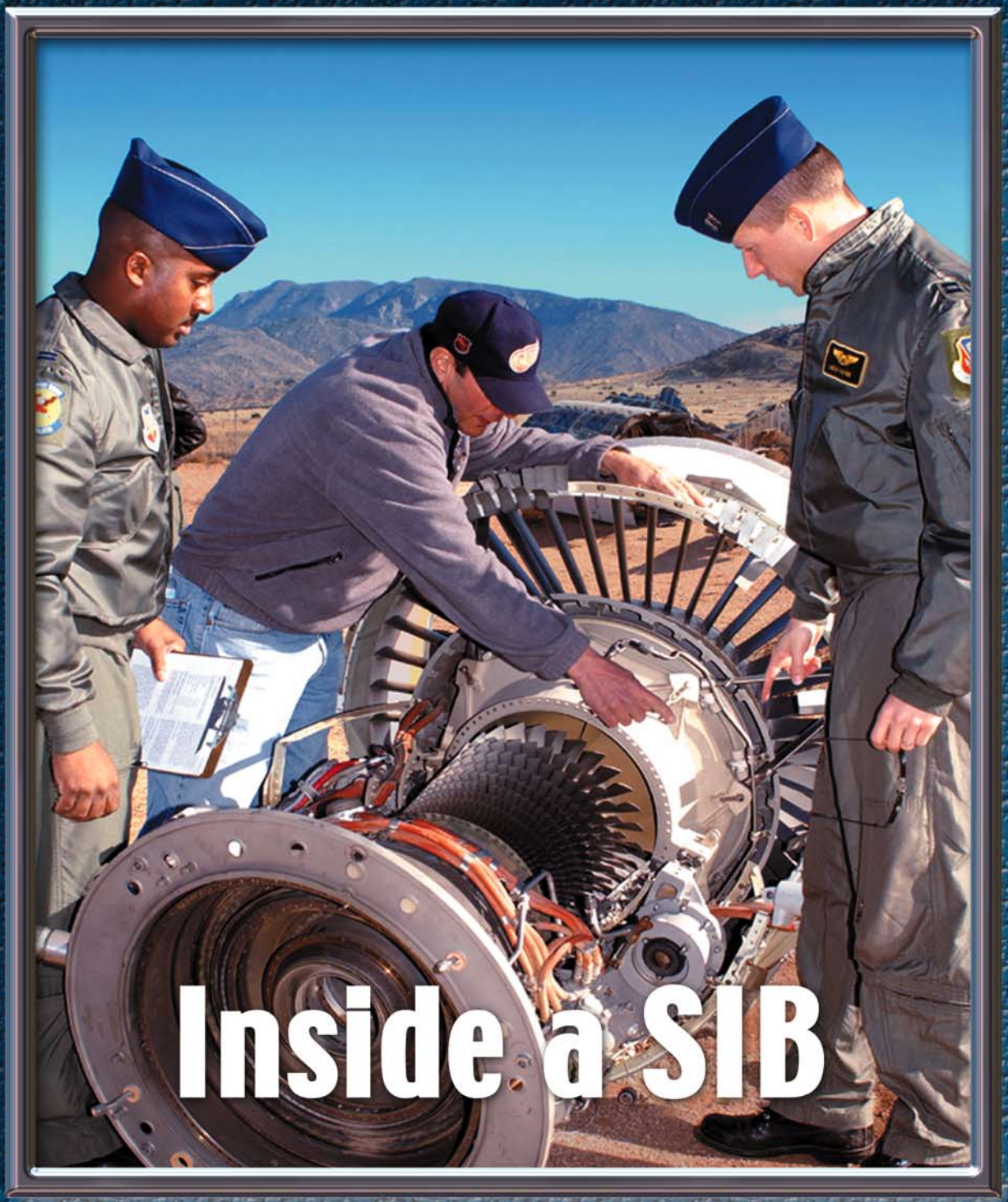
UNITED STATES AIR FORCE
FSM
FLYING SAFETY MAGAZINE
JUN 2004



Inside a SIB

FSM
FLYING SAFETY MAGAZINE

AIR FORCE RECURRING PUBLICATION 91-1

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Flying Safety Magazine on line: http://afsafety.af.mil/magazine/htdocs/fsmfirst.htm

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U.S. AIR FORCE

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SAFETY SAGE

25th National Aerospace FOD Prevention Conference
July 27-29, 2004—Hilton Atlanta Hotel, Ga

Fellow maintainers and aviators, the annual FOD conference is here once again. The conference objective is to make the aerospace industry aware of the need to prevent foreign object debris/damage from our aviation/ aerospace vehicles, airports, runways, manufacturing shops, flightlines and all aspects of aerospace operations. The conference provides an effective forum for the exchange of ideas, solutions and expertise, and is a key resource for information, training and support.

Who should attend:

Anyone who has an interest in flight safety—that is most maintainers. This conference attracts major industry representatives from: airlines, airports, cargo haulers, aircraft manufacturing and repair, military, space, support industries, and many others from aviation organizations.

Conference Program:

NAFPI and this year's co-hosts invite everyone to come to Atlanta and take part in the 25th National Aerospace FOD Prevention Conference to see the latest FOD prevention techniques, equipment and technological advancements used in the industry to prevent FOD, promote awareness, and combat a common enemy. There will be three days of facilitated panel discussions, keynote presentations, interactive learning sessions (workshops), benchmarking tours, and exhibits. Attendees will share proven methods and best shop practices of preventing FOD throughout the aviation/aerospace industry.

To register, go to the NAFPI website (http://www.nafpi.com/index.htm). *Flying Safety's* CMSgt Jeff Moening has attended the last three conferences, and this is a great learning and networking opportunity.

DEPARTMENT OF THE AIR FORCE — THE CHIEF OF SAFETY, USAF

PURPOSE — ***Flying Safety*** is published monthly to promote aircraft mishap prevention. Facts, testimony, and conclusions of aircraft mishaps printed herein may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. The contents of this magazine are not directive and should not be construed as instructions, technical orders, or directives unless so stated. SUBSCRIPTIONS — For sale by the Superintendent of Documents, PO Box 371954, Pittsburgh PA 15250-7954. REPRINTS — Air Force organizations may reprint articles from *Flying Safety* without further authorization. Non-Air Force organizations must advise the Managing Editor of the intended use of the material prior to reprinting. Such action will ensure complete accuracy of material amended in light of most recent developments.

DISTRIBUTION — One copy for each three aircrew members and one copy for each six maintainers and aircrew support personnel.

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Safety Q&A With Senior Leadership

USAF Photo by:
SSgt Corey Clements

GENERAL JOHN W. HANDY
Commander, Air Mobility Command

(Editor's note: This is the second in a series of interviews on safety with senior AF leaders.)

FSM: As you serve as Commander of AMC, what are your priorities as far as improving our safety efforts?

I can't over-emphasize the importance of risk management, be it personal or operational. Most of our losses are the result of individuals making poor decisions and taking unnecessary risk. Effective use of risk management tools and techniques is the key to individuals making the best decisions at work and at play. The 50% mishap reduction challenge is achievable. Preserving people's lives and other resources is always a priority and absolutely essential to successful mission accomplishment. We have a vibrant safety program with energetic professionals managing it; however, there is still room for improvement.

FSM: What do you believe we as AF members can do to improve our safety record in flight safety?

We absolutely have to follow the rules! Most of our operational missions are long and monotonous with intermittent periods of intense and precise actions required. I equate our flying environment with that of a NASCAR race. We're flying long missions just as the race driver is driving a four- or five-hundred-mile race around the same track. The scenery doesn't change for either of them. Neither can allow their situational awareness to lapse. Neither crew can afford to allow complacency to enter into the mix or they will lose their position in the race or the aircrew will fail to meet their mission or worse yet, lose their aircraft. Other similarities involve the supporting crews: racing pit crews and our ground servicing crews. Each are fine-tuned teams that spring into action using tried-and-true procedures to keep the car in the race or the jet in the air. Both continuously practice those procedures to maintain precision and reinforce their confidence. Complacency on either crew's part will lead to tragedy.

FSM: What do you believe we can do to improve our safety record in POV mishaps?

A cultural change must take place, starting with leadership and at the pointy end, the driver. Years past, "drive defensively" was a common buzz phrase, and it's still appropriate. An even more appropriate phrase for today's traffic environment is "drive patiently." The craze for speed and our own impatience are responsible for the creation of

"road rage." Before we respond inappropriately to another driver's action, we need to ask ourselves what value our reaction will really have. Driving patiently can be defined as allowing others to merge into our lane, stopping for yellow lights rather than speeding through, obeying speed limits and adjusting for weather and road conditions. Supervisors must take time to gain a complete picture of their worker's attitudes toward their job and off-duty activities. Known risk takers should understand they're being watched and their risky behavior can impact more people than just themselves. Individuals who are risk takers in their POVs are more than likely risk takers in their other activities. Commanders and supervisors should leave them with no doubt that reckless behavior will not be tolerated and when called for, disciplinary measures will be taken. Senseless vehicle mishaps are costing us dearly in lost manpower, not to mention the emotional strain those losses put on duty sections and the families. At-risk behavior must be identified and dealt with before tragedy strikes.

Most of our losses are the result of individuals making poor decisions and taking unnecessary risk.

FSM: What special safety concerns are posed by our war efforts?

We're doing a great job of ensuring our troops are prepared to face a known enemy. In the war environment we're far more conscious of our surroundings and our situational awareness is sharper. However, once back in a peacetime environment we're dropping our guard and making poor decisions, often resulting in fatal consequences. Losses to combat are always a possibility because we have an opponent trying to inflict damage. The losses that we're suffering outside the war zone are harder to understand or accept. Leadership at all levels has to continue to emphasize the importance of situational awareness and the employment of sound risk management both inside and outside the war zone.

FSM: Speaking of our war efforts, do you see any special concerns with the support side of aviation—our maintainers, weapons, security, supply, transportation and the rest of the Air Force?

Our non-flyers are experiencing the same hardships that the flyers are. The OPSTEMPO affects every person wearing the uniform and our civilian co-workers. Our professional support personnel, regardless of their specialty, are absolutely essential for us to accomplish the Air Force mission. In my visits to our units around the world I see professionals doing jobs that we both are proud of. No one wants to be separated from their loved ones but we're all professional Airmen with a job to do and we do it proudly. Separation-extended hours-harsh environments—doesn't matter!

FSM: What role do you believe supervisors and/or co-workers play in ensuring our Air Force works and plays safely?

We are our brothers' keeper! Flyers call "knock it off" whenever they sense something isn't right, and we all need to use that same sense of responsibility when we see or feel that something isn't right. I won't put myself in harms way by riding with someone who recklessly disobeys the law or accepts needless risk. I expect everyone in this command to follow my lead in that area. Supervisors must be fully familiar with their Airmen; know their interests and show genuine concern for their health and well-being after duty hours, just as they

USAF Photo by: TSgt Jim Varhegyi

do when on duty. Supervisors should call "knock it off" when they learn one of their subordinates is considering engaging in a high-risk activity and ensure that "personal risk management" is exercised before they engage in the activity. As I stated earlier, troops returning from deployment are particularly vulnerable to dropping their guard once they're back on familiar ground. We know who the enemy is when we're deployed, but that's not necessarily the case when we're back home. Curiosity killed the cat; complacency can kill us.

