 community. The pilot **split-S'd** from 2,100 feet AGL. He recognized his danger, bailed out about 500 feet AGL, and might have made it, but got caught in the fireball from the exploding aircraft. We'll never know for sure why this very experienced pilot decided to do the split-S.

Another big ops topic this year

was something I despise having to mention: **rejoins**. Remember back to the chair-flying sessions with your instructor in UPT? He would set up the scenario as "Okay, Stanley, you're out there rejoining on lead, and now you start getting ahead of the line. What do you do?"

Being the golden hands, steely-eyed, trained killer-to-be, you responded by rote, "I roll out and get back to the line."

"A+, Stanley." The ambitious FAIP would continue, "But now you're into the final portion of the rejoin and you need to overshoot. What then?"

Like a good student, you espouse, ad nauseam, the finer points of the overshoot. You emphasize maintain-

ing nose-tail separation.

"Good job, Stan."

Now let's put it into practical application. Do you do a **barrel roll** to regain position? Do you overshoot **underneath** lead? As lead, do you allow either of these?

As we employ advanced medium range air to air missile (AMRAAM) and get involved in beyond visual range (BVR) tactics and the finesse involved with precision guided munitions (PGM) deliveries, looks like it's time to dust off the lessons from back in UPT one more time.

Another mishap involved **fuel mismanagement**. The pilot was on deployment practice mission with the dreaded three-tank configuration. The tanks did not feed proba-





bly because of water vapor freezing inside the vent and pressurization valve. The pilot had significantly less useable fuel available to him than he initially thought. The engine flamed out in the final turn.

I think the lessons learned out of this one do not need to be expounded upon. As an aside, the quality deficiency data, as a whole, has shown an upturn in the number of vent and pressurization valves submitted as well as other parts of the external tanks.

Recommendations

Recommendations that have been made again this year include wiring the MFSOV open for all MAJCOMs, active and passive ground collision

avoidance systems, and cockpit resource management for fighter pilots to avoid the rash of human factors-related mishaps. The Dash-One continues to be "refined" (read this one "expanded") to legislate common sense; but, thankfully, we have avoided instituting piddle pack training.

Issues

Areas of continued concern for the safety community in the F-16 are the **convergent exhaust nozzle control (CENC)** for the -200 motor. We will continue to trade out the old CENCs for the hybrids but in the meantime, check that nozzle before coming out of AB on initial takeoff, and make sure you have enough smash to make it back to the field if it sticks open.

Practice those odd-altitude, off-angle **simulated flameout patterns** because you probably will not be directly over the field when the motor unwinds.

An incident that happened in one of the overseas commands highlights the fact "**three green**" may, in fact, be less than that. The threads in one of the main gear struts developed a crack which propagated straight out and allowed the inner cylinder to almost come out. The end of the story was a happy one, but get a chase plane when in doubt.

Continue to train as hard as you have, but take an occasional look at that Dash-One because you never know when your chance to shine will come up. Check six! ■



F-16

LOGISTICS MISHAP SUMMARY

ROBERT B. ENGLE
MAJOR BILL WAGNER
Air Force Safety Agency

Logistics

■ Logistics mishaps accounted for almost half of the 18 F-16 Class A mishaps last year. Two were attributed to main fuel shutoff valve (MFSOV) closure in flight and six were engine-related.

Engines

Engine-related mishaps accounted for one-third of all F-16 Class A mishaps in FY93. The mishap statis-

F-16 Engine Related Class A Mishap Statistics

Engine	FY 1992			FY 1993		
	Class A Mishaps	1992 Rate	6 Qtr Rate End 1992	Class A Mishaps	1993 Rate	6 Qtr Rate End 1993
F100-200	4	2.39	1.54	4	2.56	3.28
F100-220	2	2.57	1.82	0	0	0.73
F110-100	1	0.56	1.10	2	1.54	1.36
F110-129	0	0	0	0	0	0
All Engines	7	1.65	—	6	1.60	—

* (1) Rates are mishaps per 100,000 flight hours

** (2) Hours for the last quarter for FY93 are estimated

*** (3) 6 Qtr rates = mishap rate for the previous 6 quarters. This parameter gives a good indication of the current health of an engine program.

