THE COMBAT EDGE

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THE COMBAT EDGE

Air Combat Command
Safety Magazine

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ABOUT THE COVER

Down on the deck, under the cloud and in visibility that would ground its contemporaries, it can hide from missile and AA radars for all but the few seconds needed for a devastating gun or Maverick attack. In its demanding role of visual-range tank-busting, the A-10 Thunderbolt II -'Warthog'- is uniquely well-suited.

ACCent on Safety

A year ago this month we welcomed everyone to Air Combat Command. In the time since the stand up of ACC, we have undergone a profound transformation. The change attendant in building a new command and infusing it with the culture of quality that creates a leadership style and working climate that inspires trust, teamwork and continuous improvement provided each of us with new realities, new challenges, and new opportunities. Everyone is to be commended for the exemplary manner in which they met the challenges and took advantage of the opportunities. However, fast paced change continues to be the order of our business. In the past year we've added new missions and organizations (Air Rescue Service) and are in the process of transferring others (ICBM units). With so much change still taking place, the potential to focus our attentions away from our day-to-day operational business remains high. It would be easy for us to become distracted and lose sight of our goal of safe, effective operations. Good communication is the key to preventing the distraction and loss of direction that sometimes accompanies changes. Commanders, supervisors, and workers must all talk to one another to ensure everyone remains focused on the tasks at hand. Good, clean, open lines of communication, both up and down the chain of command, are the key.

The 101 Critical Days program started with the Memorial Day weekend and will continue through Labor Day. Historically we know that most deaths during the 101 Critical Days will occur in traffic-related mishaps and will involve a lack of judgement and self-discipline as causal factors. We must stop this tragic waste, but we can't do it alone. Our success is dependent on everyone, safety professionals, commanders, supervisors, and workers to combat distraction, stress, and poor judgement so that all of our people are protected, both on and off duty.

Our ACC safety conference will be 22-24 Jun 93 at Langley AFB VA. This year we are conducting a combined conference with "Quality" as the overall theme. We're hoping to capitalize on the synergistic effect of having all three disciplines (Flight, Weapons, and Ground) together at the conference. I'm looking forward to seeing all of our safety folks at the conference.

In the meantime, let me reemphasize -- this is your magazine! It will only be as good as you make it through your articles, inputs, and feedback. We are committed to giving you the best quality product possible, but we need you and your ideas!

Colonel Bodie R. Bodenheim
Chief of Safety

Are you a cause? or do you have causal tendencies?

Are You A Cause?

or do you have causal tendencies?

Lt Col Armando V. Villagran
8 AF/SED
Barksdale AFB LA

The Air Force Safety Agency (AFSA) at Norton AFB took a new approach a couple of years ago in writing mishap causes. Actually, it was the guidance they provided to the field, i.e., those of us who write findings and causes. The CATEGORY-AGENT-REASON (CAR taxonomy) method of writing mishap causes was born. It is basically an analysis of the cause(s) behind a mishap. Many of you have probably already seen this in safety reports. Normally, the analysis wording is listed in parentheses after a "causal" finding. This cause analysis looks closely at the mishap factors associated with a mishap attempting to identify who is accountable, who or what is responsible and at what level/area, and what is the underlying reason for the event. There are several accountable areas e.g., maintenance, logistics, natural phenomena, etc., and reasons that can be listed. I'd like to address those over which we have some control, namely the OPERATIONS area and more importantly, the "human factors" type reasons. These are the type from which we tend to shy away because we either don't understand them or they're something we can't put our hands on. They're not the simple (but costly) "hardware-type" fixes or "tech order" fixes. These are the "human" error type of reasons. If you look at the definitions which AFSA has provided, you may find some that at one time or another, have described you or one of your fellow aviators. It'll give you a little information on the human side of the man-machine equation.

Complacency: *An inappropriate state of well being, overconfidence, or undermotivation that resulted in a diminished level of vigilance.*

A lot of us have been here and are lucky enough to still be alive. This one is a killer if you don't stay on top of things or if you let yourself get too comfortable in your job. Experience tends to nurture this little beast. Watch the other guy as well. You're sitting there as lead, fat, dumb and happy, knowing good and well that your wingman is where he's supposed to be. Or is he? Missed or incomplete briefings, checklist items; these are all tell-tale signs. If you're just sitting there enjoying the ride, you might have just missed something that could kill you.

Drugs/medicine: *Any substance or chemical compound that adversely affected perception, balance, judgement, thinking ability or coordination.*

"What's a little sniffle? Besides, it'll clear up once I take a few of these tablets the flight doc gave me about a year ago." Let the flight docs earn their pay the easy way -- at sick call; not at a remote mishap site trying to piece you back together! A commander is much more forgiving if you cancel a

sortie because you went DNIF, than if you bang up one of his airplanes, or fail to bring it back because you "self-medicated."

Accepted Risk: *Decision is made to perform the mission/task after being aware of the potential for mishap.*

This reason is one normally attributed to those with supervisory responsibility of an operation. Actually, some missions are conducted under an "accepted risk" condition. On a lower level, let's say it's Friday afternoon, you're on your way home, anxious to get to the bar to do a little air-to-air hand-flying combat; but you've got some weather ahead. If you go around it, all the eats will be gone by the time you get to the bar. So you press, hoping the storm effects don't do you in. In this case, you're accepting the risk that you could get clobbered, but do it anyway. (Actually, this sounds more like poor judgement!) What's the cure? Well, just as the definition states, "being aware of the potential" should tell you that you'd better be on your toes. If you're a supervisor, look out, this is one you really need to be aware of.

Anthropometry: *Any human physical dimension (e.g. height, weight, and build of individual).*

This is one over which many of us have no control, but of which you need to be aware in case you're one of those gorilla or Tom Thumb sized crewmembers which aircraft cockpit designers don't consider. You're strapped in nice and cozy in your ejection seat, but you can't reach that certain switch on the panel in front of you...unless you lean way, way forward. Nice technique, but it may not work under acceleration forces or when the ol' pucker factor has you doing something else. If you're one of those non-standard type pilots, make sure you can reach everything you need to reach while you're still sitting on the ground. Don't wait until Murphy decides to come along to find out you can't reach a switch or read a certain instrument.

Background: *An identified fact or circumstance directly related to the past experience of an individual. Includes morality, character, independence, responsibility, dependability, stereotype, etc.*

You are one of those independent types who prefers to do things on his own; a loner. You don't like to be a team player. The Tom Cruise/"Maverick" type. Your parents didn't like you. Whatever! This is one in which your personality really affects the way other flyers see you. "Do I really want this guy as my lead?" "Do I want this guy covering my six?"

Discipline: *Willful noncompliance with known and understood directives. Includes horseplay.*

Horseplay you say? Not me! But what about that little fly-by at Hometown, USA, to impress dear ol' mom and dad? Or what about that little aileron roll on departure leg away from home station? No one will notice, much less care! This one has ruined many a pilot's career. The key to avoid this one is to fly by the rules that you learned to fly by -- even when no one is watching. Impress the folks back home with a long, distinguished flying career; not by being grounded.

Judgement: *Inappropriate assessment of information vital to decision making, prioritization, or task management.*

Inexperienced pilots suffer through this phase in their flying careers to a certain degree. But then you also have the "old head" who should have known better, but disregarded everything that allowed him to become an "old head," and decides to try something new, something out of the ordinary, a short cut, whatever, to get the job done...only to fall short. These are the mistakes everyone labels as "stupid mistakes" when actually, the guy just wasn't using his aviator sense. If it doesn't sound right, question it. Don't become an accomplice to a "stupid mistake!"

Pathological: *Pre-existing physical, mental, or emotional deficiency or illness that affected performance.*

Not being a flight doc, I won't dwell on this one too much, except to say that it sounds like the "body" or "mind" is not ready to fly, but they can't convince the "will" to stay on the ground.

Perceptions: *Misinterpretation of height, distance, closure, time, speed, disorienting stimuli, confusing stimuli.*

This one rears its ugly head often. Your instruments are there for a purpose, not just to take up space. When your eyeballs see something, but your body feels something else, it's time to trust your instruments. When your wingman/cellmate is doing something that doesn't look right, say something -- even if it means breaking EMCON! Don't assume he knows what he's doing! And above all, don't let a MAYDAY call be the reason to break EMCON!

Physiological: *Adverse conditions or reactions that disrupted normal human biological functions or processes. Examples include GLOC/GLC, hypoxia, hyperventilation, decompression sickness, evolved/trapped gas, fatigue.*

When was your last physiological training? Do you still remember all your symptoms? Are we still drinking that last minute carbonated drink just before we step to the jet? An awareness of this monster and how to combat it can keep you out of trouble should Murphy decide to come along for a ride. Remember, a P.R.I.C.E. check is something you do with your oxygen system, not something you do at the BX!