FSM: What role do you see ORM playing in our on- and off-duty safety efforts?

An absolute must! Engaging in any new activity, whether work or play, requires taking time to identify and analyze the risk associated with that activity. It's not complicated—it's common sense, and if something doesn't make sense, then we shouldn't be doing it. Off duty, the decision authority for risk is the individual. On duty, the decision authority escalates with the risk. We as a command have and will accept additional risk in the GWOT. But we have drawn the line very clearly whenever the situation just doesn't make sense.

FSM: What do you see as the greatest safety problem with reference to off–duty activities?

Not recognizing our limitations and accepting unnecessary risk! I've read too many PMV mishap reports that identified the drivers overextended their capability to stay focused, tried to go too far, too fast, and paid the ultimate price. Inexperienced motorcycle operators riding beyond their capabilities. Many will argue that we don't know what the limits are until we've exceeded them, but I know when I'm reaching the limit of my ability, because I begin to feel some apprehension. That little bit of apprehension is my own conscience telling me that I'm about to move beyond my comfort zone. Heeding those apprehensions or caution lights is not a sign of weakness. On the contrary, ignoring them could quickly place one in a non-recoverable situation. Most mishaps, both on and off duty, have many individual "caution lights" or pre-cursers which lead to or affect the outcome. Had some of these caution lights been considered, analyzed, and behavior altered, the mishap either would not have occurred or it would have been less severe. Unfortunately, each mishap also has a point, which once crossed, the mishap sequence becomes self-sustaining and we're helplessly along for the ride—the outcome is inevitable. Call it overconfidence or complacency but no matter what label is used, too many people are getting hurt or killed because of failing to heed their "caution lights."

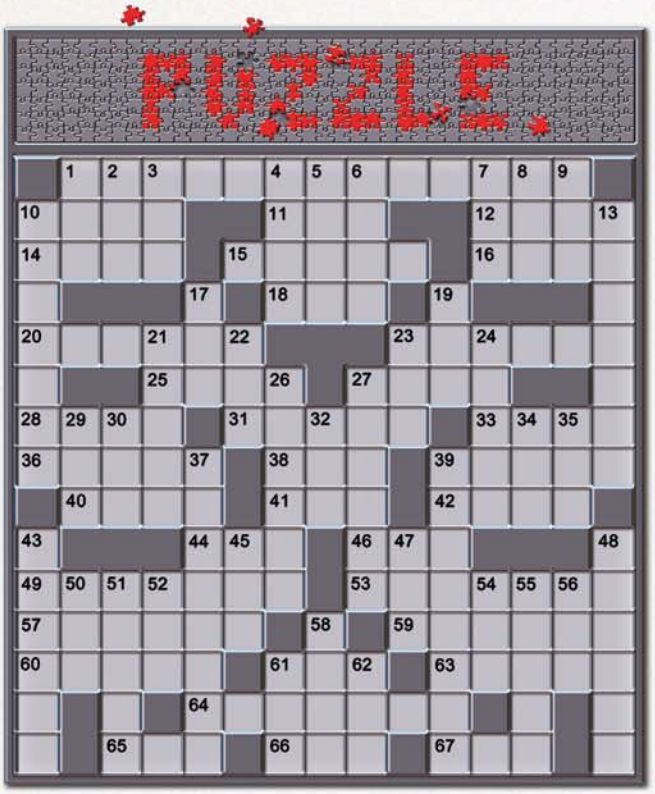
FSM: When you have completed your tour as Commander of AMC, what would you like to have accomplished?

First, as Commander of AMC I'm both humbled and proud to have served in this capacity. AMC has made phenomenal accomplishments during my tenure and continues to do so daily. The legacy I'd like to leave this great command is one where each member fully recognizes that they ("the individual") are the most crucial element that makes AMC great and that each individual has a direct influence and stake in the successful accomplishment of AMC's global mission. Our country, other commands, other services, and other nations depend on AMC daily to fulfill its Air Force role. People are the heart and soul of AMC. My most singular personal accomplishment will be if AMC surpasses the 50% mishap reduction goal in FY05. We'll pass the goal if we all make personal risk management a way of life. ★★★★

USAF Photo by SSgt Corey Clements

Aircraft Mishaps

By 1LT TONY WICKMAN
Alaskan Command Public Affairs



ACROSS

1. Loss of this can cause an aircraft mishap
10. Was attired in
11. Army equivalent to enlisted report (abbrev.)
12. Measurement for 61 ACROSS
14. Fencing sword
15. Estimate
16. Lymph ____
18. USAF commissioning source
20. Pilot action to avoid an aircraft mishap
23. Contributing factor in aircraft mishaps
25. Actor Sharif
27. Lode
28. British school
31. Sap
33. Items that must be checked to avoid aircraft mishaps
36. Actress Zellweiger
38. ___ Alamos, N.M.
39. Arm bones
40. Cheers patron
41. The Greatest
42. Arizona town
44. Japanese sash
46. Sphere
49. What pilots have done during aircraft mishaps
53. Recount
57. Papaya meat tenderizer
59. ____ the Menace
60. Type of acid in the body
61. Bar order
63. Central Hawaiian island west of Maui
64. What Sajek might say on Wheel of Fortune (two words)
65. ...–––...
66. Flying expert
67. USAF enlisted PME

DOWN

1. Person portrayed on NYPD Blue
2. Exist
3. Something in a bonnet?
4. Currency in Tijuana
5. Crew ____ ; a factor is aircraft mishaps
6. Significant periods
7. FOX rival
8. ___ de Janeiro
9. Terminate
10. Significant contributor to aircraft mishaps
13. Ties down
17. Faint
19. Hawaiian gift
21. Printer need
22. Ground transport
23. Female chick?
24. ____ of attack; possible cause of aircraft mishaps
26. Put seed down again
27. Factor is aircraft mishaps
29. X
30. Beatle John's wife
32. Monetary unit of Peru
34. USN O-1
35. Auto club
37. Possible contributor to aircraft mishaps
39. Rain cover?
43. Necessary thing to do to aircraft before/after mishaps
45. Big ___; famous clock in England
47. A unit of energy absorbed from ionizing radiation
48. Flaws in this can lead to aircraft mishaps
50. Marmalade
51. The Iliad or The Odyssey
52. Able
54. Nucleic acid similar to deoxyribonucleic acid, in short
55. Nicole Smith or Paquin
56. Wayne's World Carrere
58. Condition that can result in aircraft mishaps (abbrev.)
61. Actress Gardner
62. Female sheep

The story of a rookie on an Interim Safety Board

What Do You Do Now?

USAF Photo by SSgt Jeremy T. Lock

ANONYMOUS

Last year when I deployed in support of the ongoing war on terrorism, one of my additional duties was as the alternate Flight Safety Officer. A couple of years earlier I had attended the Aviation Mishap Investigative Course and the Chief of Safety course, and I had operated as a group Chief of Safety for two years, so this additional duty did not seem too daunting. The deployment was going fine up until just prior to our return trip home. Then it happened: During a night mission, one of our aircraft crashed, killing all on board. For me, this was not the first time dealing with such a horrific circumstance. Just a few years before, a very similar incident rocked my foundations, and here I was living it all over again, but this time as the Safety Officer.

What I would like to accomplish here is provide safety professionals an after-action report for the week I served on an Interim Safety Board. I will primarily concentrate on two of the larger lessons learned, which include the interview process and the crash scene investigation.

During the night of the crash, I found myself going through our deployed mishap response plan checklist, including securing the mishap crew's training records, aircraft records and anything else dealing with the mishap mission.

At some point during the night I was identified as the Pilot Member for the Interim Safety Board (ISB). The next morning, after no sleep, I boarded a transport to a base closer to the crash site to meet with the ISB President. When I arrived, I found

the Board President was already at the crash site, and that he would not return for several hours. Due to the remote location, I was unable to get transportation to the crash site, so during that time I worked with the local command to set up the ISB office.

That morning, I also had an opportunity to speak with some of the crewmembers of the formation wingman of the crashed aircraft. Nothing formal was discussed; I just wanted to see that my friends were doing okay and if there was anything I could do for them. They had been through so much the night before. I found that the unit that was assisting me with the ISB office set-up was also taking care of my exhausted friends' every need. This unit was nothing short of extraordinary in their personal and professional support for me, the ISB and my crewmates. I will never forget their incredible assistance.

The ISB President showed up from the crash site later that afternoon. Without wasting any time, he decided to get started with the crew of the mishap aircraft's wingman. My first big lesson was to be learned, conducting the interview.

At this point, I was running on adrenalin fumes. I had never conducted an interview of this sort in my life, and was therefore very unsure on how to get started. Fortunately, the ISB President was very experienced in conducting safety investigation interviews and had developed a very complete format. Over the next five days, we used this format to conduct nearly 30 hours of interviews. The format of the interview is broken down into basic parts, one being informal and off-the-record (TAPE OFF), and the other being formal and on the record (TAPE ON). This is important in that the interviewer is able to put the witness at some level of comfort in knowing what to expect during the interview. His format is as follows:

TAPE OFF

1. Introductions of the Board.
2. Purpose of the Board (Interim *Safety* data collection).
3. Format of the Interview.
4. Discuss Privilege, and have witness read 91-204 Privilege statement.
5. Questions from the witness before proceeding.

TAPE ON

1. Formal Introductions. (Everyone introduced for the purpose of record keeping.)
   a. Reason for ISB.
   b. Date, Time, Location of interview.
   c. Members of Board.
   d. Have witness introduce him/herself, crew position, etc.
2. Board President Reads Privilege statement. Witness accepts/declines and signs statement.
3. Board President asks the witness to describe the incident from applicable beginning to a set ending period. Witness will then speak freely with no interruptions from the Board.
4. When the witness is finished, the Board President announces a break, and the tape will be turned off.

TAPE OFF

1. Witness offered a break for bathroom/smoke, etc.
2. Witness is asked to read any written statement he/she may have written earlier.
3. Board president again reviews the remaining agenda and asks if the witness has any questions/concerns and if he/she is ready to proceed.

TAPE ON

1. Board President does a quick re-intro of the ISB and the person that is being interviewed.
2. Board President mentions that the witness has had an opportunity to read his or her witness statement and asks the witness if there is anything he or she would like to add to what they had stated earlier. Witness is then given some more time to speak without any questions from the Board.
3. Questions from the Board: Board President asks questions followed by the rest of the Board in a pre-set sequence, i.e., IO, Pilot Member, Flight Doc, etc.
4. Board President asks for any alibi questions from the Board and comments from the Witness.
5. Board President reminds the Witness not to discuss anything about the interview to ensure his/her statements will remain confidential, lets him/her know that more interviews may occur in the future, and thanks him/her for assistance.

The first to be interviewed was the mishap wingman aircraft commander, who happened to be a friend of mine since I was a second lieutenant. We were both exhausted, as was the Board President, which made the interview format all the more important. The ISB President did a fantastic job putting both the interviewee and myself at ease; then we began.