**** (4) The F110-129 engine had only 10,019 total flying hours through FY93

tics are shown in the figure. The apparent good news is there was one less engine-related mishap than in FY92. Unfortunately, it is not time for celebration. We flew less in FY93, and the overall engine-related mishap rate of 1.60/100,000 flight hours was only slightly lower than the FY92 rate of 1.65, certainly not enough improvement to brag about.

Looking to the future there are some very positive signs for improved propulsion safety. The engine contractors and Air Force management have expressed a concern about propulsion safety and have made a commitment to reduce the engine's contribution to the F-16 mishap rate. On the Air Force side, this concern has been translated into action with the addition of another propulsion safety engineer at the Air Force Safety Agency.

As in the past, there are certainly many lessons learned from the engine-related mishaps for the wrench benders. However, unlike past years when the operator had a chance to break the chain of events in many of the mishaps, this opportunity was afforded only once in FY93. Let's review last year's significant engine-related mishaps.

F100-200 Engine

Several recurrent themes have come up again this year resulting in continued high-level attention to the -200, the oldest engine in the F-16 fleet. The most distressing are the cases where mishaps were caused by problems which were well known and documented and were causal in previous mishaps. As in



Engines continue to drive the F-16 logistics mishap rate.

the past, if all -200 engines had been converted to -220Es, one or two of our mishaps would have been prevented.

One of the Class A mishaps from last year was attributed to contamination which prevented the control system from closing the afterburner (AB) nozzle after AB cancellation. This resulted in a loss of thrust and, eventually, loss of the aircraft. This mishap had one positive effect. It drew attention to the main culprit in loss-of-thrust situations, the CENC (convergent exhaust nozzle control). The depot is expediting incorporation of a "hybrid" CENC which addresses most of the problems seen in the older classic CENC; however, awareness of the nozzle position and critical action procedures (CAPS) for "thrust loss" are particularly prudent with this engine in the F-16.

Another mishap was caused by failure of the 2-3 air seal in the engine fan section. Failure of this seal has caused the loss of three F-16 aircraft and two F-15 aircraft in the past years. The life limit for this particular seal has been reduced, and all parts over the new limit have been removed from service.

A Class B mishap was caused by failure of the RCVV (rear compressor variable vane) retract line which is a high pressure fuel line. The failure caused loss of thrust and a fire. There have been several previous failures of this line, and all have been attributed to rough handling during maintenance. This tube is replaced when we convert to the -220E. As a result of its failing and the time necessary for the -220E conversion, all of the RCVV retract tubes will be replaced on the existing -200 engines.

A no. 5 bearing oil scavenge line leak and oil fire caused another mishap. This incident is particularly disturbing because of the numerous known problems with this compartment and the increased focus on no. 5 bearing compartment maintenance awareness. A redesign of the bearing plumbing is in the works; however, current tech data procedures must be followed exactly as printed.

continued

F-16 Logistics Mishap Summary continued

To prevent flight line mistakes, HQ ACC has directed that bearing plumbing is off limits for organizational level maintenance.

Loss of thrust and stalls were the initial symptoms of another F-16 mishap with the -200 engine. This mishap was preceded by maintenance efforts to fix a similar writeup. The most probable cause of this mishap was noise in the N1 speed signal to the electronic engine control (EEC) and deteriorated compressor tip shroud abradable coating. The depot is incorporating an improved design N1 speed cable and 100 percent refurbishment of tip shroud abradable material; tech data was changed to provide improved troubleshooting procedures.

It is obvious that to reduce the F100-200 mishap rate, we must solve the problems which have caused past mishaps. We cannot afford repeats. The continued conversion to -220E configuration will also help.

F100-220/220E

The 220 engine is the bright spot for F-16 propulsion. NO -220 ENGINE-RELATED MISHAPS FOR FY93!!! If the increased level of awareness of safety continues and potential problems such as turbine incidents and no. 4 bearing area incidents are addressed and resolved, this record should continue.

F110-100

There were two F110-100 mishaps last year compared to one the year prior. One resulted from a fuel tube failure caused by improper safety wire installation. A one-time inspection, along with tech data revisions, has resolved this problem.

The other mishap was caused by a second-stage fan blade failure. This mishap is the first indication of a problem with this part. No blades have previously failed or been found cracked. Inspection proce-

dures are being developed on the other mishaps, but the investigation is still continuing.