Preparation: *Inadequate accomplishment of planning, briefing, flight clearance, preflight.*

This one is a no-brainer. Ever hear, "This one's a canned mission, so why check the coordinates?" Or, "We've done it a lot of times, so why brief it again?" Or, "All procedures will be normal, so let's go!" There's no excuse for this. If you don't have the time to completely plan your flight, to brief the entire flight, or conduct a complete preflight, then maybe you should consider flying some other day when you can. Don't make this your last flight!

Proficiency: *Not able to perform assigned task at acceptable level due to lack of technical skill. Individual had been trained and met minimum acceptable standards.*

Again, for those of us new to the system, experienced or inexperienced in the system, or who have been away from the system, this is one we should personally monitor. **Don't try something you're not ready for.** It's much better to take that low vis approach around, to fly at a little higher altitude, or use a little less bank, than to have mother earth tell you that you weren't ready.

Psychological: *Attention anomalies including distraction, channelized attention, habit pattern interference, or task saturation; poor habits; insufficient aptitude or cognitive abilities; overmotivation; psychomotor coordination; personality; emotions, moods, behavior; fatigue (mental/emotional exhaustion); stress; anxiety; suffering; worry derived from task, environment, or personal situation.*

Not paying attention to the right thing(s) during a critical phase of flight has killed many an aviator. Staying focused on the task at hand, staying ahead of the aircraft, and being mentally prepared will ensure this beast doesn't do us in. You just can't emphasize this enough! Keeping your personal problems on the ground will help ensure that you stay in the air.

There you have it. The reasons and their definitions that someone may assign to a cause for something that you or someone else did that resulted in a mishap. Many of them have warning signs, or tell-tale signs that should warn either yourself or someone else that maybe something needs to be done, that something needs to be said. It's like drinking and driving; combine any of the reasons above with flying, and throw in a little distractor like an aircraft malfunction, and you're asking for trouble. As demanding as flying is, we don't need to compound our problems by not being physically, mentally and emotionally ready to fly. The discussion above was meant to give you a little insight into what some of our past human factor type mishaps have been. It's better that we know about the reasons now, so we can do something about them, than have to let an investigation board determine why later! FLY SAFE! ■

Capt Robert D. Gibson
3901 MES/DOV
Vandenberg AFB CA

THE BIG THREE

Sometimes it seems like only yesterday -- my first alert. Driving out to P01, it felt like it took forever to go 30 miles. And to think this was one of the closer sites. I remember wondering about the crews heading out to H01 that was almost 150 miles away! I was really apprehensive; there were so many questions going through my mind. Did CCTS training really prepare me? How busy would it be? Would my commander explain things to me when needed? All these questions, and more, would soon be answered.

Yes, as far as technical competence goes, the "school house" had prepared me very well, although it was obvious that field experience went a long way. And as far as the alert being busy, it wasn't all that bad except for the security situation 1A and having to go process Inhibit Anti-Jam and EPAP -- and I thought that kind of status happened only during trainer rides. And certainly my commander was more than accommodating in answering any questions I had.

I'll never forget closing the blast door after the off-going crew departed and realizing I was now truly on my first alert -- trusted by the Command, relied on by my commander and responsible for a multi-million dollar weapon system. It was a little awe inspiring, and at the same time a bit overwhelming.

After ordering lunch and doing the LCC inspections, I was in for a real surprise. My commander said he was going to hit the rack and get some sleep! "Oh, and by the way" he said, "Don't hesitate to wake me if you need any help." "Wait a minute" I thought to myself, "aren't you supposed to stay awake for my first few alerts? Just to be sure you trust me?" As though he was reading my mind, just before he

pulled the bed curtain tight he said, "Remember the Big Three." "The Big Three" I thought with a puzzled look on my face. "Sure, the Big Three. Status monitoring, checklist discipline and crew coordination, the basic survival skills of any crew member." "Funny," I mumbled. "I thought I'd heard all the cliches, acronyms, and 'missileese' I would ever need in the CCTS. But I never heard that one." With a knowledgeable smile he continued, "Solid status monitoring and sound checklist discipline will get you through almost any scenario. And if they don't, there's always crew coordination. And to satisfy that, wake me up!"

I remembered those final words as the FSC called from topside and relayed information to me about the CAT I team passing through the flight area en route to P10. "Fine," I replied, "keep me informed." Not 10 minutes later he called back saying the team chief of the CAT I convoy had arrived at LF 10 but had forgotten to pick up his MECS authenticators at KCCC before he left the support base. In other words, he couldn't authenticate to get on site.

I quickly looked at the bed curtain and noticed it hadn't moved during the last hour. My commander was still fast asleep. How could anyone sleep that well at 1:00 in the afternoon? "Should I wake him?" I thought. Let's see, the Big Three: 1. Status Monitoring. I was well aware of the status -- boy was I aware of the status! There was a convoy of 6 ground vehicles and a helicopter with a total of about 30 people waiting for my decision. 2. Checklist Discipline. SACR 207-16 was directing me to call a security situation 1A! That seemed simple enough. 3. Crew Coordination. I think I better use it, but there wasn't even a ruffle of that curtain. I wonder if he'll mind me waking him? Nah, I think this is pretty serious. Heck, I only saw 1 or 2 Sit Ones at Vandenberg during trainer rides. I guess all those MPT sessions really did make a difference!

Mumbling something about new deputies was all I heard after I called him. After pulling the curtain aside and rubbing his eyes, my commander asked what was wrong. I quickly filled him in on the situation -- not to mention reminding him about the Big Three! Yes, the Team Chief really did forget his MECS, and yes we really had to declare a Sit 1A, and by all means was I glad he had told me about the Big Three. To this day I have never forgotten them.

The rest of the alert seemed fairly uneventful, although I did remind my commander about Number Three of the Big Three a few more times after having to wake him for the Status Out scenario followed by Anti-Jam. And the power fluxes caused by the thunderstorms woke him a few more times until he finally relinquished the rack to me early in the evening.

As I pulled the bed curtain tight behind me, I reminded him not to hesitate to wake me if he needed help with the Big Three; after all, I felt like a seasoned pro after just a few hours on alert.

Alert today isn't that much different than it was a few years ago. Although the weapon systems have been modified, the same basic skills helpful to crew members back then are still useful today. The Big Three: Status Monitoring, Checklist Discipline, and Crew Coordination go a long way with a little bit of sound weapon system and EWO knowledge. They are paramount for successfully completing an alert or a trainer ride.

So if you're on your first alert or your 100th, calling a 1A or a 6D, always keep in mind the Big Three. They'll make life easier for you as they did for me not so long ago. ■

LCDR Mike Cross
VFA-22
FPO AP 96601

HABIT PATTERNS

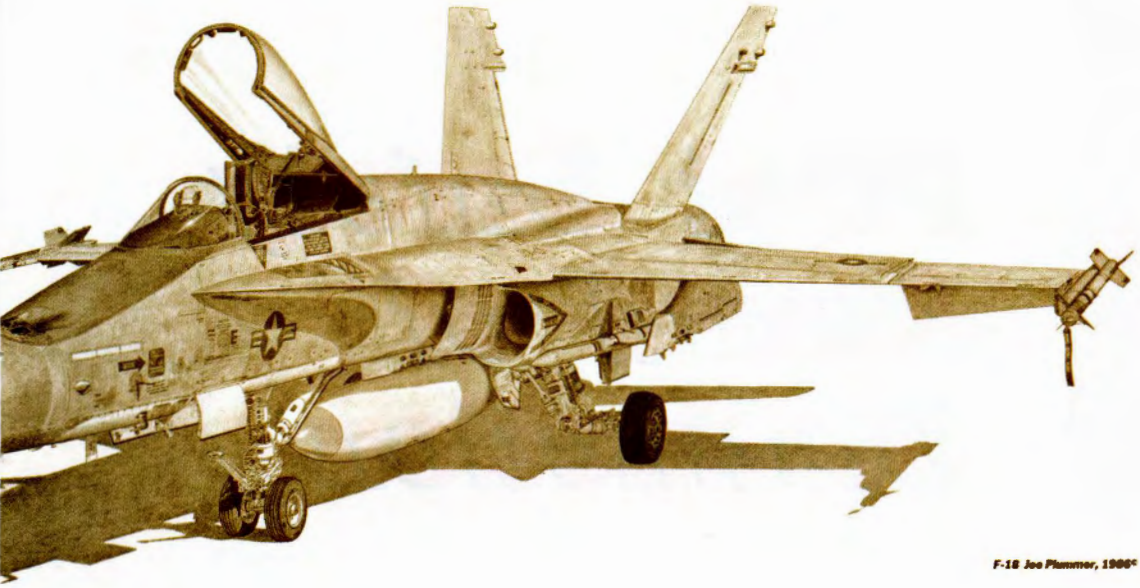
It was one of those days when all was right with the world. I was the new Carrier Air Group Landing Signals Officer (CAG LSO) on the Navy's newest ship, flying the newest airplanes in the inventory. After my tour in the Replacement Air Group (RAG), I was excited to be back in the fleet and doing some "real tactical flying." The day prior the operations officer had asked me if I would like to lead a small mini-strike consisting of 2 Tomcats, 2 Intruders and 4 Hornets. I jumped at the chance and was full of anticipation for a great hop since the day began as one of those days in southern California when you could see forever.

