The Navy & Marine Corps Aviation Maintenance Safety Magazine

Mech

Summer 2008
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Head on a Swivel

Another Dark Night

The FOD Pouch Caper

The Navy & Marine Corps Aviation Maintenance Safety Magazine

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Mishaps waste our time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This command's goal is to help make sure that personnel can devote their time and energy to the mission, and that any losses are due to enemy action, not to our own errors, shortcuts or failure to manage risk. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is dangerous and demanding enough. The time to learn to do a job right is before combat starts.

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Navy photo by PH3 Aaron Burden

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Front cover: Marine photo provided by 2nd Marine Air Wing

In This Issue:
Personal-Protective Equipment

By LCdr. John Ruane

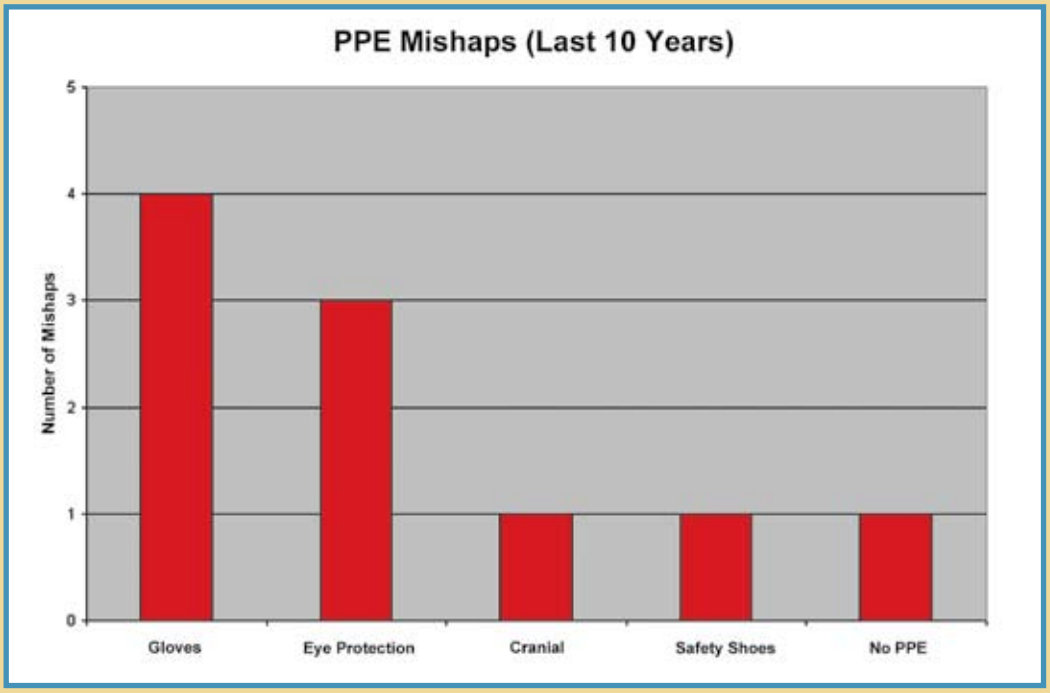
The theme of this issue highlights the importance of wearing required personal-protective equipment. During my 20 years of military service, PPE has saved my life several times, both as a maintainer and as an aircrew member. It also has prevented many injuries.

I first realized the importance of PPE while I was a plane captain with the Tigertails of VAW-125. We embarked with the air wing on USS *Saratoga* (CV-60) for carrier-qualification flights prior to Dessert Storm. Standing on the deck near the foul-line, I signaled my pilots to start the No. 2 engine on the E2-C Hawkeye. With my peripheral vision, I saw an F-14 Tomcat's exhaust nozzles from the corner of my left eye. That's the last thing I remember.

I woke up in medical with my LPO holding his hands about a foot apart. He said, "That's how close you came to death." He filled in the gaps of what had happened to me after I was knocked unconscious. Because of rough seas and an early turn signaled by a yellow shirt to the Tomcat pilot, I was blown several yards across the flight deck, and my head hit a C-2 Greyhound that had both props turning. Fortunately, I missed hitting the rotating prop by one foot. Although my cranial was broken from the impact, my head was protected. I only had a bump on my head and a new appreciation for PPE.

My cranial saved my life and allowed me to share my lessons learned with my squadronmates. This issue of *Mech* is a good example of why maintainers need to

Navy photo by PH3 Christopher Long



Note: This data shows that PPE mishaps are often unreported. Chart does not include hazreps and unreported incidents. Mishaps listed involved significant injuries.

pay special attention to PPE. Death and injuries can occur when we don't properly wear our personal-protective equipment.

When maintainers don't wear their PPE, for whatever reason, they are putting themselves at unnecessary risk. Your family, friends, shipmates, and country are counting on you to complete your assigned duties safely. Do your part to protect yourselves and your shipmates, and you'll save time, money and lives.

HEAD ON A SWIVEL

By AO2 Eric Fields

My day started like any other day on USS *Enterprise* (CVN 65). While the air wing trained for deployment, I prepared for routine flight operations, not knowing what would be in store for me.