Summary

Putting it all together, several etched-in-stone lessons have been relearned this year. First, each individual in the chain, including the depot and contractor folks, can "break the chain." Secondly, a careless work ethic, poor attention to detail, or failure to really define and take appropriate action to resolve problems will catch up with you sooner or later. For operators, the message is the same as last year. Practice every engine problem you can get in the sim. Make sure you're up to speed on energy management in the flameout pattern because you never know when an opportunity to shine will come your way. ■

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F/EF-111

MAJOR NEIL "BONE" KRAUSE
Action Officer/AFSA

■ It's been a busy year. The D- and G-models have all made the one-way trip to The Boneyard, Upper Heyford is closing down, and all E-models are now at Cannon. We'll be down to about 150 airplanes by December of 1993. Amidst all the turmoil, though, the F-111 still turns in an impressive safety record.

Lifetime History

At the end of Fiscal Year '93, the F/EF/FB-111 had 129 Class A mishaps and 107 destroyed jets. Operational factors account for 43 percent of the Class A's, and logistics factors were responsible for 46 percent (the rest consisting of "other" factors, mostly bird strikes and "unknown" causes). These numbers equate to a lifetime Class A rate of 5.96 per 100,000 flying hours.

We've had 84 fatalities, including 3 civilian deaths in midair collisions. (For those of you wondering why

that leaves an odd number of fatalities for crewmembers, the answer is at the end of this column).*

We've also had 81 ejections (159 if you count combat ejections), with 79 percent successful (in both cases).

'93 — A Good Year

The F-111 ended FY93 with only one Class A (logistics) mishap and a rate of 2.08 per 100,000 flight hours, down from 2.82 the previous year. Compare that number with the overall fighter/attack rate of 3.67 and you'll see we're doing pretty well.

The single Class A started with a bang, closely followed by a yaw and a right fire light. A failed bearing had allowed the high-pressure compressor to shift, starting an uncon-

*And the answer to the odd number of crewmember fatalities: The first F-111 mishap involved a landing short of the runway in a high sink rate. The IP died from burns received rescuing the student.

continued

trollable titanium fire. Confirmation of flames on the right side led to an ejection.

For those of you feeling a sense of *deja vu*, you aren't alone. This same scenario happened 2 years ago and ended in a Class B mishap. That crew was lucky (in a twisted sort of way): The fire went out. A new #3 bearing design, already used in the Navy's TF-30 engine, was the agreed solution. Unfortunately, 2 years later, we don't have a single F-111 flying with the new bearing.

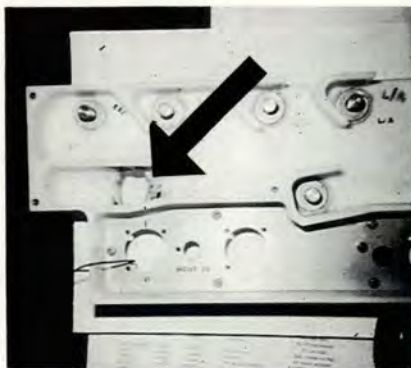
JOAP analysis can detect signs of impending bearing failure by identifying wear metals present in the oil. Increasing iron concentration can indicate a failing bearing. Unfortunately, if you add oil to the system it dilutes the sample, and the concentration doesn't increase. JOAP analysts must take this into account, but they can't if oil servicing isn't properly documented.

Another good reason to properly document oil servicing: increasing oil consumption can also indicate a failing bearing (among other things). And the old "rule of thumb" of keeping the Vark a little below the "full" mark won't help much if the next person decides to top it off. Try telling how much oil the engine is burning when you do that!

A Close Call

There were no Class B mishaps to report this year (except FOD), but one incident came close. It started with navigation system malfunctions followed by an equipment hot light, reduced cockpit airflow, an uncommanded pitchup, and numerous caution lights. After a successful, yet exciting, divert and landing, an extensive forward equipment bay fire was confirmed.

The main line contactor assembly (MLCA) is a plastic plate with nine terminal studs holding big cables carrying lots of amps from the generators (see photo). Several things can happen if the cables aren't tightened completely or if the self-locking nuts back off:



Main line contactor assembly. Note the missing and burned terminal stud (arrowed).