At this point I'll digress a little. As I mentioned, I had just come from a tour in the RAG where I was fortunate to have been an instructor in the air-to-air phase. As in all phases of training, we stressed habit patterns very heavily. In fact, one factor I personally think makes a good aviator is solid habit patterns. He does the same thing at the same time on every hop; and if something arises to interrupt his habit pattern, he becomes acutely aware of the potential to forget something since his habit pattern has been changed.

One of the particular areas we stressed during the air-to-air phase was trigger squeezes. The Hornet video recording system allows the review of HUD tapes, and a cue is indicated when the trigger is squeezed. It does no good to arrive at a valid weapons envelope and not get a missile off because you are not in the habit of squeezing the trigger, so we reviewed these HUD tapes after every mission to ensure the trigger was actually squeezed as shots were called. After all, "you fight like you train."

Now, back to that beautiful day in Southern California. My wingman and I came up with a solid plan. We would be opposed by some "bad guys" from a nearby Naval Air Station. As our brief time approached, however, things began to change. Strike ops called and reduced our package to just 2 Tomcats and 2 Hornets. Not a big deal since we still had plenty of firepower. Then just as we started our brief, the Duty Officer informed us that we would each be carrying a live AIM-9 missile in addition to our practice "blue death." I quickly checked to make sure we could go configured like that, and after receiving approval proceeded with the brief.

The brief, man-up and launch all went smoothly and we were soon on our way. As we approached the start of our tactical route, we attempted to check in with the bandits but couldn't seem to reach them. I assumed they must have had some aircraft delays and decided to press on. At the appointed time our Tomcats pressed out in front of us and swept through the



F-18 Joe Plummer, 1986

target area to clear out any bandits. My wingman and I arrived unopposed, completed our tactical deliveries and then climbed up to do some administrative runs and weapons system grooming. As I came off target from my second run, I reached up to turn the Master Arm off and call "off target." At that instant I looked across the circle at my wingman to find an F-16 rolling in on him. I called for my wingman to break and my fangs came out as I put the airplane in the air-to-air mode and lit out after the offending bandit. I called several quick shots against the bandit who didn't see me until it was too late. After seeing me, he did an aileron roll and left. I turned back toward the target and found myself in perfect position to roll in again. "Gee, just like the commercial" I thought as I called in and reached up to turn the Master Arm back on. My heart stopped as I stared in horror at the switch already in the **ON** position! "You idiot, you have live missiles!!" I screamed to myself. I was almost afraid to look out and see if I still had my missile on the airplane. To my great relief it was still out there. I managed to stop shaking enough to get us back to the ship and land.

In our debrief, I told my wingman what had happened and he was as shocked as I had been. To this day I am not sure exactly why I did not squeeze the trigger. After all, my ingrained habit pattern was to squeeze the trigger at shot simulations. I can honestly say I didn't remind myself about that live missile as I engaged the bandit. As I calmed down and thought more about this event, I realized that I had done a couple of things right and a few things wrong. First and foremost, we had briefed the live missiles in detail, going over the squadron SOP closely as to when the trigger could and could not be squeezed. Second, we had reviewed a mishap a few days prior where a missile had been unintentionally fired from a Hornet and we talked extensively about carrying live missiles on training flights.

The things I had done wrong were nearly fatal for that F-16 driver. First, I should not have engaged him in the target area. As per our brief, I should have told my wingman to rock his wings to acknowledge the bandit's presence and continue our bombing. Second, I had allowed my aggression to interrupt my habit pattern of safeing up off target. The only thing that I can think of that kept me from executing my normal habit and actually squeezing the trigger was the attention we had paid to carrying live missiles previously.

I am still convinced that strong habit patterns are essential in a solid aviator, but luckily for that F-16 driver I broke my habit pattern on that day when all almost went wrong with the world!

■

Pilot Safety Award of Distinction

Capt Schneider, an instructor pilot at Beale AFB, was ferrying a U-2R to a deployment base. Weather in the area consisted of a solid cloud deck from 15,000' upward. Shortly after leveling the aircraft at FL450, while still in a cirrus deck with no discernible horizon, the engine compressor stalled several times and flamed out. As the cockpit immediately depressurized and the canopy frosted over, Capt Schneider transitioned to his standby attitude indicator to maintain flight and initiated a turn back towards Beale. However, due to an incomplete power transfer to the emergency electrical system, an OFF flag remained in the standby ADI. As he established max-range glide speed on his standby airspeed indicator, he transitioned to the turn and slip indicator and magnetic compass to complete the turn. The cockpit depressurization and resulting pressure breathing made communication with Oakland Center to declare his IFE and state his intentions nearly impossible. After establishing himself on an approximate heading back to Beale, Capt Schneider was able to restart the engine. As he attempted to move the throttle, the engine chugged and started running rough. Leaving the throttle at a low power setting, he continued his max-range glide through the weather using no-gyro vectors, the unreliable standby ADI, the magnetic compass, and the turn and slip indicator. When he broke out of the weather at 15,000', he visually acquired the field and completed a flawless flameout pattern and landing. Maintenance inspection of the engine revealed a faulty fuel control unit. Capt Schneider's prompt, decisive actions and superior flying skills resulted in the flawless recovery of a national asset.

Capt Rich Schneider
1 RS, 9 WG
Beale AFB CA

Aircrew Safety Award of Distinction

Capt Berry, C-130E aircraft commander, 2 ALS, was completing the last flight of the day at the basic airborne course at Lawson Army Airfield, Fort Benning GA. On the first pass across the drop zone, as the paratroopers were exiting the aircraft, Amn Dawson notified Capt Berry that there was a hung trooper. While maneuvering to determine a safe speed and altitude in which to expedite the retrieval of the paratrooper, Capt Berry directed the other C-130 traffic to depart the drop zone and declared an emergency. Meanwhile, in the aft of the aircraft, Amns Carney and Dawson began executing emergency procedures for the towed jumper. The already critical situation was severely compounded when the static line retriever broke away from its mounting point in the aircraft. Because the static line retriever is the only method used to retrieve a towed paratrooper, the loadmasters had to immediately formulate a new plan for retrieval. The loadmasters were further hampered in their efforts by a rigging malfunction that extended the jumper 10' further into the slipstream than would normally be the case. Amns Carney and Dawson quickly improvised a winch rigging by using tie down straps to secure the door area, and with muscle and might physically pulled the helpless paratrooper to safety. The end result was that the trooper was recovered without injury. To safely recover a towed paratrooper without an operational static line retriever required skilled airmanship and professionalism on the part of the entire crew. This aircrew's correct application of the procedures and handling of unknowns in this IFE demonstrated the highest degree of professional military aviation. Their timely actions undoubtedly saved the life of the paratrooper.