The interview lasted about an hour and a half. From the start I could see the genius and simplicity of his format. Unfortunately, my learning curve was huge, and I found that I had made several mistakes. First and foremost, the ISB President pointed out, during a quick debrief following the interview, that some of my questions were very leading as to the answers I was looking for, which pretty much breaks rule number one when conducting a professional interview. Another mistake was not setting up an appropriate interview room. You could hear footsteps outside and doors slamming, and we were interrupted twice. Another huge lesson was that we had to borrow a video camera—and would you believe that WalMarts are not located everywhere in the world? We only had one tape! Folks, when you deploy, make sure you include plenty of batteries and tapes for whatever recording device you bring.

During that day, we again tried and failed to arrange transportation for me to get up to the crash site. Due to the threat in the area, the base commander wanted to pull out the troops that were guarding the crash site and destroy what was left of the aircraft. However, the ISB President and the Air Force component Commander were very adamant that I should be allowed to see the crash site. Although the ISB president had seen the crash site, he was not at all familiar with the aircraft, and he wanted my expertise to conduct a better investigation. The base commander reluctantly gave in, and as a result a company from the 82nd Airborne stayed in out in the field, with no shelter and in enemy territory, protecting the crash site for my arrival the next morning. The ISB President told me that I would get one hour at the crash site, and then it was to be blown up.

After conducting several hours of interviews, we broke for dinner, and then we spent the rest of the night reviewing digital photos that the ISB President had brought back from the crash site. From the photos, I could see the layout of the nearly 700-meter-long crash site, and I started to develop a plan for the next morning's investigation. Finally, after some 48 hours without sleep, I went to bed thinking about those troops out in the field waiting on me.

After three hours of restless sleep, I awoke and started getting ready. I briefed my plan to the rest of the board. I wanted the photographer to go with the ISB President and carefully catalog and photograph the crash scene. I had the Investigating Officer (IO), who was also not familiar with my airframe, to be in charge of ensuring the cockpit flight instruments were photographed and, if possible, recovered. I charged the maintenance member to investigate the engines and drive systems to search for any clues as to their status on impact. My first task was to head to the cockpit to assist with the IO identifying the cockpit, as well as review the switchology at the time of impact, and see if I could locate the aircraft's heads-down video recording device (the aircraft had no cockpit voice or flight data recorder). After that I intended to go to the impact point to record as much data as possible on how the aircraft hit the ground.

The 82nd Airborne stayed out in the field, with no shelter and in enemy territory, protecting the crash site for my arrival the next morning.

On landing at the nearly 9000-foot MSL crash site, the ISB President looked at his watch and said that I had one hour. So, we ran down to the site. The first section I came across was the tail. It almost seemed like I was back at the Kirtland AFB crash lab; parts and pieces laid out for me to put the puzzle together, and no disturbing human remains (the bodies had been recovered the night of the accident).

After about five minutes looking at the tail section, I remembered my own plan of action. So I headed up to where the cockpit lay. As I approached, I noticed a few deep red stains in the soil. I also could see several different pieces of torn, crushed and bloodied life support gear and asked one of the soldiers to collect them all. The next thing I noticed was that there was a huge pile of debris in one place and asked what had happened there. I was told that the soldiers had collected whatever they could and then piled it up for demolition.

Feeling a little frustrated at that news, I approached what I thought to be the cockpit to look at the flight controls and switches. I knelt down by the cockpit and found that it was only a few inches wide. Fatigue, anger and frustration set in, and I stood back up and kicked some rocks and had myself a swear-fest. During this tirade, I looked around at these tired, brave soldiers guarding this site. They were watching me, the so-called "expert," having a temper tantrum right in front of them. I paused, took a deep breath, said a quick prayer and continued with the investigation plan. As I left the cockpit and ran to the impact area, the engineers placed explosives on the cockpit while the ISB President called that I had 25 minutes left.

As it turned out, the point of impact provided us with the most clues as to what had happened two nights before, and I spent the next 20 minutes photographing and diagramming the site. One last time I ran the entire site, and then time was up. We boarded the helicopters and watched as the engineers blew the site up, then we departed.

The main lesson here was that you need to come up with a game plan for how you intend to conduct the crash scene investigation, then stick to it. Of course we ended up wishing that we would have done one or two things differently, but over all we did a pretty good job, given our extremely limited timeframe and the environment we were dealing with.

We spent the rest of the week cataloging the evidence and conducting interviews in several locations around the theater. Finally, six days after the accident, the permanent Safety Investigation Board arrived and we turned all of our data over to them. I was relieved when I was then released to rejoin my unit in theater.

It was a very terrible week and yet I had learned so much. I was truly honored to work with such an outstanding ISB President. He taught me his perfected interview technique, which I am sure I will put to use in the future. He also showed me the importance of maintaining my composure, while at the same time sticking with an investigation game plan no matter how difficult the situation.

USAF Photo by SSgt D. Myles Cullen
Photo Illustration by Dan Harman

The ISB president told me that I would get one hour at the crash site, and then it was to be blown up.

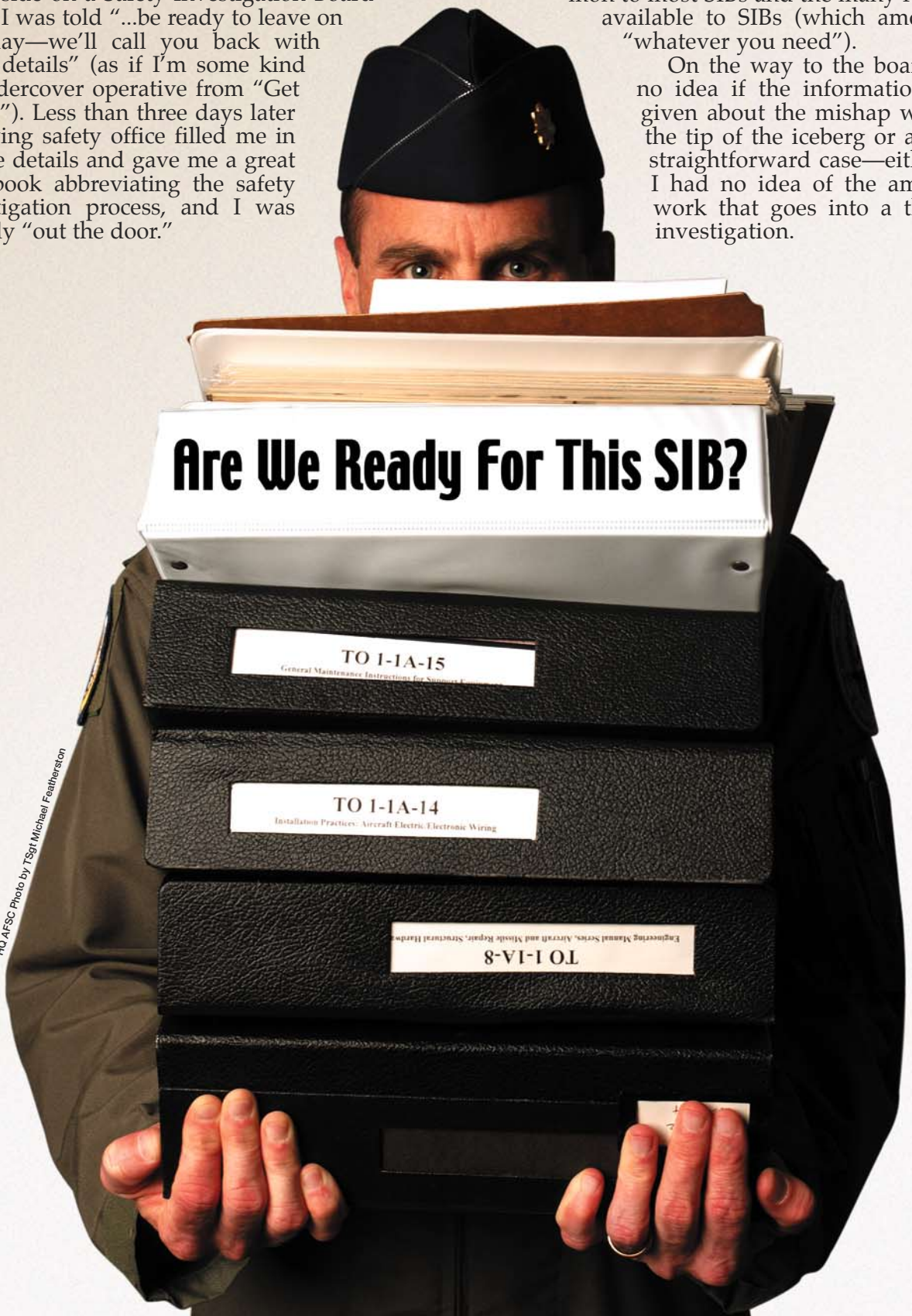
CAPT BRANDT L. HOUSE
91 ARS
MacDill AFB FL

Are We Ready For This SIB?

It's 9 p.m. on a Saturday night and Cedric 'The Entertainer' is just about to come on stage—so the last thing I expected was a call from my wing safety office telling me that I had just been selected to preside on a Safety Investigation Board (SIB). I was told "...be ready to leave on Monday—we'll call you back with more details" (as if I'm some kind of undercover operative from "Get Smart"). Less than three days later my wing safety office filled me in on the details and gave me a great handbook abbreviating the safety investigation process, and I was quickly "out the door."

As aircrew, we're expected to be prepared for most emergencies in our aircraft. The same might be said about flight safety officers (FSO) and SIBs—we should be prepared for a SIB investigation at anytime. No mishap will ever be the same, but the process by which we conduct every investigation should be the same. This was my first SIB and I was unaware of many of the pitfalls common to most SIBs and the many resources available to SIBs (which amounts to "whatever you need").

On the way to the board I had no idea if the information I was given about the mishap would be the tip of the iceberg or a simple, straightforward case—either way, I had no idea of the amount of work that goes into a thorough investigation.



HQ AFSC Photo by TSgt Michael Featherston

All the members of the board convened at a designated office at the mishap base: Board President—Commander of a reserve C-130 unit; Investigating Officer (IO)—C-21 pilot; Pilot Member—KC-135 pilot (yours truly); Maintenance Member—KC-135 Maintenance Officer; Flight Doctor—KC-135 unit flight doc; Board Recorder—WC-135 technician; and the Commander's Representative—KC-135 MXS commander from the mishap aircraft's home station. Only one of us had actual SIB experience (the recorder), none of us was currently holding an official safety position, and the last time any of us had attended an AFSC course was two years prior. It was easy to wonder, "Are we ready for this Safety Investigation Board?"

We entered the board room to see a group of exhausted faces who introduced themselves as the Interim Safety Board (ISB). They were more than happy to pass the reins off to us. The ISB conducted an in-depth changeover brief and then met individually with their SIB equivalent counterpart. We met our HQ AFSC representative on a conference call during the briefing. Overwhelmed with all the information, our first question was, "When is our HQ AFSC rep going to join us to help sort through all this?" When he told us that he wouldn't be joining us, the pressure in the room started to rise a little more.

The ISB passed all the information and materials acquired since the mishap to the SIB: initial interviews/statements, aircraft forms, aircraft materials (hydraulic fluid, oil, etc.), and pictures. The wing FSO did as much as he could to supply the SIB with as many supplies as he thought we might need, and made himself available for any time of the day or night (the board recorder was issued an IMPAC card for the SIB and was able to acquire supplies from places like Home Depot and Office Max). The ISB shook our hands and gave an empathetic 'good luck' as they walked out the door. The HQ AFSC representative politely said "...call me if you need anything."