- Electrical arcing interrupts nav gear, flight controls, and circuit breakers;
- Fire starts in the forward equipment bay;
- The MLCA plate melts and dripping plastic trips the circuit breakers.

Now crewmembers can put another set of indications in their "clue bag," and maintainers can better appreciate the importance of the nuts on the MLCA. Knowledge is the key.

Concerns

Force structure changes are hitting everyone hard, but especially the F-111 community. The rapid draw-down of the Vark fleet has central-

ized the Vark community in eastern New Mexico, with both good and bad effects. Rumors of more F-111 and personnel cuts make career planning even more vague. Throughout this turmoil, remain focused on the job at hand — flying or fixing the jet. The consequences of a wrong decision are much more serious than a bad career move.

For EF-111 supervisors (and crews): Deployments take their toll. Worldwide responsibility can stretch everyone thin. Watch for signs of burnout in your pilots, EWOs, and maintainers. And keep an eye on each other. Know your limitations.

On the logistics side, stress engine knowledge. Engine incidents accounted for 20 of the 41 reportable incidents this year. Don't shortcut engine maintenance or writeups, and keep up the simulator and EI scenarios.

Finally, landing gear problems appear to be making a comeback. We haven't had a gear-related Class A or B since 1981, but we had three reportable incidents this year. At least one could have easily turned out much worse.

Overall, the F-111 has a good record compared to other fighters. With a little care, we can better that record, until the last Vark makes the long haul to Davis-Monthan. ■



GO DOWN! GO DOWN!



Although written from the Navy perspective, this story highlights the importance of knowing the station times and numbers of aircraft planned for each refueling orbit. If you don't know how to get this information, see your unit tactics officer for a detailed explanation. — Ed.

■ We can all probably rattle off the sayings we are taught in training. "Never assume anything," "Complacency kills," and "Maintain a solid lookout doctrine" are just a few of the all-time favorites. All three apply to an experience I had in the Arabian Gulf.

It was just another glorious, hot, summer day. Our crew was scheduled for the midday launch, and we were now busy, slowly boiling in our own juices in our Prowler. We were providing jamming support for a section of F/A-18s flying against F-15s. I was looking forward to being ECMO 1* for this flight, since it would be my first time fac-

ing F-15s. Finally, when we looked well done, they broke us down and we headed for the catapult.

After a solid shot, we cleaned up and started a climbing turn west, heading for the beach. We passed by the mid-Gulf tanker track, but did not see the KC-135 we knew was on station there. Our playmates were getting a quick gulp of gas and would meet us in the area.

We called the F-15s after our rendezvous with the Hornets and flew several runs against them. The training was over too soon, and we joined up on the Hornets for the short flight back to the ship.

Checking through Bahrain Center at FL200, the flight turned east to a "sweet lock" on Mother (a good signal for the boat). Looking at the Hornets on our left, my pilot and I saw the Air Force tanker heading west, 1,000 feet below and 3 miles off. We decided to break off the Hornets and head back to the ship as a single. After kissing them off, we started a slow descending right turn to the southeast.

Approaching 19,000 feet, my pilot and I were both looking forward and to the right when something just did not feel right to me. A quick look inside the cockpit showed nothing was wrong, and looking outside to the left I did not see anything. Something still did not feel

right, so I leaned forward and looked left again. Out from behind the canopy rail loomed a KC-135 and two fighters, co-altitude and nose on at less than half a mile!