Capt Kenneth B. Berry, Capt Herbert S. Brown, 1Lt Susan S. Allen, Sgt Witold Glogowski, A1C Ian C. Carney, A1C Victor L. Dawson
2 ALS, 23 WG
Pope AFB NC

ICBM Crew Safety Award of Distinction

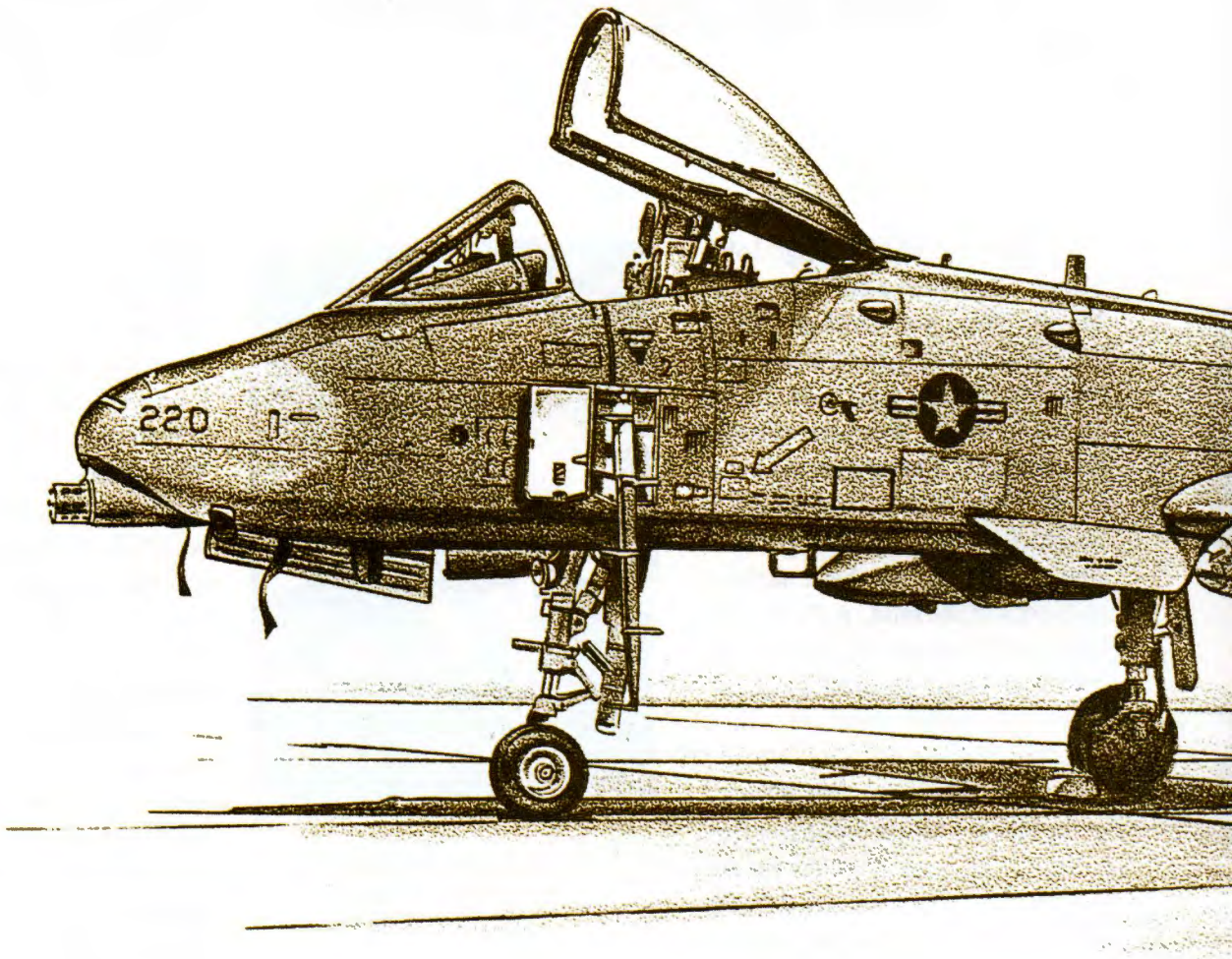
A communications team in the launch control center and their counterparts on a missile launch facility were troubleshooting a data link between the two sites. The missile combat crew monitored the maintenance at the launch facility and conducted their daily inspections of the launch control center. As the crew toured the capsule, they noticed a burning smell. The crew began a systematic search for the cause of the overheat. The crew first checked all forced air cooling ducts to determine that the overheat was not in the capsule's two most important pieces of equipment, namely the motor generator and the air conditioner unit. The crew continued their search. However, the large volume of air that was being circulated throughout the capsule made pinpointing the source quite difficult. The crew began to narrow its search to an area behind the status control panel. Behind the status control panel was the electrical surge arrestor room. It provides electrical surge protection for all the communications equipment in the launch control center and was the area where the communications team had been working. The combat crew processed the communications team back into the capsule, briefed them on the use of safety equipment and procedures, and directed them to investigate the electrical surge arrestor room. Even as the team reported back with no sign of trouble in the electrical surge arrestor room, the burning odor was becoming more intense. The combat crew no longer had just an overheat condition, but an actual fire! A quick glance back at the status control panel revealed smoke emanating from the weapon system printer. The combat crew knew exactly where to reference their technical orders for electrical fire-fighting procedures and expertly performed the required fire isolation actions. This instantly quelled the fire. The combat crew's superior weapon system knowledge and strict adherence to established safety procedures proved instrumental in averting the potentially catastrophic situation.

1 Lt David L. Gildea
2 Lt Rita M. Schell
564 MIS, 341 MW
Malmstrom AFB MT

ICBM Safety Award of Distinction

"My name is Milan, TSgt John Milan. I received a call from 91st Missile Wing Job Control. They informed me that a loaded payload transporter (PT) had been in an accident in the weapons storage area (WSA). The driver had cut a corner short trying to avoid a 2.5 ton truck that was illegally parked. The rig was off the hard surface and stuck in the mud. A PT is a 63' long tractor-trailer rig especially configured to transport war reserve assets. I briefed the flight chief and superintendent, and we responded to the scene. The PT was in the ditch, resting against a fire hydrant, and a major effort would be required to recover the PT and its load. Over the next six hours, I provided technical advice to all agencies involved and suggested a course of action that would safely recover the rig. I supervised such things as the proper placement of a bulldozer for stabilization, placement of wrecker cables, and the proper placement of air bladder lifting bags. As the PT was lifted off the fire hydrant, railroad ties were placed under the wheels and a bridge built so the PT could be driven out of the ditch. After the PT had been lifted and shored so that it no longer listed, the air bags were deflated and the broken fire hydrant was pulled out of the way. I then backed the PT off the bridge and onto the hard road surface. The interior of the PT was inspected to ensure the asset had not been damaged. The system was safe and secure. Prior to moving the rig into the handling area, I accomplished a break-away check, and a brake check to ensure that there were no problems, and then drove the rig into the handling area so that the war reserve asset could be downloaded. Through teamwork and adherence to safety directives, a potential disaster had been avoided."

TSgt John M. Milan
91 OMMS, 91 MW
Minot AFB ND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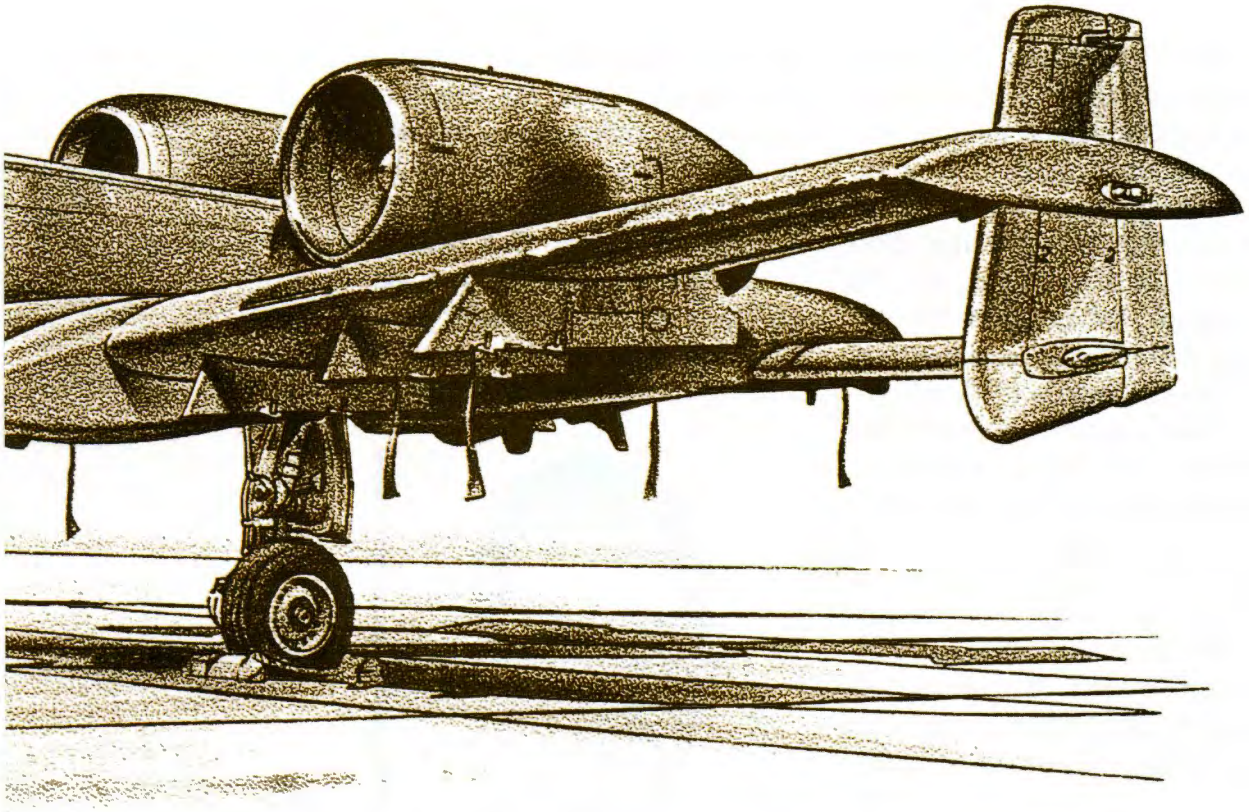