With the room suddenly silent, we had an IO who attended FSO school six years prior, a maintenance officer who, like myself, had arrived with a modest AMIC education, and none of us with actual experience on a SIB. The IO used the first day to set a plan of action for our approach to the investigation with the first and most important step being "...refresh yourselves on AFI 91-204 tonight." A review of AFI 91-204, *Safety Investigations And Reports*, and AFPAM 91-211, *USAF Guide To Aviation Safety Investigation*, prior to attending is a good way to prepare for the SIB. (Editor's note: See also AFM 91-223, *Aviation Safety Investigations and Reports*, on the Forms & Publications page at http://afsafety.af.mil/.)

We soon recovered from the fire hose of information thrown at us and began to get the ball rolling with a lot of calls to our HQ AFSC representative and a learn-as-you-go attitude. For example, we quickly realized the time and effort that goes into transcribing interviews (eight hours of transcription for every hour of testimony). We requested additional members to assist the board recorder with transcribing. As we became more familiar with the mishap, we understood that we didn't have all the knowledge we needed to accurately determine the cause; we brought in additional specialized maintenance members from other bases to help. When we had to send one of the mishap aircraft's systems to depot, we were able to send our Maintenance Officer with it to get face time with the engineers—that allowed us to get a little more attention and focus on our issue.

The Board President decided to dismiss the board and reconvene two weeks later when the engineers informed us that the results from their test would not return for a couple of weeks. The break also allowed the board members to stay friendly with one another—tensions can get high when debating about mishap events in a small room day after day (if everyone would have agreed with me, it might not have been so bad).

As broad as an investigation can be, it suddenly becomes very tedious as we began to close it out. We found that a computer for each of the board members is a must as we all began to fine-tune our sections of the report. The board recorder had already earned his money coordinating logistics, transportation, and computer setup, but his workload was magnified exponentially when it came to compiling the final report. His job was slowed extremely by a low quality printer and scanner (must-haves for the board recorder).

As it turns out, we were ready for the investigation. The key in the beginning was the IO setting up a plan of action for our approach to the investigation. The IO started every morning with objectives for the day and a summary of our work at the end of the day. He placed emphasis on staying focused on the cause of the incident—it isn't hard to be distracted by non-factors. We quickly learned that if we thought we needed something, we had only to ask for it. The host base was more than accommodating, and no demand was too big. A periodic break from the investigation will, no doubt, be welcomed by all members after several straight days of confinement in the board room.

One point not mentioned above was report writing (eight-hour, 72-hour, 15-day, and final). It should be emphasized that no report should be delivered by the board without a review from each member on the board, if possible. Don't underestimate your ability to create and send a report that embarrasses everyone on the SIB.

As I mentioned earlier, no mishap will be the same, but there will be one constant for all boards: The success of the board depends upon the extraordinary effort of all members of the SIB and the added effort and support of a lot of offices and agencies outside the SIB conference room.

Are you ready?

SUPERVISION

THE KEY TO SUCCESS

USAF Photo by SSgt Derrick C. Goode
Photo Illustration by Dan Harman

CAPTAIN GORDON BEST
SO3 Pubs, DASC
CAPTAIN KEV MADDISON
RQHI 3 Regiment AAC
FLIGHT LIEUTENANT ROBBIE LEES
UFSO 33 Squadron RAF

Courtesy UK *Aviate*, Winter 2003

(Editor's note: This article from our British friends talks about some of the operational problems which coalition forces have encountered in the AOR.)

In terms of flight safety, Op TELIC was a success from both the 3 Regiment AAC and 33 Squadron RAF perspectives. Fortunately there weren't too many scare stories, due in part to the extensive preparation carried out both pre-deployment and on work-up training in theatre. Notwithstanding that, many of the old problems regarding desert operations were re-visited and some new ones identified.

WEATHER

Bad weather was a continuous problem, mainly manifesting itself as blowing dust that could stay in the lower atmosphere for up to four days. The extremes in temperature differential between daylight and night-time came as a shock to some people; however, it was fortunate that most had time to acclimatize. This reduced the problem but could not remove it completely. Some tasks meant that crews were sitting out in the desert for hours with no shelter but the aircraft. In such cases it was important to carry a lot of water (a case of bottled water was established as essential role kit on each aircraft). Signs and symptoms of dehydration were well publicized both pre-deployment and continuously as the operation unfolded; together with resting in the shade whenever possible crews successfully avoided any heat injuries. The effect of extreme temperatures on aircraft performance was expected and suitable techniques adopted to compensate for the slim power margins available. However, the unpredictable nature of the surface wind, especially when associated with local storms, brought many problems. One such storm saw an American maintenance tent blown 200 metres onto a Lynx helicopter causing extensive damage, even bending one of the titanium rotor arms!

FATIGUE

Although there were no injuries, which could be solely attributable to the heat, it was recognized that the high temperatures contributed signifi-

cantly to fatigue. This was a major issue during the 'war fighting' weeks and a number of initiatives were put in place to counter the problems. 33 Squadron RAF had eleven crews to provide ten duty lines as well as a duty authorising officer. Four of those duty lines were night duties, meaning crews had to rest during the day in temperatures up to a recorded high of 48°C (an almost impossible task!). Because there was no flexibility in the manning, there was no down time and crew changeovers invariably could not be made at 'convenient' times. This was a major issue to deal with and it was tackled two ways: Firstly, a sound supervisory chain was established, which closely monitored which crews had been working the longest hours and which ensured that suitable forward planning initiatives were adopted. Secondly, there was a genuine atmosphere where crews could turn round and declare themselves too tired. It is interesting to note that the proactive supervisory chain ensured that the second method was very rarely utilised.

There was a genuine atmosphere where crews could turn round and declare themselves too tired.

LOW FLYING

Due to the obvious hostile threat levels and battle space restrictions, the low level environment was a tricky place to operate. Normal hazards associated with low flying were complicated by the relatively featureless terrain, which was generally flat, with few natural vertical obstructions. In many ways, unfamiliarity with the new hazards was a far more dangerous issue. The 'flat' terrain had numerous gentle undulations and hidden ridges that could prove to be problematic, particularly in hard turns at low level. The lack of texture often made height judgment difficult by visual cues alone. In conditions of reduced visibility due to moisture or sand there was often little distinction between the sky and ground.

Finally there were numerous man-made vertical obstructions. Many pylons, having been destroyed during the Coalition Air Offensive, had wires hanging in unfamiliar positions and some were missing altogether. This risked the complacent assumption that wires which could not be seen, were in fact not there. The locals had attempted to restore power by stringing makeshift cables between pylons. Two Army Air Corps helicopters suffered wire strikes during the campaign, one as a result of being snagged on an unseen wire dangling from a nearby downed pylon. Training proved to be the way to reduce these risks and all crews concentrated in mastering safe low flying techniques in theatre.

COMMUNICATIONS

Communications in theatre were extremely poor. All radios proved to be unreliable and airborne stations were often difficult to contact; satellite phones were not carried as a standard aircraft fit which meant that flight following was not usually possible. Commanders had to constantly adjust the risk threshold to take into account the flight safety and operational factors involved. The issues associated with flight following are still proving to be a major concern to operators in the region even today.

TRAFFIC DENSITY

During the build-up of forces in Kuwait the number of aircraft increased to over 1,000 helicopters all operating below 500 feet AGL. There were no laid down procedures for de-confliction on main routes and choke points. The only sure way to reduce the risk of collision was *look out*.

The risk of collision was not just a problem whilst airborne—between aircraft dispersals and visual departure and arrival point at Ali Al Salem, the main camp road crossed the taxiway and not all vehicles were aware of the need to give way to aircraft. Prompt action saw the road closed and traffic diverted but this highlighted the need for vigilance at all times.

QUALITY CONTROL

The increased flying rates were matched by the equally high engineering workload. Difficult working conditions required the adherence to a structured supervision and quality control system. One particular engineering problem was dealing with the effects of sand erosion of both rotor blades and engine compressor blades. It was necessary to detail specific engineering teams to be responsible for keeping a lid on the ever-increasing problems associated with component parts being effectively sandblasted.

SUMMARY

Operations flying inherently carried more risks than peacetime operations. Those risks had to be quickly identified before they created incidents/accidents. Although task achievement was paramount and a high degree of risk accepted, continuously balancing priorities was critical to safer operations. The effects of the temperature and fatigue were probably the greatest everyday concerns, but a combination of sound supervision and awareness ensured that they remained theoretical risks. A sound pre-deployment training package coupled with a continuous effort to increase experience levels in theatre also proved invaluable.⊙


CFIT
Don't let the last thing on your mind
...be your behind!

USAF Photos
Photo Illustration by Dan Harman

An Incredible Experience

USAF Photo

CAPT TRAVIS D. WALTERS
89 FTS/SE
Sheppard AFB TX

The black smoke ascending from the runway was unforgettable. I stared out the window in disbelief, fixated on the increased activity outside. The jet could not have been airborne for more than a few seconds before impacting the ground. My fascination soon turned to grave concern as I thought about the crew. Maybe one of my buddies was the T-38 instructor pilot in the jet. Did both pilots make it out in time?

The events transpiring around me cut my reflections short. While I had only ten minutes left in my T-37 duty desk officer tour, I now planned on staying past my appointed departure time. The supervisor of flying called to change the flying status to "stop launch." A host of other phone calls came through including the relieving "two good chutes" report from the runway supervisory unit. The T-38 squadron commander and members of his staff hurriedly gathered data and answered phone calls from their own duty desk next door. Before long, senior officers at multiple levels had taken the appropriate response steps, and my minor role in the mishap was complete...or so I thought.

Within a few days, we began flying operations again. After returning from a student sortie, I received that ever dreaded "go see the squadron commander" message. When I saw him, he asked me if I would serve as a recorder on the T-38 mishap Safety Investigation Board (SIB). I hesitated. Thirty days of no flying. Thirty days of twelve-hour days including weekends. Thirty days of being a glorified secretary. Thirty days of…

"Yes sir, I'll be happy to do it," I said, regretting the words immediately after they left my mouth. What did I know about SIBs? Don't the wing safety officers handle things like this?

Uncertainty filled my mind as the wing safety office secretary gave me a rather large SIB recorder continuity book. "You'll be the first one in and the last one out every day. You won't believe how much work this will be," she said. She then informed me that the Interim Safety Board (ISB) set up operations on the other side of the base, and that it would serve me well to immediately familiarize myself with their operation before the handover. After a quick trip home to tell my wife the news, I paid a visit to ISB central. When I walked in the room, I could not believe what I saw. Flying equipment, maintenance records of all kinds, and seemingly insurmountable stacks of other paperwork covered the floor and lined the walls. I noticed a handful of ISB members tackling the arduous task of organizing all the "evidence"…a job I would inherit in a few short days. I spent the evening immersed in SIB regulations and checklists. Soon other SIB members would arrive. If I could stuff enough information in my cranium, maybe I would not sound like a buffoon when the Board President showed up.

Fortunately, I survived the first few days after the other members arrived, despite my extremely limited safety knowledge. However, that knowledge soon expanded. As days turned into weeks on the SIB, I learned a great deal about SIBs and safety in general. Although I gleaned much useful information from the board, those thirty days meant a great deal more to me than just gained knowledge. My SIB experience changed the way I execute the flying mission.