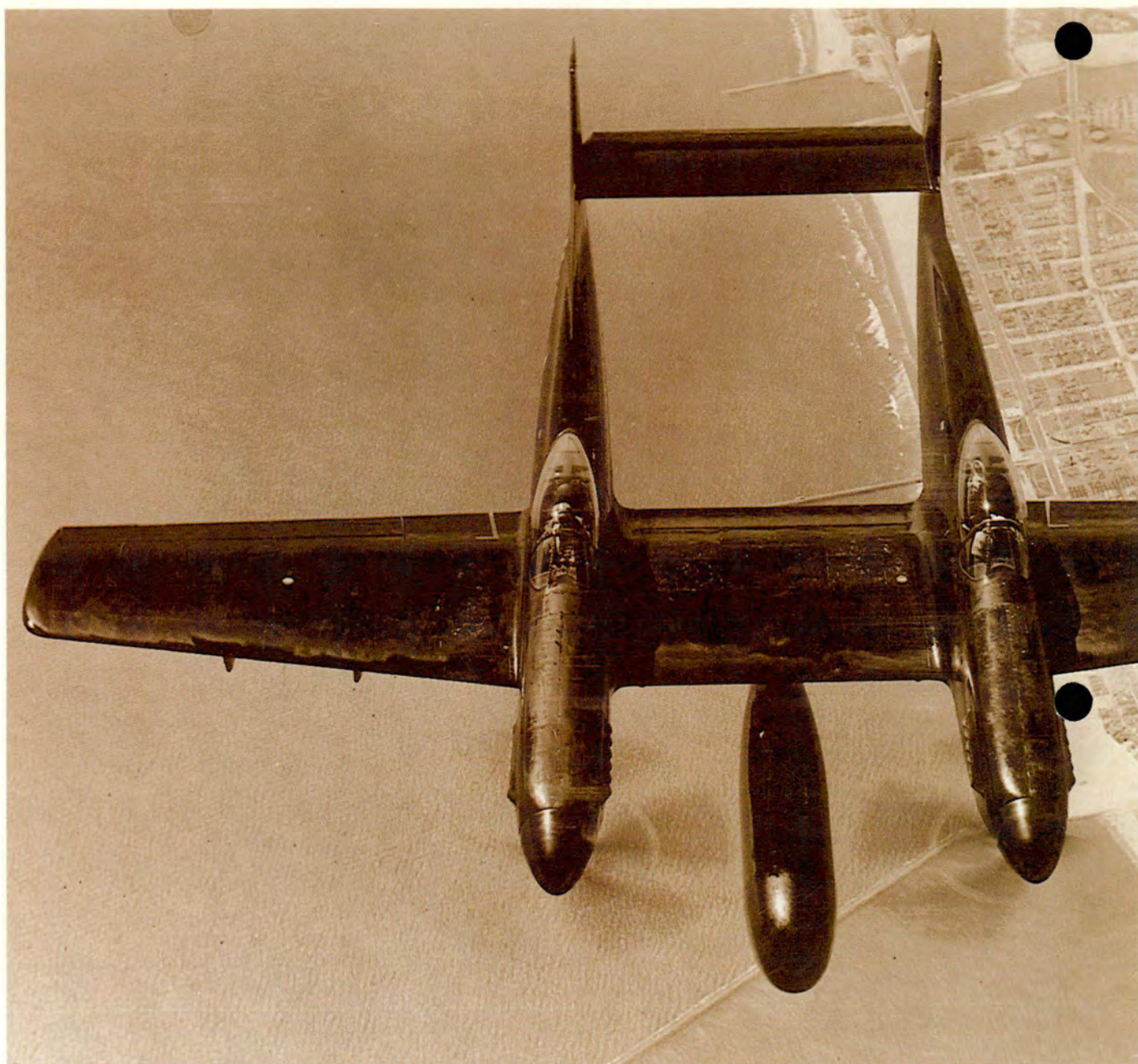
I mashed the ICS button down and stammered, "Go down! Go down!" My pilot reacted instantly, jamming the stick forward. We dropped like a stone as the killer tanker and company flew right through where we would have been!

Later, back at the boat, we reviewed our near midair in the debrief. We had known we were near the tanker track, but had seen the tanker going the other way. We assumed there was only one tanker, as was usual, and we knew he was behind us. That assumption almost got us an interservice kiss of death. Our front-cockpit lookout doctrine had also broken down in the turn, allowing the tanker to get much too close before we picked him up.

On the plus side, our crew coordination in getting out of the situation was very good. My pilot reacted instantly to my nonstandard call to descend. He never looked outside to confirm why I wanted to descend—he just did it. That trust probably saved our lives. We have since standardized our calls in the front cockpit and developed a solid lookout doctrine. ■

Courtesy Approach Magazine

*Electronic counter measures officer—equivalent to Air Force electronic warfare officer.



YOUR WINGMAN IS YOUR COPLOT

**MAJOR BILL WAGNER
DR AL DIEHL**
Air Force Safety Agency

■ No, this isn't about flying the F-82 in Korea. Rather, it concerns applying "Cockpit Resource Management" (CRM) concepts in today's fighters — especially the single seaters. As our buds returning from recent interviews have reported, these CRM skills are a requirement for getting an airline job. Furthermore, we've all heard rumors about this stuff being important to Air

Force many-motor flying for some time. But, what's that got to do with flying fighters?