ENGLE

Crew Chief Excellence Award

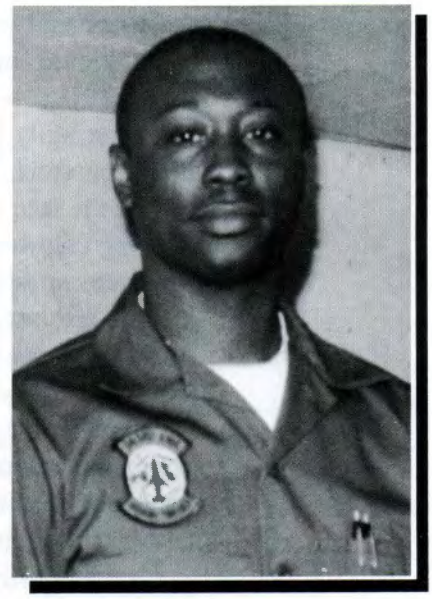
Senior Airman Baker prepared to launch aircraft 80-0038, an F-15C, on a routine training mission. After a normal engine start in the hardened aircraft shelter (HAS) and during jet fuel starter (JFS) shutdown, a seal within the JFS ruptured. Oil streamed from the seal and ignited upon contact with the hot exhaust duct. Flames immediately began to shoot out of the exhaust duct. After calmly alerting the pilot of the fire, SrA Baker directed his launch assistant, A1C Cournoyer, to grab a fire bottle and attempt to extinguish the flames. Following the crew chief's instructions, the pilot shut down both engines, discharged the aircraft's fire bottles and prepared to exit the aircraft. SrA Baker retrieved the aircraft ladder and positioned it as the pilot raised the canopy. The HAS had filled with smoke and fumes, but the fire was thought to be out. SrA Baker assisted the pilot out of the aircraft and directed him to exit the HAS. The fire reignited at this point. SrA Baker moved through the smoke filled HAS to assist in the fire fighting efforts. Once the fire was completely extinguished, he cordoned off the area and directed the fire department personnel as they arrived at the scene. SrA Baker's professionalism, quick reactions and ability to remain calm under pressure minimized damage to a valuable aircraft and prevented any injury.

SrA Larry D. Baker
57 FS, AFI
NAS Keflavik IC

Flightline Safety Award of Distinction

In the middle of preparing an F-16 aircraft for a full paint job, SrA Brown noticed smoke coming from a portable heater outside the paint bay in building 1712. Taking a closer look, he observed flames coming out from around the blower assembly. With aircraft being painted in both bays, there wasn't enough time to get the aircraft out of the hangar. Realizing this could turn into a major mishap, all personnel were notified to immediately evacuate the bays. SrA Brown ran next door to building 1713 and told SSgt Hardy to notify the Fire Department. Meanwhile, Mr Spann disconnected the hoses from the heater and began moving the heater away from the building. SrA Brown grabbed a fire extinguisher and extinguished the fire. With the fire out, Mr Spann was able to reach inside the unit and shut it down. Thanks to valuable training and SrA Brown and Mr Spann's ability to remain calm and work in concert, the situation was terminated without incident. SrA Brown and Mr Spann's concern for co-worker's safety, and dedication to protecting Air Force assets, demonstrates they are deserving of this award.

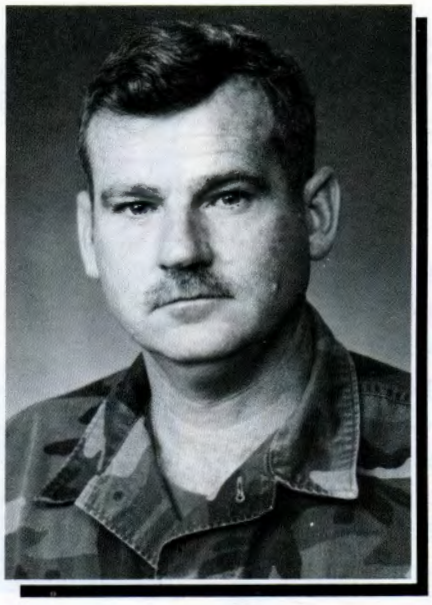
SrA Charles C. Brown
363 EMS, 363 FW
Shaw AFB SC



Mr Matthew Spann
363 EMS, 363 FW
Shaw AFB SC

Ground Safety Individual Award of Distinction

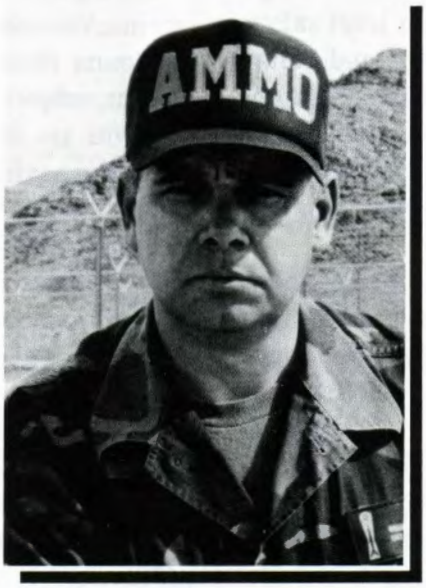
TSgt Lever was performing a vehicle inspection on an M35 (two and one-half ton truck) prior to conducting scheduled rough country all-wheel drive training. Even though the truck had just come out of maintenance, he crawled under the truck and performed a complete visual inspection of the undercarriage — a step not required of or normally performed by vehicle operators. He observed that two of the four nuts that hold the steering control arm to the wheel hub were missing. A quick look around disclosed the nuts sitting on the top of the leaf spring, where they apparently had been overlooked during the recently completed annual scheduled maintenance inspection. TSgt Lever's conscientious, thorough inspection prevented a potentially serious accident. Total loss of vehicle steering control would have occurred if the control arm had come loose while conducting the scheduled vehicle training off-road on challenging terrain, with possible damage or total loss of the vehicle and injuries to the operator and trainer.



TSgt Glenn E. Lever
729 ACS, 388 FW
Hill AFB UT

Weapons Safety Award of Distinction

I was tasked to supervise the assembling and loading of 21 MK-20 Rockeye bombs with FMU-339 fuzes, and 21 CBU-52 bombs with FMU-56 fuzes. We built the MK-20 Rockeyes on a Rapid Assembly Munitions System (RAMS) and loaded those items onto trailers for delivery to the flightline. Once we had all the bombs broken out and assembled, we discovered one CBU-52 with tail plates in a rejectable condition. All the FMU-56 fuzes had been inspected and were safe. Since the bad bomb was on the RAMS closest to the download hoist, we had to remove it before we could proceed any further. We brought over an empty container and downloaded the rejected bomb. I did one last check of the assembled bombs before uploading them onto trailers. It was at this point I realized the lanyard had been pulled, initiating the battery firing sequence for the fuze. I immediately took charge of the situation and evacuated all personnel to a safe distance. Munitions Control function was notified and Explosive Ordnance Disposal responded, safed the fuze, and removed it from service for future destruction. Upon evaluation of this incident, I discovered it was possible for one of the legs of the tri-bomb lifting beam on the RAMS hoist to drag across the adjacent bomb, pulling the lanyard arming the fuze. In the future, all legs of the tri-bomb lifting beam will be secured when not in use. Had I not inspected the bombs one last time, the assembly crew would have moved an armed bomb that may have initiated dropping hundreds of bomblets all over the assembly pad.



TSgt William H. Bunn
57 EMS, 57 FW
Nellis AFB NV

ACC Safety Management Courses

Have you ever wondered how individuals prepare themselves to assume the positions of flight, weapons or ground safety officers and NCOs? One way personnel in ACC are trained is by attending courses taught by the 436 Training Squadron (TS) located at Carswell AFB TX.