While many aviators receive eye-opening experiences in the air, my feet were planted firmly on the ground during the entire board. Still, serving on the SIB made me take a scrupulous look at the way I did everything before, during and after my flying missions. My assessment started with every piece of paperwork the wing keeps on me as an instructor pilot. Although I've usually had a good handle on currencies, FCIF cards, and required training, I now take extra time to keep track of these items personally. The SIB conducted a detailed examination of all the pilots' documentation. Was the most recent monthly boldface correct? How many times

had the instructor flown in the past several days? Did both pilots sign off their FCIF cards? Then came the medical records. Did the pilots have approved medical waivers? Were they medically cleared to fly? Not only did the board look at all the medical files, but the SIB also investigated both pilots' 14-day histories. Did the pilots have adequate crew rest? Did they have any personal issues that might detract from their flying duties? Before I ever step to fly a sortie these days, I ask myself if anything has happened to me recently that would raise eyebrows on a SIB. And the mission briefing hasn't even started yet!

The SIB also attempted to reconstruct a detailed account of the mission itself from start to finish. When did the pilots report for duty? What other duties did the pilots perform before this sortie? What did the pilots talk about during the briefing? Anything unclear in the brief might lead to a number of problems inflight. Some of my students in the past received a very abridged version of "the motherhood." They've heard it all before, right? When I brief a student now, I make sure I give a solid briefing to include emphasis on special interest items. I also now take time to write down applicable information on my line-up card. As the SIB recorder, I spent half an hour taping together pieces of the pilots' line-up cards!

Despite the already intense inspection of the events leading up to the flight, the SIB spent more time examining the flight itself. Did the pilots notice anything unusual on the walkaround? How thoroughly did they check the forms? Did the pilots follow all checklist procedures for start, taxi and takeoff? Did the pilots do anything nonstandard during the flight? When it comes to accomplishing walkarounds, ground checklists, and operations checks, I sometimes find myself suffering from that disease called complacency. Flying up to ten sorties a week in a training environment causes these important procedures to become mundane at times. However, for me, the vivid memory of detailed interviews with the pilots, crew chiefs, and mishap witnesses cured me of this ailment. Would I enjoy telling my fellow aviators that I just wasn't paying attention when the student started the engines? How would I answer questions about taking incorrect action in the jet because of my ignorance of the regulations? Could I stand to tell a full bird Colonel (or Brigadier General) Board President that I simply forgot to perform some of the routine operations checks during my sortie? The remembrance of vast resources and personnel completely dedicated to finding out what went wrong on a single flight keeps me vigilant in the air today.

Attention to detail. In a few short words, that's what the SIB taught me. As a military aviator, there's no excuse for me not to be disciplined about my profession, both on the ground and in the air. The purpose of a SIB is solely mishap prevention, and those 30 days showed me how serious the US Air Force is about safety and saving lives. My life isn't worth a few moments of negligence or ignorance. I daresay yours isn't either.

My SIB responsibilities were extremely enriching, to say the least. Not only did I get a chance to critically evaluate how I did my job, but I also reaped tremendous knowledge from more senior ranking board members. I also learned a great deal about career fields outside of my own. Despite the daunting task set before us, we even had a little fun along the way.

To those who served with me for those 30 days in the fall of 2003, thank you for making me a better officer.

And those others reading this, I say: If you ever get selected to serve on a SIB, don't go kicking and screaming like me. Maybe, just maybe, you too might have an incredible experience.

USAF Photo by SSgt A. Taninggo

Attention to detail, that's what the SIB taught me.

HIGH NOON WITH A SECTION OF TALONS

USAF/USN Photos/Photo Illustration by Dan Harman

LT MICHAEL S. GARRICK, USN
VAQ-134

In July 1997, I was over halfway through the advanced syllabus at Kingsville. Just when I thought I was going to be stuck doing all my low-level flights in southern Texas, I managed to get a cross-country to an airshow up north. On leg two of the three-leg return trip to Texas, my instructor and I planned to launch out of Tulsa International and fly the VR 1140 on the way to NAS Dallas. The weather guessers had forecast thunderstorms west of the route, but the weather picture looked workable, so we decided to press. Just before walking to the jet, I called the scheduling activity, to confirm that we still had the route scheduled. The voice on the other end of the line gave me the okay when I asked him if he had our "Blazer" call sign on file.

We took off and headed west-southwest to point B on the route. As expected, ATC had to vector us around some cells on the way to the alternate entry point, but we managed to get to VMC. After making the call to Flight Service, I descended down to 500 feet and accelerated up to 360 KIAS, the pre-briefed airspeed for the route. As we were a bit fat on gas (a circumstance seldom experienced in the Goshawk), my instructor had told me I could push up the airspeed from the IP to the target, provided my timing looked good. The route was nothing spectacular, but it was still far more scenic than anything in the Kingsville area.

They say that even a blind squirrel finds a nut, and as we crossed over the lake at point G, it seemed that I had somehow managed to stick pretty close to the timing. Anticipating the call from the backseat, I pushed the throttle to the max stop for the last leg. Out of the nearly 90-degree turn, I did a quick scan of the instruments and trimmed out the airplane. I was about to report my instruments to the instructor, when I noticed a black spot up ahead on our altitude. In the blink of an eye, the spot became two distinct aircraft flying a tight combat spread. By the time the realization hit me that we were beak-to-beak with the section, I had already bunted the nose. As we split the formation down the middle I recognized them as T-38s. The RADALT, which was set at 450 feet, was now blaring away in my ear. My instructor, who had been quiet up to this point, was frantically screaming at me on the ICS.

"What the $%*# are you doing?" he demanded. The only reply I could manage was, "Didn't you see those two T-38s?" as I climbed to the top of the block and started to slow down. A long silence ensued, followed by, "What T-38s?" As I explained to him what had happened, I could sense his mounting anger. Still in shock from the near miss, but no worse for the wear, we recovered uneventfully to NAS Dallas. My instructor's first call was to the originating activity, 80 FTW at Sheppard. I wasn't in the room when he called, but I could hear him all the way down the hall in flight planning. As it turned out, a foreign squadron was temporarily using the number listed for the scheduling activity in the AP/1B. The guy I had talked to spoke English well, but he hadn't had a clue about scheduling the low-level—he had just faked it. The VR-1140 is the reverse course of the VR-1139, and without knowing it, the route had been co-scheduled.

And the moral of the story? It wasn't a breakdown in planning or an error in judgment that led to this hairy situation. The sky simply is not that big, particularly in the low altitude environment. We could have just as easily encountered a bug-smasher piloted by a retiree with questionable eyesight that day, as a section of jets. Luck is no substitute for a good visual scan. Keep your eyeballs peeled…

Military Aviation Fatigue Countermeasures Workshop

USAF Photo/Photo Illustration by Dan Harman

The Air Force Research Laboratory and the Air Force School of Aerospace Medicine are again offering the Military Aviation Fatigue Countermeasures Course on 25-26 August 2004 at Brooks City-Base in San Antonio, Texas. The course instructors, John A. Caldwell, Ph.D., J. Lynn Caldwell, Ph.D., and James C. Miller, Ph.D., CPE, give the following information on the course:

Fatigue is being recognized increasingly as a threat to both productivity and safety in a variety of settings including aviation. In general terms, it has been estimated that fatigue-related problems cost America more than $18 billion a year in terms of lost productivity, and it is clear that fatigue-related drowsiness on the highways annually contributes to over 1500 fatalities, 100,000 crashes, and 76,000 injuries.

In addition, there is mounting evidence that pilot/aircrew fatigue is a causative factor in many civilian and military aviation mishaps. Although the first accident officially attributed to fatigue occurred only recently (the 1993 crash of a DC-8 in Guantanamo Bay, Cuba), there have been others since that time. In 2000, fatigue was implicated in the 1997 crash of Korean Air Flight 801 in which 228 people were killed. In January 2002, the National Transportation Safety Board ruled that fatigue was a causative factor in the fatal runway accident involving American Airlines flight 1420. Meanwhile, fatigue has been identified as a contributing cause in 9.6 percent of all Air Force Class A mishaps over the past 30 years, and aircrew fatigue has been associated with approximately four percent of all Army Class A-C accidents during the period from 1990-2000.

Because of statistics like these, substantial resources are now being focused on understanding the nature of this insidious safety hazard and the strategies that can effectively combat fatigue-related problems in operational contexts. Such efforts coincide well with Defense Secretary Donald Rumsfeld's recent emphasis on reducing military mishap rates by 50 percent over the next two years.

This fatigue-management course will outline the importance of addressing fatigue as a danger in military aviation, the basic physiological mechanisms underlying fatigue, and the most common causes of fatigue in military aviation operations and in other settings. In addition, the course will present ways to recognize fatigue in operational environments, and it will provide information about the relative efficacy of various fatigue countermeasures for aviators, maintainers and controllers.

Specific information will be provided about the importance of obtaining adequate daily sleep, the significance of establishing proper work/rest schedules, and the utility of strategic napping, rest breaks, circadian-entrainment interventions, stimulants, and other techniques. Participants will be provided with hard copy materials that summarize the topics discussed as well as reference bibliographies that can be used to obtain further information on specific issues. In addition, course attendees will receive instruction on the use of the prototype of the Fatigue Avoidance Scheduling Tool (FAST™), a user-friendly computer program that helps to optimize the work/rest schedules of operational personnel. Some attendees will desire to conduct applied fatigue research projects at their home installations. Thus, the course will conclude with a brief review of some recently-completed, operationally-focused studies and a brief summary of important research design and implementation issues.

This workshop is aimed at military personnel with a basic understanding of the problem of fatigue in operational environments, and/or those who are anticipating new duty assignments in which they will bear some responsibility for the alertness management of aviators, maintenance crews, controllers, or other personnel. No prior education in fatigue management, sleep, or circadian rhythms is required, but some general experience with the complexities of military operational settings is desirable.

Specific course topics will be the same as those in the April course (see the March 2004 issue of *Flying Safety*).

The cost of this course will be $120, with an additional charge of $50 for those desiring CME credits.

Additional information and course registration (required) is available at wfc@brooks.af.mil. Registration deadline is August 11, 2004.

Illustration by Dan Harman

ORM IS NOT A "KA-CHING!"

MAJ TOM REMPFER, USAFR
LT COL JUAN GAUD, USAFR
USAFR IMAs to AFMC/ESC/SE

In one of our previous flying squadrons we used to penalize each other jokingly if we said certain objectionable words. When the verbal "foul" occurred we'd say, "Ka-ching!" Eligible words included "Quality" ("Ka-ching!")—a lighthearted reflection on the era where our Air Force took a hack at integrating Total Quality ("Ka-ching!") Management. Today, the concepts of Operational Risk Management (ORM) have been similarly dictated to the entire USAF much like those Quality ("Ka-ching!") days of old. Consequently, we might "Ka-ching" ORM in jest as well, but to do so would make a joke out of common sense, safety and discipline—traits that keep us flying jets and out of trouble.

Believe you me, the last thing a fighter pilot by trade wants to do is teach a base ORM class or two in his spare time, but that's exactly what we've done, and it's caused us to see ORM in a different light. Instead of looking at the mandate as another burden, we keep it simple, and squarely in perspective. We see ORM as merely a tool to help us visualize and encourage common sense. By looking at the evolution of ORM in the civilian and military realm, we see broader applications relevant to our air and space force. This perspective helps us to digest and internalize ORM, versus having it jammed down our throats. The expertise we gained might help you or your crew ("Ka-ching!"), too.