The answer to that question can unfortunately be found in many of our mishap reports. In one mishap, lead had his three-ship in a wedge formation. The weather was closing in presenting the mishap pilot with a "box-canyon." The overcast ceiling limited the altitude available. This forced the flight below the minimum altitude of 1,000 AGL established for the first-look at this area during the exercise.



Photo courtesy of Air Force Museum, Wright-Patterson AFB, Ohio

No. 3 requested a hook turn to avoid the weather and did a route abort. As the mishap pilot (MP) called for, and then executed this turn, he encountered high terrain and impacted a ridge. Although the no. 3 pilot was not to blame, he could have been directive about going the other direction as he saw the conflict developing.

Lead had quite a load of personal baggage." Most of the squadron knew the MP had two full-time civilian jobs. The MP's personal life was also abound with conflict. He

was summoned to appear in court 3 days after the exercise started. The state was threatening to garnish his wages for child support. He was also significantly in debt with several major credit cards maxed out. The day of the mishap, the signs of stress were showing through, his preflight briefing omitted several important items, and he forgot his harness on the way to the jet. The bottom line was the other pilots in the squadron were in the best position to call a knock-it-off BEFORE this guy became a statistic.

Poor communication contributed to another mishap. During the preflight briefing for a routine cross-country on an alert change-out, the flight commander sent no. 2 off to get the latest weather. No. 2 learned the weather was going down, and by their ETA, it would definitely be IMC. No. 2 dutifully wrote this on the DD Form 175-1. But when he got back to the briefing, lead was winding up by saying he wanted to see a "sharp" overhead pattern on arrival (presumably to impress the unit being relieved).

No. 2 handed lead the form with the note about the weather going down — without comment. Lead ignored this note and told everybody to "step." Lead first learned about the IMC when he tuned in the automatic information system (ATIS). He then announced they would be doing a five-ship aircraft single launch and recovery (ASLAR). Nobody challenged this even though they knew that wing standards said a four-ship was the max. During the approach, the weather continued to deteriorate — rain, turbulence, etc. No. 5, who was on his first mission ready (MR) deployment, got distracted and forgot a critical step-down altitude. He hit a tree-covered ridge line but managed to eject successfully. The jet literally ended up in a farm house (which the taxpayers bought).

The investigation revealed another intercockpit coordination problem. No. 4 had unintentionally flown through the TACAN course and decided to come back HARD — too hard evidently for the inexperienced guy in trail. No. 5 didn't anticipate such a vigorous correction,

overreacted, got into buffet, lost-lock, etc.

When no. 4 was asked why he did not warn no. 5 with a radio call, he said he didn't want to look bad to the "guys listening on the ground" — another statistic in the making.

Remember, fighter pilots almost always fly and fight as team members. Furthermore, our "team" includes not just the people in our flight, but all the folks with whom we communicate and coordinate: AWACS, ATC, Command Post, maintenance, FACs, tankers, Weasels, etc. Of course, these guys are not usually seated next to us, and, furthermore, time is typically very critical in the fighter game. Ergo, we need this CRM stuff as much (and maybe more) than those guys flying the heavies.

The Naval Safety Center was the first organization to reach this conclusion. "Aircrew Coordination Training" was introduced into their A-6 training wings in 1989. Their mishap rate dropped dramatically in the years following. (See R. A. Alkov's *Approach* magazine article, January 1991.)

This success didn't go unnoticed by the Air Force. Various MAJCOMs have introduced similar programs in the last 2 years under a variety of labels: Cockpit Attention and Task Management, Aircrew Attention Awareness Management Program, and Performance Enhancement Program. These programs went one step beyond the traditional CRM courses — they included a heavy dose of situational awareness concepts.