Presently, three safety courses are offered: ACC Flight Safety Program Management, ACC Weapons Safety Program Management and ACC Ground Safety Program Management. Each course lasts five days. The intent of each course is to provide an interchange of information and ideas between wing level safety officers and NCOs, Headquarters ACC and Numbered Air Force safety personnel, and 436 TS safety instructors. Course content varies depending on each specific course, but all of them focus on effectively managing the USAF Mishap Prevention Program within Air Combat Command.

The ACC Flight Safety Program Management Course is taught to both wing and squadron flight safety officers and to individuals assigned as flight safety NCOs. In 1993, eight flight safety courses will be taught with each course graduating ten students. This course covers the basic program management of an ACC flight safety program, covering such topics as: inspections and evaluations, Hazardous Air Traffic Reporting (HATR), Mid-air Collision Avoidance (MACA), Birdstrike Hazard Reduction and mishap investigation and reporting.

The ACC Weapons Safety Program Management Course is taught to wing level weapons safety officers and NCOs. This course is taught four times a year, with each class graduating ten students. The weapons safety course covers: nuclear surety program management, explosives safety site planning, inspections and evaluations, conducting mishap investigations and completing mishap reports.

The ACC Ground Safety Program Management Course is taught to both civilian and military safety personnel assigned to wing level ground safety offices. This course is also taught four times a year, each class graduating ten students. This course covers: mishap report writing, inspections and evaluations, how to properly prepare and deal with an OSHA inspection and many other ground safety topics.

All the courses place heavy emphasis on ACC specific requirements. Subject matter experts from both ACC/SE and NAF/SE are present in all courses to provide the most current and up-to-date guidance on any topic covered. The courses are conducted in a seminar/discussion format with a goal of achieving maximum interchange of information between the student, subject matter experts and the instructors.

If you are interested in attending one of these courses or having someone who works for you attend, contact your NAF. ACC/SE controls the quotas for the courses and determines the allocations to each NAF. Once selected for a course, you will receive orders through the classification and training flight of your base. There are 10 funded quotas per class -- all costs are paid by the 436 TS. Any additional quotas are unit funded. Requests for added slots should be worked through your NAF.

The 436 TS also conducts training in areas other than safety. Courses are available for: air weapons officers, target study officers, command post controllers, life support/survival instructors, classroom instructors and Air Force Operations Resource Management System (AFORMS) personnel. Courses in curriculum development as well as computer-based training, using the QUEST authoring system, are also conducted.

As a result of Carswell AFB closing, the 436 TS relocated to Dyess AFB TX in February 1993. If you have a question about the safety courses or any other courses taught by the 436 TS, call 436 TS/FSA at DSN 461-1676. ■

Capt Carl T. DeKemper
436 TS/DOTO
Dyess AFB TX


I'VE PUT THIS JOB OFF LONG ENOUGH.
THIS STORE ROOM IS WAY PAST DUE FER A GOOD CLEANING.
30 CAL.
SMOKE GRENADES
GRE
40MM
BULLETS
GUN OIL
WHAT A MESS.
CLIPS
HOW DO FOLKS LET A PLACE GET LIKE THIS IS BEYOND ME.
©STAN HARRISON 1983
FUSE WIRE
SLUG
MOLE, IS FLEAGLE DOING WHAT IT LOOKS LIKE?
I THINK SO.
SILO SENTINEL
BLAM!
HARRISON

ACColades

QUESTIONS OR COMMENTS CONCERNING DATA ON THIS PAGE SHOULD BE ADDRESSED TO HQ ACC/SEA, DSN: 574-3814

	TOTAL			ACC			ANG			AFR		
	APR	THRU APR		APR	THRU APR		APR	THRU APR		APR	THRU APR	
		FY93	FY92		FY93	FY92		FY93	FY92		FY93	FY92
CLASS A MISHAPS	1	12	4	0	6	5	1	5	7	0	1	1
AIRCREW FATALITIES	0	6	7	0	5	1	0	1	4	0	0	2
* IN THE ENVELOPE EJECTIONS	1/0	10/0	8/1	0	4/0	4/0	1/0	5/0	4/1	0	1/0	0
* OUT OF ENVELOPE EJECTIONS	0	0	0	0	0	0	0	0	0	0	0	0

* (SUCCESSFUL/UNSUCCESSFUL)

CLASS A MISHAP COMPARISON RATE

(CUMULATIVE RATE BASED ON ACCIDENTS PER 100,000 HOURS FLYING)

ACC	FY 92	3.4	1.9	2.0	2.5	2.0	2.0	2.0	2.3	2.5	2.4	2.6	2.5
	FY 93	2.0	3.1	2.2	1.6	1.8	2.1	1.8					
1 AF	FY 92	0	0	0	0	0	0	0	0	0	0	0	0
	FY 93	0	0	0	0	0	9.5	7.9					
2 AF	FY 92	0	0	0	0	0	0	0	*	29.1	16.4	11.2	7.8
	FY 93	0	0	0	0	0	0	0					
8 AF	FY 92	0	0	0	0	0	8.9	7.6	6.6	7.9	5.8	4.4	5.2
	FY 93	0	5.2	3.7	2.8	2.2	1.8	1.8					
9 AF	FY 92	4.4	2.4	3.4	2.6	2.1	1.7	2.2	2.6	2.4	2.7	2.4	2.0
	FY 93	6.7	6.5	4.4	3.3	3.9	3.2	2.6					
12 AF	FY 92	0	0	0	1.5	1.3	1.0	.9	.8	1.4	1.3	1.8	2.1
	FY 93	0	0	0	0	0	0	0					
ANG	FY 92	0	6.7	6.3	8.8	7.1	6.6	5.6	5.5	4.9	4.9	4.9	4.9
	FY 93	0	2.2	2.9	2.1	3.5	2.9	3.1					
AFR	FY 92	0	10.9	7.7	5.7	4.7	3.9	6.7	8.7	7.8	7.0	8.4	7.7
	FY 93	0	0	6.8	5.1	4.2	3.5	3.0					
TOTAL	FY 92	2.3	3.7	3.5	4.3	3.5	3.3	3.3	3.6	3.5	3.4	3.6	3.4
	FY 93	1.3	2.6	2.6	2.0	2.4	2.5	2.3					
MONTH		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP

* (HOURS NOT AVAILABLE)

ACColades

Accolades Honor Roll

HONOR ROLL

Units without a "Command-Controlled" Class A Flight [illegible] since the stand-up of ACC on 1 Jun 92

1 FW	93 BW	128 FW	169 FG	347 FW
4 WG	99 TTW	131 FW	174 FW	355 WG
5 BW	102 FW	132 FW	175 FG	366 WG
7 BW	103 FG	138 FG	177 FG	379 BW
9 WG	104 FG	140 FW	178 FG	384 BW
23 WG	107 FG	142 FG	180 FG	388 FW
24 WG	113 FW	144 FW	181 FG	410 BW
27 FW	114 FG	147 FG	182 FG	416 BW
28 BW	116 FW	148 FG	184 FG	419 FW
31 FW	117 RW	149 FG	185 FG	442 FW
33 FW	119 FG	150 FG	186 RG	482 FW
42 BW	120 FG	155 RG	187 FG	507 FG
55 WG	121 FW	156 FG	188 FG	509 BW
56 FW	122 FW	158 FG	191 FG	552 ACW
57 FIS	124 FG	159 FG	192 FG	906 FG
57 FW	125 FG	162 FG	301 FW	924 FG
79 TEG	127 FW	163 RG	319 BW	926 FG
92 BW				944 FG

TSgt Judy Covert
96 CS
Dyess AFB TX

WEARING SEATBELT SAVES LIFE

The events of the day are etched into my memory forever. That's when I received the call every parent dreads and fears. It was from my daughter-in-law of 3 days telling me my 20-year-old son had been in an automobile accident with an 18-wheeler.

She said my son was driving his pickup truck on a 2-lane federal highway near Santa Rosa NM when his truck hit a patch of black ice and slid into the oncoming semi. The trucker tried to avoid the crash but was unsuccessful and hit the left side of the pickup.

It took emergency rescue people 20 minutes to reach the accident site and another 45 minutes to cut my son out of his truck. He was air evacuated by a Life Flight helicopter to the University of New Mexico Medical Center for evaluation.

His injuries were mostly on the left side of his body corresponding to where the 2 vehicles collided. The amazing part was the absence of brain, head or severe internal injuries. **HE WAS WEARING HIS SEATBELT!** My initial shock at seeing him hooked to various monitors and machines with his limbs suspended from pulleys was soon replaced by relief that he was alive and would soon recover.