The Evolution of Risk Management:

Our Air Force inherited ORM from the US Army. But just as our "sister" service admits, "The Army has not changed in the past 220-plus years," we realized that we needed to modify the ORM operation slightly to reflect our own distinct USAF corporate culture. First, let's look at the Army's risk management scheme, which has five steps: Step 1—Identify Hazards; Step 2—Assess Hazards; Step 3—Develop control options and make risk decision; Step 4—Implement Controls; and finally, Step 5—Supervise and Evaluate.

The USAF modified our ORM to a six-step construct, consciously adding one more step by splitting the Army's step 3 into the Air Force ORM steps 3 and 4. The Air Force specifically includes subordinate inputs as an integral part of the process in step 3, i.e., to analyze risk control measures. Our step 4 is the risk decision, and a fundamental principle in our USAF ORM program is to ensure that decision is made at the right level. And note that one of the most important aspects of our USAF ORM is that the arrow continues around the circle. This represents the risk management continuum, just as we train, brief, debrief and continuously, applying lessons learned in all aspects of our endeavors.

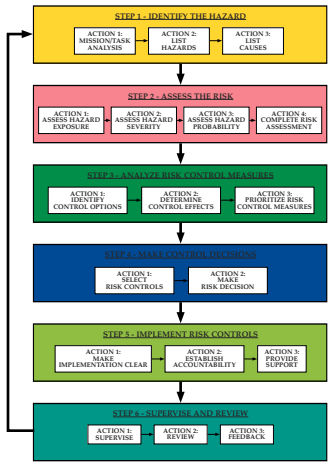
Now, we could go on and on analyzing how historical perspectives are relevant, and how in 1925 Brigadier General William "Billy" Mitchell voiced his belief that the Army Air Service should become an independent arm of the military following the crash of the airship Shenandoah. But we won't. Or we could give credit to Mitchell, the inspirational founder of the USAF, for actually being the first soldier in the Army to use ORM. He took a risk in challenging the Army leadership of the day over the applications of airpower. But none of this rehash, or giving General Mitchell the credit for the first application of ORM, is actually necessary. Suffice it to say that a Presidential Commission adopted the USAF 6-Step version of ORM for the federal executive branch.

And that brings us to USAF ORM. In 2002 Air Force Chief of Staff Gen John P. Jumper issued a memorandum directing the Air Force's senior leaders and commanders to ensure the complete integration of ORM in their areas of responsibility. A DoD Inspector General review called "Eagle Look" had previously critiqued the internalization of USAF risk management as lacking leadership and adequate training. So our senior leaders codified the program in Air Force Policy Directive 90-9. What's important for every aviator and Airman to understand is the top-to-bottom, force-wide empowerment provided by our Chief's directives. He wrote, "ORM provides Airmen at every level with a sound, mission-enabling tool to expand our expeditionary capabilities...the natural way for our people to conduct their professional and personal activities."

Other fundamentals include: accepting no unnecessary risks, accepting risks when benefits outweigh costs, and integrating ORM into operations and planning at all levels. That's the key—every level, every Airman, both in our professional and personal activities. It makes sense, common sense, to use ORM to avoid accidents, engender trust, stay out of trouble and make the right choices. It aptly extrapolates beyond the USAF as well, to our families and to our kids. For those who can relate, or will in the future, we're constantly trying to keep our kids from doing crazy stunts on their skateboards, snowboards and bikes, not to mention soon in their cars. Our kids require ORM!

We're not going to pontificate about the ORM steps, sub-step actions, models, analysis tools or risk control options, or waste your time with the litany of cause-event diagrams. They're all available

in your on-base course, or online through the USAF Safety Center (http://afsafety.af.mil). They provide more guidelines, policy directives, USAF instructions, and multi-service tactics, techniques, and procedures; than you'd ever hope to never have to read. Fortunately, there's a convenient quick reference "pocket guide" online for us pilots.



(Intentionally too small to read!)

Needless to say, the evolution of ORM makes it clear we don't have the corner on risk management in the armed forces or the USAF. Civilian aviation professionals have been honing ORM concepts as well for many years. One familiar civilian flying training program for many military pilots who have pursued FAA ratings is the King Schools. They provide useful hip pocket concepts and rules of thumb for pilots to contemplate.

The Kings drive home the reality that classical risk management by using war stories, wives tales, snappy sayings, trial and error, or the "invincible until proven otherwise" attitude doesn't cut it. They emphasize that aviation's potentially vague and less intuitive risks, such as weather, dictate more formalized thoughts about risk taking. Sometimes, proper risk management goes out the window because you've been successful before, and there are rewards for taking the risks. These propensities for risk taking are exacerbated by our aviator culture that promotes "type A" risk takers, self-confidence, and challenge orientation—all potentially leading to risk tolerance in lieu of forthright risk evaluation.

We've all read about, but of course have never fallen victim to the quirks of excessive risk taking, 'get-home-itis,' or pushing the edge. The Kings remind us that risk management finds us at war with ourselves and our nature. They emphasize that expertise, like our core values, requires us to recognize our inevitable mistakes, and to manage them and call the requisite "Knock It Off." We do this because of our training, prudence, sixth sense, checklist discipline, standards and, yes, ORM. It's another tool for our bag of tricks, and the Kings even offer a couple more we find useful.

They advocate acronyms to aid us in using "CARE" IN THE AIR in order to "PAVE" the way to ensure "I'M SAFE." "CARE" makes sense, and asks consideration of:

Consequences
Alternatives
Reality
External pressures

By "thinking through" the Consequences of your next maneuver, stunt or decision; by looking at Alternatives; by being intellectually honest about the Reality of how things are versus as we planned them to be; and by compartmentalizing and coping with External pressures, we effectively are using an adaptation of ORM. The Kings provide a checklist.

The Kings also remind us that risk factors change in flight with the "PAVE" acronym:

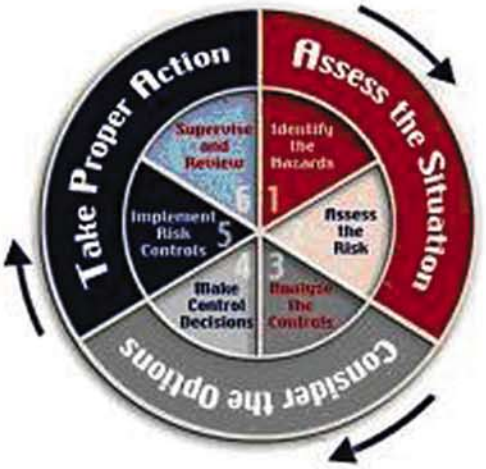
Pilot
Aircraft
enVironment
External Pressures

Obviously, the Pilot must be fit for duty. Makes sense, just like ORM. Our Aircraft must be fit for flight, with properly planned fuel and all mechanical issues resolved. Of course, we then try to calculate, or at least hypothesize, enVironmental risk factors such as the weather, wind, terrain and hours of daylight. And finally, as with the "CARE" acronym, we must ensure that External Pressures don't bite us due to our own goal-oriented behavior which might intensify a conscious or unconscious disregard of insidious risks.

As one more mental crutch, the Kings offer a sub-acronym embedded within "PAVE," specifically for the Pilot. It is "I'M SAFE." As Pilots we must guard against risk due to:

Illness
Medicine
Stress
Alcohol
Food
Emotions

Any of these can render us more fatigued, less patient, less flexible, or less adaptable. Once again, a checklist is provided. And that's all ORM is, too—a set of concepts and tools to keep us on our toes.



Full circle in our analysis of the evolution of ORM, it's also important to note that ORM in the USAF is evolving as well. In order to simplify and internalize the process, ACC introduced a new action-focused ORM methodology called ACT:

Assess the Environment for Risk
Consider Options to Limit Risk
Take Appropriate Action

Further full circle, this evolutionary discussion brings us back to day one at undergraduate pilot training when we learned the three steps we take in an emergency situation:

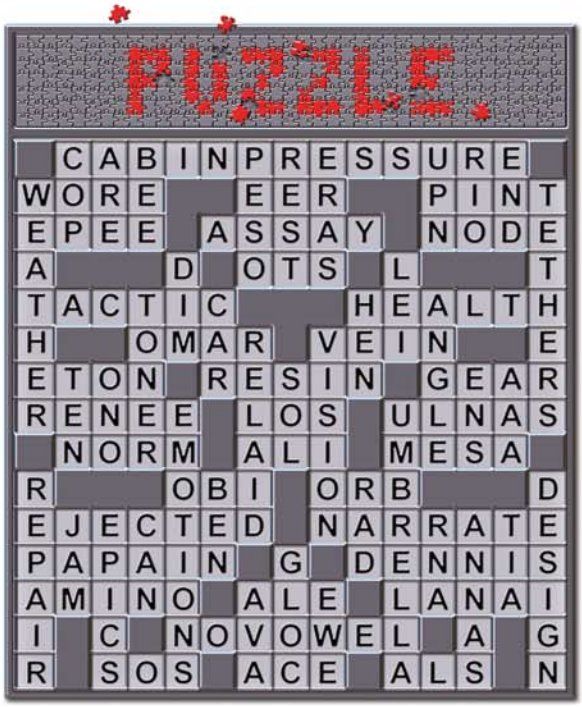
1. Maintain aircraft control
2. Analyze the situation
3. Take the proper action

Bottom line—ORM is nothing new. The "KISS" principle applies. Let's keep it simple and in perspective. ORM or ACT, or whatever you want to call your version of the tools, is simply one of a myriad of means to articulate commonsense thought processes that promote safety. It is no laughing matter, even though we do enjoy teasing the Army!

ORM is our No. 1 job as Airmen and aircrew, as employers or employees, as parents or children. ORM empowers us to make a difference for ourselves, our families, and our future, while encouraging subordinates to do the same.

What we've learned by "thinking through" ORM is that it truly applies to everything, everywhere and everyone. What we've learned by thinking through ORM is that it is not a "Ka-ching!" term. It's the right way to do business all the time, because we want to keep being pilots, parents and professionals.

Solution to puzzle on page 7.



OPS TOPICS

Editor's Note: The following accounts are from actual mishaps. They have been screened to prevent the release of privileged information.

Bombs on target are the desired outcome of almost every mission, whether it is training or combat. Here are a few training sorties where the bombs didn't get to where they were intended. Hopefully, we can learn from the past and ensure we hit what was intended.

Did I Push That Button?

An AT-38 was on a student syllabus-directed conventional surface attack sortie, which was the student's second surface attack sortie. Ground operations, takeoff, departure, range entry and the first 10-degree land pass were normal. Squadron and local directives state to safe the master arm switch prior to turning crosswind. If the turn to crosswind is begun prior to safeing up, the master arm will be safed immediately after rolling out on crosswind. Following the safe escape on the first pass, the student executed a turn to crosswind before safeing the master arm switch, and a single BDU-33 departed the aircraft. The student and the instructor pilot were unaware of the event in flight, and other members of the mishap flight did not see the bomb impact or the smoke charge.