The Air Staff recently decided Crew/Cockpit Resource Management training should be a requirement for ALL USAF aircrew members. They tasked Headquarters Air Education and Training Command (XOTA, Maj A. T. Kern) to take the lead on the important project. This has included drafting the Air Force Instruction (with the assistance of HQ USAF SE), the first step to bringing such training on-line. So CRM "will be coming soon to a theater near you." See the CRM article in last month's *Flying Safety* magazine for some details, and remember your responsibility to the guys on your wing. ■





For Want of a Nail

A
MAINTAINER'S
PERSPECTIVE



CAPTAIN DEBRA A. SHATTUCK
Travis AFB, California

■ I will never forget that radio call as long as I live. One frantic voice yelling, "2-5-3 is engulfed in flames!" The panic in the voice was evident, but as my maintenance superintendent and I sprinted for our truck, I prayed the voice had somehow exaggerated the situation — even now, maintenance personnel were scrambling to bring halon fire extinguishers to bear on a small, easily contained fire.

Thirty seconds later, as we cleared the row of maintenance hangers rimming the flight line, the prayer died in my throat. It was instantly

clear nothing was going to put this horrible fire out. No amount of heroics, chemicals, or water was going to stop a blaze of this magnitude, feeding voraciously on 95,000 pounds of fuel, and it methodically worked its way, tank by tank, across the wings of a once-proud C-141B *Starlifter*.

The scene was chaotic, yet controlled. Maintenance personnel raced to hook up tow vehicles so nearby aircraft could be moved. Others frantically drove around trying to account for everyone who had been on the aircraft at the time of the explosion. For 15 tense minutes, the whereabouts of one crewmember was unknown. Each sickening "pop" of another fuel tank bursting

intensified the realization that if someone was still on the aircraft, they would not come out alive. Finally, thankfully, the last crewmember was accounted for. The ultimate disaster had been averted.

Base firefighters valiantly fought the unyielding blaze. They poured thousands of gallons of agent on the aircraft and on the lake of burning fuel which ominously worked its way across the tarmac toward another C-141 that maintenance crews had been unable to move. As tongues of flame lapped at the tail section of this aircraft, it seemed inevitable it, too, would be destroyed. But after a fierce battle with the stubborn enemy, the firefighters pre-

continued

Worried About What's In Your Future?

For Want of a Nail

continued

ailed. Sheer determination and bravery had saved the second aircraft. It was a small victory in an otherwise dismal day.

In the months following this incident, I have spent a lot of time thinking about safety. I have come to the realization the line between a safe operation and an unsafe operation is infinitesimal. We've all heard the old adage about a kingdom that was lost for want of a nail in the shoe of a knight's horse. How many aircraft

and lives have been lost for want of a small piece of safety wire, or from an improperly torqued bolt, or a tiny fatigue crack in a critical flight surface?

Aircraft maintenance is a dangerous business. Parts can fail, "proper procedures" can be ill-conceived, and people do make mistakes. Mishaps *will* happen, but we can minimize them by making safety a mindset at all organizational levels.

At the macro level, a safety mind-

Stay focused on your job or your worries may end.





set influences the Air Force-level and command-level planners to consider all the ramifications of sweeping organizational changes on field level squadrons before they implement those changes. It leads them to follow through on changes to ensure those affected have the equipment and training they need to continue doing their job safely. A safety mindset influences engineers to check and recheck their designs to ensure components are as inherently safe as possible.

At the micro level, a safety mindset helps individual mechanics fight the urge to take shortcuts. It influences them to always do a task right the first time — even when no one is watching. A safety mindset motivates mechanics to actively seek to understand as much as they can about their job and the role it plays in keeping an aircraft safe. A safety mindset influences supervisors to

demand and expect adherence to proper maintenance procedures. It leads them to hold subordinates accountable for their actions when they fail to meet those standards.

The bottom line is a safety mindset is required at all functional levels. Each one of us has a responsibility to accomplish our jobs safely. Beyond that, leaders and managers at all levels have the additional responsibility of ensuring their actions do not adversely impact the safety of operations down “in the trenches.”

What did happen in the mythical kingdom lost for want of a nail in a horse's shoe? Was the disaster caused by a blacksmith who had grown complacent and simply didn't do his job to the best of his ability? Or was it caused by a poorly designed nail failing at a critical moment? Was it the result of too many changes in the infrastructure of the kingdom? Changes which pro-

foundly altered the way the blacksmith had done his job previously. Changes that left him without the materials, tools, and training to do his job properly. Or was it something else? We will never know — but all of us can play a role in shoring up the thin line between safety and disaster in our own kingdoms. ■

Our thanks to Captain Debra A. Shattuck, Maintenance Supervisor, 602d Aircraft Generation Squadron, Travis AFB, California (DSN 837-0415) for her article. If there are other maintainers who would like to submit articles of interest to Flying Safety and the aircraft maintenance community, I'd like to hear from you. Call me personally at DSN 246-0936 or use our Safety Hotline, DSN 246-0950, Commercial 505-846-0950, or DDN grigsbyj%smtps@afsa1.saia.af.mil. — Ed.