Conversations with his doctor and the truck driver convinced me -- the one single factor that saved his life was the proper wear of his seatbelt. The doctor said that without the belt he would have either been thrown from the vehicle or thrown around inside it. Either way, the damage to his body would have been much more extensive.

My son will spend many months in the hospital and many more in rehabilitation learning to walk again. More importantly, he will be here to spend special moments with his wife and family. In time, he will be back to his old self.

My son will always be a reminder of how important it is to buckle up! ■

MSgt Lawrence E. Stulz
906 FG/SEG
Wright-Patterson AFB OH

HOW'S THE BUSINESS?

This afternoon in the safety office, I was on the phone taking one call, had another on hold, and two people were in my office waiting to talk to me. No, there weren't any smoking holes or body parts to talk about. These people were just asking safety-related questions.

Amidst the hectic activity a warm, fuzzy feeling came over me. A feeling similar to that of a proud factory owner, standing on his shipping dock watching his products go out into the consumer world. My safety program was working. My customers were using my service.

Now I know the world of TQM, Total Quality Management, speaks about providing quality services to customers and that the safety office is here to provide a service. However, I didn't realize it was really working until it got so busy.

Somebody out there thought up some fancy words to label a safety program -- proactive and reactive. Reactive is where you count injured bodies and estimate damage costs to figure out where you need to toughen the safety program.

Proactive is when you begin by covering your area of responsibility looking for what may go wrong and most importantly, teaching others a solid safety ethic. Give people the encouragement and motivation to keep safety number one in their operations. That way, you probably won't have a lot of statistics to count up at the end of the year. I am proud to say, our safety program can be called a proactive one.

Some of you are wondering, how do I start a proactive safety program? If your customers are not coming to you, start by taking your program to your customer. This doesn't mean in the form of inspections. A salesman selling mousetraps to a customer wouldn't start off by criticizing the customer; he first shows how his product works, provides better service and best fits the customer's needs. You have to make the customer believe he needs your service. In the field of safety where you have a hidden persuader in the form of consequences like death, destruction, fines or imprisonment, they will believe!

Begin by educating or refreshing the safety memory of your people about the safety program and how it relates to them. If it has been a long time since anyone has used your safety office for information or guidance, it may be time for you to take the program to them. It can start by a simple conversation on the shop floor, but at least let them know that the safety program is there. Establish a working relationship, and just like a better mouse trap, they will beat a path to your door. ■

SIGN OF THE TIMES

Capt Mark A. Martin
HQ ACC/SEW
Langley AFB VA

HM 181 HAZARDOUS MATERIALS PLACARDING CHART (39-FB) and **HM 181 HAZARDOUS MATERIALS LABELING CHART** (38-FB) Printed with permission by **J.J. KELLER & ASSOCIATES, INC.**

As time changes, so do the signs of the time. There are some particular signs that are changing, and everyone who deals with hazardous materials needs to know about them. These are important signs for the fire department and other emergency response personnel who respond to situations involving hazardous items.

The Department of Transportation (DOT) is changing its requirements for placards and labels used to identify hazardous material being shipped by all modes of transportation. Many of the different items requiring placards have their own particular implementation dates, some extend into the late 1990s. However, the new explosives **placards** must be in use by 1 October 93. International **labeling** for explosives was instituted 1 October 92. The old "Explosives A," "Explosives B," and "Explosives C" designations will no longer be authorized after 1 October 93. The new signs look very much like the old ones in size, shape and color; but the information contained in them is more specific and complies with the United Nations Hazard Classification System. The new signs will show both the hazard classification and the division of that classification (class/division 1.1, 1.2, 1.3, 1.4, 1.5 and 1.6). The new signs will also reflect the compatibility group of the item to ensure improper items are not mixed together in shipment. The two charts on the next pages show the new labels and placards that will be required by DOT.

In the past, GSA has procured these labels as standard forms which could be ordered through your local publications office. This will no longer be the case. Units will be required to procure their own labels and placards through commercial sources. DOT provided us with a list of sources who produce these items that are in compliance with their standards.

These new labels and placards have been required since October 1992 for explosives shipments going overseas. For all CONUS shipments after October 1993, these new labels will be required on packages. The new placards will be required on all vehicles and trailers. AFR 127-100, ACC Sup 1, requires the use of DOT symbols for explosives loaded vehicles on base. Units need to procure these new symbols prior to the implementation date. It is also vitally important that all emergency response personnel be familiar with the new symbols and their meaning.

The main guidance for the new DOT labeling and placarding is contained in Title 49, Code of Federal Regulations, parts 172.400 and 172.500. Additional clarification/guidance can be obtained from your base transportation activity.

COMMERCIAL SUPPLIERS OF THE EMERGENCY RESPONSE GUIDEBOOK AND DOT CHART 9, HAZARDOUS MATERIALS MARKING, LABELING & PLACARDING GUIDE

The following list was provided by the U.S. Department of Transportation. Individuals or private organizations interested in receiving copies of the Emergency Response Guidebook (ERG) or Chart 9 may purchase them from one of a number of commercial suppliers. Prices may vary among suppliers with quantities requested. The Department of Transportation does not establish price rates for the ERG or Chart 9. Known suppliers are:

AMERICAN TRUCKING ASSN., INC.
2200 Mill Road
Alexandria, VA 22314
1-800-ATA-LINE
(703) 838-1754
(ERG Only)

COMPLIANCE DISCOUNT CENTER
40 East Delaware Place
Suite 1001
Chicago, IL 60611
(312) 664-2788

HAZARDOUS MATERIALS PUBLISHING CO.
243 West Main Street
P.O. Box 308
Kutztown, PA 19530
(215) 683-6721
FAX: (215) 683-3171

LABELMASTER
5724 North Pulaski Road
Chicago, IL 60646
1-800-621-5808
(312) 478-0900

SCITECH PUBLISHERS, INC.
P.O. Box 987
Matawan, NJ 07747
(908) 583-6132
FAX: (908) 591-8652
ATTN: Mr. Nicolas P. Cheremisinoff
(ERG Only)

BUREAU OF DANGEROUS GOODS, LTD.
P.O. Box 190
North Brunswick, NJ 08902
(908) 422-0700
FAX: (908) 422-8398
(ERG Only)

EMERGENCY TRAINING ASSOCIATES
3 Dorothy Avenue
Baltimore, MD 21221
(301) 682-4920
(ERG Only)

J.J. KELLER
P.O. Box 368
Neenah, WI 54957-0368
1-800-558-5011
(414) 722-2848

UNZ AND COMPANY
190 Baldwin Avenue
Jersey City, NJ 07306
1-800-631-3098
(201) 795-5400
(ERG Only)

INTERNATIONAL COMPLIANCE CENTER, LTD.
2150 Liberty Drive, #6
Niagara Falls, NY 14304
1-800-767-7231
(716) 283-0002
FAX: (716) 283-0119

CARLTON INDUSTRY, INC.
P.O. Box 280
LaGrange, TX 78945
1-800-231-5988
(409) 242-5055
(ERG Only)

BERNAN ASSOCIATES/UNIPUB
4611-F Assembly Drive
Lanham, MD 20706-4391
1-800-274-4888
(301) 459-7666

LAB SAFETY SUPPLY
P.O. Box 1368
Janesville, WI 53547-1368
1-800-356-0783
(608) 754-2345

THE SOURCE
825 Highway 33
Freehold, NJ 07728
ATTN: Mr. Ray Piccolini
(908) 780-0900

HM 181 HAZARDOUS MATERIALS LABELING CHART

CLASS 1 Explosive 1.1 1.2 1.3

*Include appropriate division number and compatibility group

CLASS 1 Explosive 1.4

*Include appropriate compatibility group

CLASS 1 Explosive 1.5

*Include appropriate compatibility group

CLASS 1 Explosive 1.6

*Include appropriate compatibility group

CLASS 2 Divison 2.1

Flammable gas

CLASS 2 Division 2.2

Non-flammable gas

CLASS 2 Division 2.2

Oxygen

CLASS 2 Division 2.3

Poison gas

CLASS 3

Flammable liquid

CLASS 4 Division 4.1

Flammable solid

CLASS 4 Division 4.2

Spontaneously combustible

CLASS 4 Division 4.3

Dangerous when wet

CLASS 5 Division 5.1

Oxidizer

CLASS 5 Division 5.2

Organic peroxide

CLASS 6 Division 6.1

Poison-Packing Groups I and II

CLASS 6 Division 6.1

Poison - Packing Group III

CLASS 6 Division 6.2

Infectious substance

The Etiologic Agent label may be required (42 CFR 72.3)

CLASS 7 I

Radioactive I

CLASS 7 II

Radioactive II

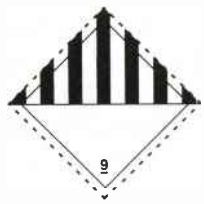
CLASS 7 III

Radioactive III

CLASS 8

Corrosive

CLASS 9



Miscellaneous

SUBSIDIARY RISK LABELS

Explosives
Flammable Gas
Flammable Liquid
Flammable Solid
Corrosive
Oxidizer
Poison
Spontaneously Combustible
Dangerous When Wet

The hazard class or division number may not be displayed on a subsidiary label.