The estimated impact area was approximately two miles northwest of the northern range boundary in a heavily wooded area. After noting a lack of a bomb on the sixth pass of the day and upon film review during post flight, the unintentional release was discovered. How did a bomb come off a perfectly good aircraft when it wasn't supposed to? In this case, a button was pushed when it wasn't supposed to be, and the fact that the master arm switch wasn't in the safe position led to the unintentional weapons release. Luckily for the AF and the crew, it was a practice bomb in a heavily wooded. unpopulated area. Just what could happen in a populated area or on a combat mission? Make sure we follow the procedures established to ensure safe weapons delivery when and where intended.

New Golf Course Hazard

An F-16 pilot flew and debriefed a basic surface attack mission to the local range. The aircraft was configured with four triple ejector racks (TER) with 12 BDU-33s and a centerline tank. The sortie was uneventful except for a no spot on the eleventh delivery attempt. The twelfth bomb released normally. A battle damage check was accomplished on return to base with no discrepancies. During the basic post flight, the weapons crew found the right shoulder position (station 3) of the aircraft's station 4 TER with the forward release hook in the open position, but the impulse cartridge had not fired. To add to the fun, the wing notified the unit during the mission debrief that a single BDU-33 had landed on a golf course about the time they would have been in the area. The BDU-33 had initially impacted out of bounds on hard-packed sand, bounced and came to rest 1536 feet on the number 10 fairway, with minimal damage to the fairway. Luckily, the golfers were several hundred yards away from impact and final position of the BDU-33.

In this case, it wasn't pilot error that caused the inadvertent release, but a mechanical failure. It was determined that during the departure, only 2.2 Gs were used for turn out of traffic, and this is approximately when the BDU-33 departed the aircraft. Analysis of the number three station ejector rack of the mishap TER revealed failure to pass the max load pressure test and failure to pass the low pressure pull check. Teardown of the forward hook assembly of the right station of the mishap TER revealed excessive wear of the housing case where the hook assembly housing pins are installed, as well as

one pin and helical compression spring. The other two stations of the TER passed all tests and did not exhibit excessive wear. The combination of wear on the rack housing and pin, with the short spring, caused the over center locking mechanism to fail at a low load factor and initiate the inadvertent release.

Be aware of when your weapons release, and if you don't get your spot, make sure you follow all the procedures for a possible inadvertent drop. This way we can minimize any damage or react to what may have happened. In addition, make sure your equipment is in top shape. My golf game doesn't need that kind of help.

It's There...It's Not There

Two A-10s took off for a two-ship controlled range sortie, planning to fly high altitude to conduct some in-flight refueling operations, then proceed to deliver some BDU-33s from high altitude dive bomb patterns. On the third weapons delivery pass, one aircraft experienced a hung bomb on pylon 8, TER station 3. The pilot noted the possibility of a hung bomb and continued range operations. On the next pass, the aircraft experienced a multiple release when only one release was commanded. The mishap pilot had expended all BDU-33s by this time, with the exception of the suspected hung bomb, and concluded range operations with three strafe passes. Upon completion of the range work, they rejoined and conducted a bomb check and confirmed that the one aircraft did have a BDU-33 remaining on station 8. In accordance with locally established procedures, the clean aircraft remained in a chase position as the flight returned to base via a flight path that avoided populated areas. As the flight approached within 20 miles of base, the aircraft was vectored for aircraft sequencing. During a turn approximately nine miles north of base, the chase aircraft saw the BDU-33 depart the aircraft and impact in a farmer's field. The flight plotted the location of the impact, relayed the information to the Supervisor of Flying and then executed an uneventful landing.

Maintenance functional tested the aircraft and TERs and no discrepancies were found. All impulse carts were removed from the pylon 8 TER, and it was discovered that all carts had fired but the breech on TER station 3 of the TER experiencing the hung BDU-33. This breech showed a lot of residue remaining in the gun. According to tech data and the munitions depot, the large volume of residue remaining is indicative of a slow burning or damp cart. Per discussion with the munitions depot, it was also discovered that approximately three percent of all cart lots experience some degree of failure.

We load a lot of carts to release a lot of weapons, many of those in combat. Make sure you report what is happening and take the appropriate risk assessment before pressing on with your sortie. You never know when your hung bomb may become un-hung.

The Fog Of Training

An F-16 was on a formal B-course syllabus, four-ship surface attack tactics (SAT) sortie. The element lead (No. 3) was a highly experienced formal training unit instructor pilot (EIP) and the wingman (No. 4) was an inexperienced student pilot (EP). The EIP's aircraft was a block 42, configured with six BDU-33 training bombs. The EP's was also a block 42, configured with six inert BSU-49, 500-pound bombs. Mission planning, flight briefing, ground ops, takeoff, departure and low-level navigation were all normal. The first attack was planned to have the EP release all six BSU-49s from a 10-degree low-angle, high-drag attack on a training target (building) on a simulated airfield. The element deconfliction plan utilized a veer attack for timing deconfliction. The veer attacks were designed for the EP to arc 3.5 NM south and east of the target and subsequently check in for the attack three seconds after EIP's bomb impact.

The flight checked in with range control prior to entering the scheduled tactics range. Range control cleared the flight onto the range and advised the flight of a ground party at observation point Foxtrot (OP Foxtrot) four NM east of the planned target. Prior to the attack, EP confirmed high system accuracy at the initial point. EP initially flew inside the planned 3.5 NM arc and checked away from the target to correct back to the arc. EP over-corrected to a 4.4 NM arc southeast of the target. The EIP executed a level delivery, dropping two BDU-33s IAW the briefed plan. Upon weapon impact, EIP made the radio transmission "...four, hit my smoke." EP responded to EIP's radio call by initiating a left turn toward the target area while visually searching for the smoke from weapon impact. Simultaneously, the ground party at OP Foxtrot fired a "Smokey Sam" simulated surface-to-air missile. EP scanned for smoke in the direction of the target area and the first smoke he acquired was that from the Smokey Sam at OP Foxtrot. EP fixated on the smoke, failed to cross-check computed weapon steering and visually dropped six BSU-49s on OP Foxtrot. Weapons impact was approximately 200 feet from ground personnel. Neither pilot was aware that the EP's ordnance was dropped on the manned site at OP Foxtrot. The element returned uneventfully to base and a range incident report was filed by the ground party at OP Foxtrot.

It is very easy to get fixated on the wrong target, and luckily for us, this was a training exercise and no one was hurt. There have been several incidents in the War on Terror where we did get the wrong target, just like this student. No matter the mission, make sure the target you choose and the target you are assigned are the same thing.

Maintenance Matters

Editor's Note: The following accounts are from actual mishaps. They have been screened to prevent the release of privileged information.

More damage due to violation of tech data and bad choices by maintainers. We need to stop being our own worst enemy.

Forgot To Remove The Pieces

The F-117 preflight was normal until the pilot arrived. The F-117 uses a canopy sill guard to prevent any damage while entering or exiting the aircraft, and there is a T.O. step to "remove canopy sill guard." The pilot accomplished all preflight items without incident until time to lower the canopy. The pilot attempted to lower the canopy, but it stopped just short of closing. The pilot raised and lowered the canopy a second time with the same result, but this time became stuck. As maintenance tried to figure out what was going on, they realized the left canopy sill guard was still in place. The sill guard was now wedged in between the canopy and canopy rail. The pilot shut down both engines and maintenance tried to open the canopy through normal procedures, but was unable to unstick the canopy. Aircraft recovery specialists were called to the scene and they "removed" the canopy from the aircraft.

Here was a case of a routine launch and the mission was cancelled. Think of the extra maintenance of removing and reinstalling the canopy to get the pilot out. There were a lot of opportunities in the safety chain to prevent this incident. Why didn't the crew chiefs ensure the canopy sill was removed as per the T.O.? Why didn't the pilot see that it hadn't been done? I have never been a proponent of operations telling maintenance what to do, but they should never find something maintenance should have done. However, they are our back-up to help us prevent mishaps. Let's make sure we follow the T.O. and ensure we make the mission instead of stopping it!

Stand Rail Versus Bomb Door

A weapons crew headed to one of their B-1Bs that was in no-flight status for a 180-day pylon launcher missile simulator (PLMS) operational check. The aircraft was configured with external electrical power and cooling air, no hydraulic power, and a B-4 maintenance stand positioned for access to the applicable weapons bay. The forward weapons bay (FWB) and aft weapons bays (AWB) doors were closed and the intermediate weapons bay (IWB) doors were open. After completing the PLMS check in the IWB, the load crew began preparation to move to the AWB. The aircraft's auxiliary power units were used to provide hydraulic power for opening the AWB doors and closing the IWB doors. The IWB safing handles were positioned for door movement, and the command to close the IWB doors was given. Unfortunately, the crew forgot one step. The IWB doors closed, crushing the safety rail of the B-4 stand. Each IWB door was damaged in identical locations. The doors were immediately reopened, the mishap reported, and the aircraft impounded.

Another aircraft that had to stay in no-flight status for "extra" repair work. Now, when in a maintainer's training is the topic of clearing all moving parts prior to moving them discussed? If my old mind is correct, I think it was in the very beginning and discussed every other time I was trained on a task involving moving flight controls or aircraft components. Not to mention the T.O. requires you to ensure the doors are clear prior to moving them. Another preventable mishap if the crew had followed tech data. Was it inattention to detail or just plain forgetfulness? You tell me.

What Does That Red Light Mean?

Some contract maintenance professionals were performing some routine maintenance on a C-21's landing gear brake hoses. On the C-21, it's necessary to lower the inboard main gear doors to access the brake hoses. Additionally, there exists a specific approved Learjet procedure that details how to lower the gear doors. Rather than using this procedure, the maintenance team elected to lower the gear doors using a locally-derived technique. The aircraft was jacked as required and placed in an air-mode condition, and the inboard gear doors were lowered by placing the cockpit landing gear control handle to the up (retract) position and intermittently toggling the auxiliary hydraulic switch to the on position. As the doors reached their desired maintenance positions, the landing gear handle was placed back to the down (extend) position. The cockpit gear indicating system displayed a down and locked landing gear condition (three green lights and two red lights for the main gear doors). The repair was then completed with no problems.

The aircraft jacking checklist states that prior to lowering, the landing gear should be down and checked for three green lights and no red lights. The aircraft was lowered to a ground mode position with the inboard landing gear doors in the open positions (two red lights on in the cockpit). Upon reaching the ground, the three jacks were removed. In order to raise the inboard gear doors, the cockpit auxiliary hydraulic switch was activated. Upon switch activation, the inboard gear doors closed. Simultaneously, the nose actuator unlocked and the nose strut retracted. The aircraft nose then settled to the ground as the nose gear retracted. The aircraft had damage to the nose and nose gear door assemblies.

Qualified maintenance professionals caused damage when they developed their own workaround to established company procedures. I know; "the people who write the tech orders don't know how the aircraft works or the most effective way to do the job. They try to make it difficult, and all that safety stuff like cautions and warnings are just extra ink on the paper." *Wrong!* Follow the book, don't take shortcuts and we won't damage aircraft and create extra work for ourselves. Be the professionals that leadership relies on.