CAPTAIN FIRST LIEUTENANT
Karl R. Maybury **Mark A. Aown**

HQ 376th Airlift Wing
Wright-Patterson AFB, Ohio

■ Capt Maybury and Lt Aown flew to Craig Field in Selma, Alabama, to drop off four C-12 crewmembers, then refueled and departed Selma for Dover AFB, Delaware, with one passenger.

Approximately 13 miles from Craig Field, the left engine abruptly failed. Ten seconds later, the right engine also failed. The power loss was not preceded by any indication of impending failure. The crew attempted to restart both engines by immediately switching on both fuel boost pumps and both air igniters. The engines did not respond.

As airspeed began to decay, Lt Aown visually acquired an abandoned civilian airfield. The obstructed runway was also the only option available for a survivable landing. Capt Maybury tried once more to start the right engine using starter-assist procedures, again with no initial response.

The crew configured for a power-off landing with landing gear and approach flaps. During the final approach, the right engine began to wind back up and recovered initially to approximately 75 percent power and moments later to full power at 1800 feet AGL. The crew decided to return to Craig Field since it had emergency equipment and a better landing surface.

With Craig Field in sight, a final attempt was made to restart the left engine, again with no response. Capt Maybury accomplished a successful single engine approach and landing, cleared the runway, and shut down the aircraft. The total flight time was 8 minutes. Post flight inspections revealed the cause of the engine failures to be fuel contaminated with water, bacteria, and debris.

C-21A aircrew training does not address dual engine flameout emergencies. The prompt and professional action taken by Capt Maybury and Lt Aown prevented the destruction of a valuable Air Force aircraft, but more importantly, preserved three irreplaceable lives.

WELL DONE! ■



UNITED STATES AIR FORCE

Well Done Award

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outstanding airmanship
and professional
performance during
a hazardous situation
and for a
significant contribution
to the
United States Air Force
Mishap Prevention
Program.*



L. to R. Maj Michael P. Hodgson, SSgt Mark T. Pryor, Maj Stephen W. Kniatt, and SrA John W. Callard.

MAJOR
Stephen W. Kniatt

STAFF SERGEANT
Mark T. Pryor

MAJOR
Michael P. Hodgson

SENIOR AIRMAN
John W. Callard

**First Helicopter Squadron
Andrews AFB, Maryland**

■ Major Stephen W. Kniatt and crew were conducting emergency procedure and transition training at Tipton Army Airfield, Maryland. While on short final for a steep approach, Major Kniatt noticed the left tail rotor directional control pedal would not move forward of neutral. A go-around was immediately accomplished, and the crew began to analyze the situation.

Both pilots' tail rotor control pedals were visually checked for obstructions. The crew performed a thorough check of the force trim and hydraulic systems but were unable to find the cause of the pedal blockage. The crew determined they could maintain level flight with normal control inputs and that left pedal travel was insufficient when more than 50 to 60 percent torque was required. The crew evaluated their landing options and decided that Andrews AFB, a short flight away, would be the best place to land because the crash support and landing options there were the best available.

En route to Andrews, the crew thoroughly reviewed Dash-One procedures for landing with the pedals stuck in neutral. Major Kniatt declared an emergency and set up for a shallow approach to the runway. The crew called out power and airspeed readings and monitored all instruments, allowing Major Kniatt to devote full attention to lane alignment.

Major Kniatt executed a flawless slide landing, touching down at 20-25 knots, using throttle to control heading until the aircraft was brought to a stop. Post flight inspection revealed the tail rotor force gradient assembly had separated at one end and partially fouled the tail rotor directional control linkage.

The crew's superior coordination and accurate responses throughout the flight resulted in the flawless execution of a difficult slide landing, saving a valuable AMC aircraft and crew.

WELL DONE! ■

Be honest...

**Can you
perform as
certified?**

**Lives depend
on your answer!**