EMPTY

Empty

FOR AIRCRAFT

D.O.T. GENERAL GUIDLINES ON USE OF WARNING LABELS

1. Shipper must furnish and attach appropriate label(s) to each package of hazardous material offered for shipment unless exempted from labeling requirements.
2. If the material in a package has more than one hazard classification, the package must be labeled for each hazard. (Ref. Title 49, CFR, Sec. 172.402).
3. When two or more hazardous materials of different classes are packed within the same packaging or outer enclosure, the outside of the package must be labeled for each material involved. (Ref. Title 49, CFR, Sec. 172.404(a)).
4. Radioactive materials requiring labeling, must be labeled on two opposite sides of the package. (Ref. Title 49, CFR, Sec. 172.403(f)).
5. Labels must not be applied to a package containing only material which is not subject to Parts 170 - 189 of this subchapter or which is exempted therefrom. This does not prohibit the use of labels in conformance with U.N. recommendations ("Transport of Dangerous Goods"), or with the IMO requirements ("International Maritime Dangerous Goods Code") ICAO Technical Instructions, TDG Regulations (Ref. Title 49, CFR, Sec. 172.401).

HAZARDOUS MATERIALS PACKAGE MARKINGS

SAMPLE PACKAGING MARKING

Proper Shipping Name.....ACETONE

UN I.D. Number.....UN 1090

HAZARD WARNING LABEL .....

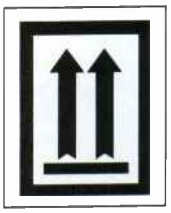
CONSUMER COMMODITY
ORM-D

CONSUMER COMMODITY
ORM-D-AIR

INHALATION HAZARD

CAUTION Unscrew This Bung SLOWLY

Do not unscrew entirely until all interior pressure has escaped through the loosened threads.
REMOVE BUNG IN OPEN AIR. Keep all open flame lights and fires away. Inclosed Electric Lights are safe.



HM 181 HAZARDOUS MATERIALS PLACARDING CHART

CLASS 1

EXPLOSIVES 1.1, 1.2, & 1.3
*The Division number 1.1, 1.2 or 1.3 and compatibility group are in black ink.
Placard any quantity of Division number 1.1, 1.2 or 1.3 material.

CLASS 1

EXPLOSIVES 1.4
*The compatibility group is in black ink.
Placard 454 kg (1001 lbs.) or more of 1.4 Explosives.

CLASS 1

EXPLOSIVES 1.5
*The compatibility group is in black ink.
Placard 454 kg (1001 lbs.) or more of 1.5 Blasting Agents.

CLASS 1

EXPLOSIVES 1.6
*The compatibility group is in black ink.
Placard 454 kg (1001 lbs.) or more of 1.6 Explosives.

CLASS 2

OXYGEN
Placard 454 kg (1001 lbs.) or more aggregate gross weight of either oxygen compressed and oxygen, refrigerated liquid. See 172.504(f)(7).

CLASS 2 Division 2.1

FLAMMABLE GAS
Placard 454 kg (1001 lbs.) or more of flammable gas. See DANGEROUS.

CLASS 2 Division 2.2

NON-FLAMMABLE GAS
Placard 454 kg (1001 lbs.) or more aggregate gross weight of non-flammable gas. See DANGEROUS.

CLASS 2 Division 2.3

POISON GAS
Placard any quantity of Division 2.3 material.

CLASS 3

FLAMMABLE
Placard 454 kg (1001 lbs.) or more gross weight of flammable liquid. See DANGEROUS.

CLASS 3

GASOLINE
May be used in the place of FLAMMABLE on a placard displayed on a cargo tank or a portable tank being used to transport gasoline by highway. See 172.542(c).

CLASS 3

COMBUSTIBLE
Placard a combustible liquid when transported in bulk. A FLAMMABLE placard may be used in place of a Combustible placard on cargo tank or portable tank or a compartmented tank car which contains both flammable and combustible liquids. See 172.504(f)(2).

CLASS 3

FUEL OIL
May be used in place of COMBUSTIBLE on a placard displayed on a cargo tank or portable tank being used to transport by highway fuel oil not classed as a flammable liquid. See 172.544(c).

CLASS 4 Division 4.1

FLAMMABLE SOLID
Placard 454 kg (1001 lbs.) or more gross weight of flammable solid. See DANGEROUS.

CLASS 4 Division 4.2

SPONTANEOUSLY COMBUSTIBLE
Placard 454 kg (1001 lbs.) or more gross weight of spontaneously combustible material. See DANGEROUS.

CLASS 4 Division 4.3

DANGEROUS WHEN WET MATERIAL
Placard any quantity of Division 4.3 material.

CLASS 5 Division 5.1

OXIDIZER
Placard 454 kg (1001 lbs.) or more gross weight of oxidizing material. See DANGEROUS.

CLASS 5 Division 5.2

ORGANIC PEROXIDE
Placard 454 kg (1001 lbs.) or more gross weight of organic peroxide. See DANGEROUS.

CLASS 6 Division 6.1 Packing Group I & II

POISON
Placard 454 kg (1001 lbs.) or more gross weight of Packing Groups I & II. See DANGEROUS.
Placard any quantity of Inhalation Hazard 6.1, PGI.

CLASS 6 Division 6.1 Packing Group III

KEEP AWAY FROM FOOD
Placard 454 kg (1001 lbs.) or more gross weight of Packing Group III. See DANGEROUS.
A POISON placard may be used in place of a KEEP AWAY FROM FOOD placard.

CLASS 7

RADIOACTIVE
Placard any quantity of packages bearing the RADIOACTIVE YELLOW III label. Certain low specific activity radioactive materials in "exclusive use" will not bear the label, but the RADIOACTIVE placard is required.

CLASS 8

CORROSIVE
Placard 454 kg (1001 lbs.) or more gross weight of corrosive material. See DANGEROUS.

CLASS 9

MISCELLANEOUS
A Class 9 placard is not required. However, you may placard 454 kg (1001 lbs.) or more gross weight of a material which presents a hazard during transport, but which is not included in any other hazard class. See DANGEROUS.

DANGEROUS
Placard 454 kg (1001 lbs.) gross weight of two or more categories of hazardous materials listed in Table 2. A freight container, unit load device, transport vehicle or rail car which contain non-bulk packagings with two or more categories of hazardous materials that require different placards specified in Table 2 may be placarded with DANGEROUS placards instead of the separate placarding specified for each of the materials in Table 2. However, when 2,368 kg (5000 lbs.) or more of one category of material is loaded therein at one loading facility, the placard specified in Table 2 for that category must be applied.

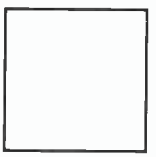
- Division 1.4 (explosives)
- Division 1.5 (blasting agents)
- Division 1.6 (explosives)
- Division 2.1 (flammable gas)
- Division 2.2 (non-flammable gas)
- Class 3 (flammable liquid)
- Combustible liquid
- Division 4.1 (flammable solid)
- Division 4.2 (spontaneously combustible)
- Division 5.1 (oxidizer)
- Division 5.2 (organic peroxide)
- Class 6 (poison)
- Class 8 (corrosive)
- Class 9 (miscellaneous)

SUBSIDIARY RISK PLACARD

Class numbers do not appear on subsidiary risk placards.

FUMIGATED
Placard motor vehicle, freight container or rail car on or near each door when fumigated with Division 6.1 (Poison) or Division 2.3 (Poison gas).

RAIL
Placard empty tank cars for residue of material last contained.



The square background is required for the following placards when on rail cars: EXPLOSIVES 1.1 or 1.2; POISON GAS or POISON GAS-RESIDUE (Division 2.3, Hazard Zone A); POISON or POISON-RESIDUE (Division 6.1, PGI, Hazard Zone A). The square background is required for placards on motor vehicles transporting highway route controlled quantities of radioactive materials (Class 7).

DISPLAY OF IDENTIFICATION NUMBER WHEN TRANSPORTING HAZARDOUS MATERIALS IN PORTABLE TANKS, CARGO TANKS AND TANK CARS.

ORANGE PANEL

PLACARD