F-16 Versus Hangar

A tow crew was set up to tow an F-16 from the aircraft parking spot into the wash rack. In this case, the parking spot was right next door to the wash rack, so the tow would be short. When they arrived at the aircraft they observed another F-16 was still in the wash rack. In order to get their aircraft into the wash rack, the other one had to be removed. They called the responsible squadron to get the second F-16 removed, but were informed that the responsible squadron didn't have personnel available to move the aircraft right then. Being the team players that they are, they decided to tow the aircraft out of the hangar for them, and were granted permission for the tows.

All the tow team members were fully trained on towing aircraft. When the tow team arrived at the wash rack, the exterior roll-up door was raised to within 10 feet of the fully raised position. The tow supervisor enlisted the help of a passing maintenance expediter to act as the right side wing walker. A pre-tow briefing was conducted IAW the checklist. However, neither the tow supervisor nor any of the other members of the tow team thought to raise the roll-up door to the fully raised position prior to commencing the tow out of the hangar. The standing operating procedure (not in writing) on the flightline is that only members assigned to the wash rack can operate these roll-up doors. Also, there are no signs posted at or near the controls for this door to warn unauthorized users. Additionally, the flightline maintainers towing aircraft into the wash rack and the owning operators operating these roll-up doors had not been trained and identified IAW AFOSH STD 91-100, 7.2.3.4 and 7.2.3.5. AFOSH 91-100 states that, "Only qualified personnel approved by the squadron commander or designated representative will be authorized to operate the hangar doors."

AFOSH 91-100 also states: "Overhead doors will be opened before aircraft are moved through the door entrance."

There is a very slight decline, designed to facilitate drainage, to the ramp as you exit the wash rack. The tow crew took their positions and the tow commenced. As the aircraft departed the wash rack, the nose of the aircraft dipped with the declining grade, causing the vertical stabilizer to raise a couple of inches. This rise in the rear of the aircraft caused the leading edge of the vertical stabilizer to strike the bottom edge of the wash rack roll-up door. The tow supervisor immediately halted the towing operation and the aircraft stopped just outside of the wash rack threshold. The tow team conducted a visual assessment for damages.

Here we have a qualified tow crew that was not qualified to operate the hangar doors, and the unwritten policy that only wash rack people can operate the doors prevented them from knowing the safety requirements. Where was supervision in this incident? There were some systemic problems that led to the aircraft damage, such as hangar door rules and qualifications. Plus, the tow crew did not ensure the tow path was clear of obstructions as required by T.O. Once again a chain of events that led to extra work for maintenance and reduced mission capability. What is your hangar door policy, and are your people qualified to operate them?

FY04 Flight Mishaps
(Oct 03-Jun 04)

17 Class A Mishaps
8 Fatalities
9 Aircraft Destroyed

FY03 Flight Mishaps
(Oct 02-Jun 03)

22 Class A Mishaps
10 Fatalities
15 Aircraft Destroyed

05 Oct		A C-17 had an engine failure (upgraded to Class A).
09 Oct		A KC-135E experienced a number 3 engine fire.
14 Oct	✈	A T-38 crashed during takeoff.
20 Oct	✶	An F-22 engine suffered FOD damage during a test cell run.
17 Nov		A KC-10 experienced a destroyed engine.
18 Nov	✈	An A-10 crashed during a training mission.
23 Nov	✈	An MH-53 crashed during a mission. Four AF crewmembers were killed.
11 Dec	✶	A C-5 engine had damage from a compressor stall during a test cell run.
30 Dec	✶	An RQ-1 crashed after experienced a software anomaly.
31 Jan		A KC-10 experienced an engine failure.
03 Feb		An E-4B had an engine failure in flight.
04 Feb		A C-5B had a right main landing gear failure.
25 Feb	✈	An A-10 crashed after takeoff. The pilot did not survive.
27 Feb		A B-1B departed the runway during landing .
02 Mar	✶	An F-15 engine was damaged by FOD during a maintenance run.
03 Apr	✈	A T-6 crashed on takeoff. Both pilots were killed.
29 Apr		A C-130 landing gear collapsed during landing.
06 May	✈	An F-15 was destroyed after it suffered a birdstrike.
08 May		A C-5B had an engine failure inflight.
17 May	✈✈	Two F-16s had a mid-air collision, one pilot was killed.
21 May	✈	An F-15 crashed during a training sortie.

- A Class A mishap is defined as one where there is loss of life, injury resulting in permanent total disability, destruction of an AF aircraft, and/or property damage/loss exceeding $1 million.
- These Class A mishap descriptions have been sanitized to protect privilege.
- Unless otherwise stated, all crewmembers successfully ejected/egressed from their aircraft.
- Reflects only USAF military fatalities.
- "✈" Denotes a destroyed aircraft.
- "✶" Denotes a Class A mishap that is of the "non-rate producer" variety. Per AFI 91-204 criteria, only those mishaps categorized as "Flight Mishaps" are used in determining overall Flight Mishap Rates. Non-rate producers include the Class A "Flight-Related," "Flight-Unmanned Vehicle," and "Ground" mishaps that are shown here for information purposes.
- Flight and ground safety statistics are updated frequently and may be viewed at the following web address: http://afsafety.kirtland.af.mil/AFSC/RDBMS/Flight/stats/statspage.html.
- **Current as of 02 Jun 04**.

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AVIATION

The Aviation Well Done Award is presented for outstanding airmanship and professional performance during a hazardous situation and for a significant contribution to the United States Air Force Mishap Prevention Program.

LT COL KEVIN COLEMAN
339 FLTS/DO
Robins AFB GA

On 10 June 2003, Lt Col Kevin C. Coleman departed on an initial Functional Check Flight (FCF) in an F-15B that had just completed its Programmed Depot Maintenance (PDM) cycle. The situation Lt Col Coleman faced on this particular mission placed an extraordinary demand on his airmanship skills, judgment and systems knowledge.

During the maximum performance takeoff, the Pitch Roll Channel Assembly (PRCA) failed, resulting in a 60 percent reduction in stabilator authority. Simultaneously, the left engine afterburner failed. Lt Col Coleman continued the departure to get to a safe altitude while assessing his situation and prepared for the engine failure checklist and a return to base.

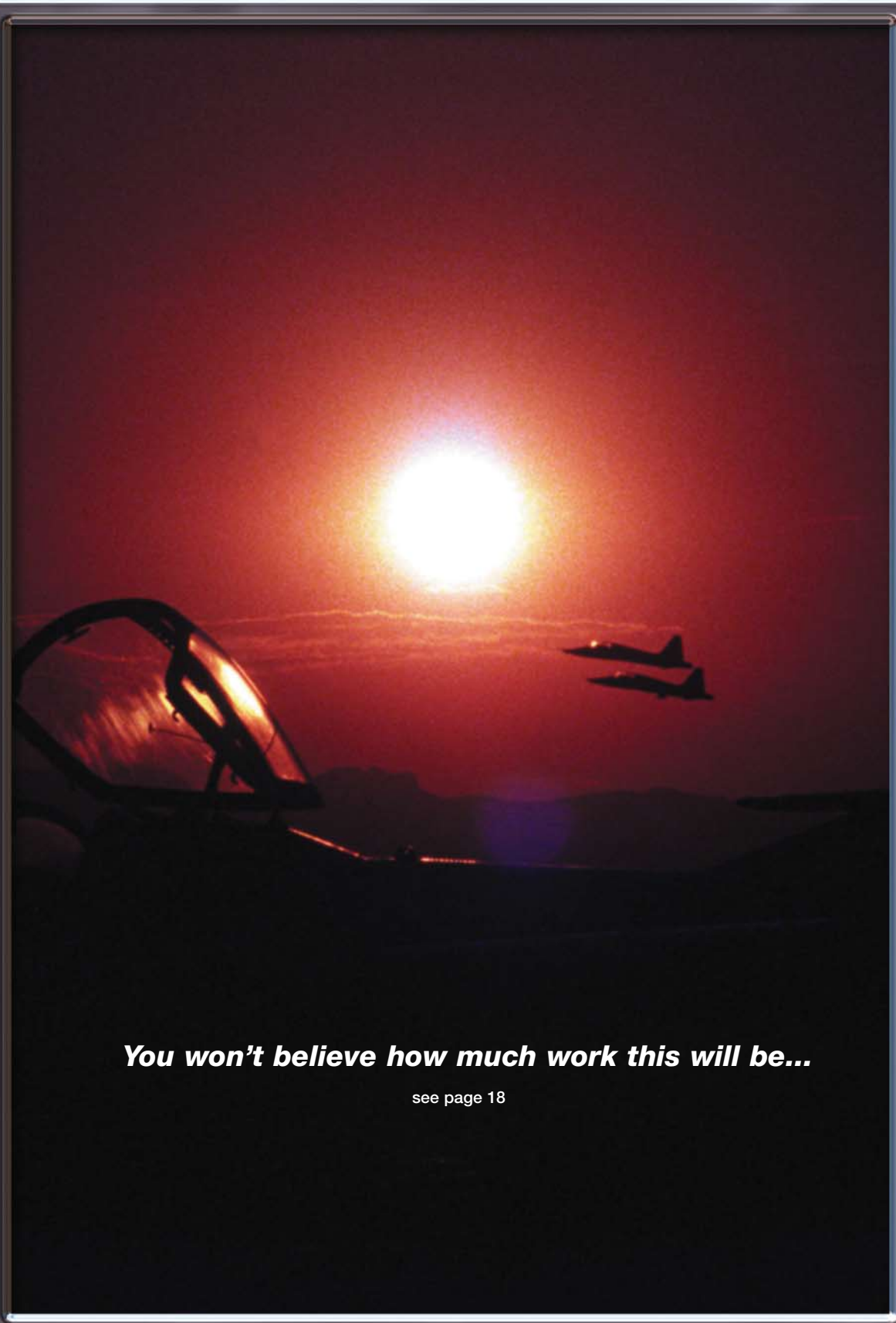
During the departure, and while already handling two malfunctions, Lt Col Coleman noticed his control stick becoming progressively looser. The control stick eventually became disconnected from the aircraft. This placed Lt Col Coleman in a situation never encountered before. At this point, an ejection would have been easily justified. Instead, concerned about the city of Macon, GA directly below him and in complete disregard for himself, he masterfully regained control of the aircraft using only the Control Augmentation and Stability (CAS) system.

Lt Col Coleman shut down the failed left engine in accordance with flight publications procedures and checklists and started guiding the aircraft toward an established bailout area. Continuing to assess the situation while he flew the crippled aircraft toward the bailout area using only the CAS (something that has never been done before), he determined that he had a very limited amount of aircraft control. He determined he could safely recover the aircraft to base using the CAS and his known limited control capability, a much better option than the once-impending bailout alternative.

Using only the CAS portion of the flight control system with a disconnected control stick and the numerous other compound emergencies (another flight control problem and being heavy weight and single-engine on a hot summer day), Lt Col Coleman successfully recovered his disabled aircraft to a successful landing.

Post flight investigation found the control stick was not properly torqued, as the stick attack bolt was left finger-tight. This area is not normally a part of the PDM work package. The failure of the PRCA is rare but seems to become a problem when substantial time elapses between the PDM checks and the FCF. The left engine failure is a common -100 engine failure.

Thanks to his expert piloting skills, courage and outstanding use of limited resources during a unique emergency situation, Lt Col Coleman was able to safely recover the F-15 Eagle and save a valuable Air Force asset.



You won't believe how much work this will be...

see page 18