The tempo increased as the flight deck transitioned from day- to night-flight operations, which is one of the most critical moments during flight operations for maintainers. For example, aircraft are moving, people are running, and flight-deck coordinators are yelling to make sure everyone is prepared to recover aircraft.

I waited for the next recovery period, so I could de-arm the returning aircraft. As I waited, I started a conversation with three troubleshooters who were standing near elevator No. 2 on the starboard side of the ship. I was familiar with the flight deck, and I knew that, during times of boredom, you easily can become a victim of complacency. I admit that, at the time, I did not pay close attention to my surroundings, which turned out to be a very big mistake.

During the current flight evolution, an FA-18C Hornet taxied to the catapult and directed its exhaust nozzles toward me. I tried to move, but my reflexes were not quick enough. The exhaust from the Hornet picked me up and blew me, headfirst, at least 10 feet

into the starboard catwalk. As I was falling, I thought I was about to die. My thought may have been a little extreme, but at that moment, I wasn't sure where I was or where I was headed-perhaps overboard. However, I landed on my head in the starboard catwalk.

I momentarily lost consciousness from the impact. A medical emergency was announced, and I quickly was taken to medical, where I received seven stitches and treatment for other minor cuts and bruises. In medical, I thought about my situation and how lucky I was to be alive and still on the ship, instead of floating in the ocean.

Several issues could have been corrected to prevent this situation. First, always keep your head on a swivel! People say these words to us everyday. I am living proof that the warning should be taken seriously, because your life depends on it. Second, always wear your personal protective equipment. PPE saved my life and allowed me to share my lessons learned with shipmates. Instead of sustaining massive head trauma, or worse, I received only minor injuries. Additionally, it is very important to always pre-op check your gear before using it. You never can be too cautious about your personal safety. The extra measures you take to protect yourself may just save your life.

Another important lesson I took away from this incident is to avoid complacency. It lurks around every corner and provides a false sense of security during monotonous operations. It is a recipe for disaster. Stay alert and use caution at all times, because the moment you drop your guard is when your luck will change.

After spending countless moments thinking of what I could have done differently to avoid this accident, I concluded that I will practice operational risk management in every task and use PPE to the fullest extent possible. I hope my experience will help someone else avoid a serious injury or worse.

Petty Officer Fields works in the ordnance shop at VFA-86.

Keep Those Goggles Down

By AO3 Aurora Hollie

During the afternoon, my ordnance-loading team completed a turnaround inspection on aircraft 401 on the four row. The tempo was quite fast, and everyone worked together to get the job done.

I was very new at the command and unsure of what to do. One of the ordnance-team members saw me merely standing off to the side. He told me to grab a wing crank and hand crank the starboard wing down so we could load an AIM-9. When I started to crank it down, my ordnance QASO ran over to help. He told me to hold the bottom of the crank and to apply pressure upward, toward the wing, so he could crank the wing down faster.

Because of the fast tempo, the QASO did not wait for me to get a firm hold on the wing crank before he started cranking the wing down. After a few short turns, the tip of the wing crank came out of the socket, swung around, and hit me just above my left eyebrow. My cranial was fastened, but my goggles were up, and I had to have five stitches in my forehead.

Since this incident, my shop has implemented a new policy to prevent a recurrence. When cranking wings up or down, we make sure our goggles are down over our eyes. Even though I received stitches from this accident, it could have been much worse. Impact a quarter of an inch lower could have caused severe eye damage.

Despite the seeming urgency of flight-deck operations, we can't afford to let our guard down when doing aircraft maintenance—whether or not jets are turning on deck. We need to make sure leaders supervise their Sailors to enforce safety procedures. Let's keep the PPE vigilance up, and keep those goggles down.

Petty Officer Hollie works in the ordnance shop at VFA-147.

Cranial Sacrifice

By Capt. Ben Grant, USMC

In naval aviation, a leader never wants to hear about the loss of an aircraft, loss or injury of aircrew, or any incident harming Marines. However, most leaders will ask these questions after an unfortunate event: Are they OK, and were they wearing their personal protective equipment? The second question is drilled into everyone in naval aviation.

Our KC-130J detachment had completed more then five months of our six-month deployment to Al Asad, Iraq. Most of us were veterans of previous deployments here, and the rhythm of daily flight operations was routine. Yet, however unremarkable the mission profiles were, the maintenance Marines approached each day like it was the first day of deployment. They had set a very high standard of pride, proficiency and execution of their daily tasks. As the officer in charge of both Powerline and Avionics, I always was impressed with their efficiency and dedication.

During the summer months at Al Asad, my routine usually involved scurrying from my air-conditioned "can" (our two-man quarters) to the air-conditioned work spaces or to my air-conditioned aircraft. Although we encountered the high-noon, 115-degree temps on the walks to work, the flight line, or chow, we all became adept at avoiding the heat when able. In the meantime, our cadre of dedicated Marines worked on our aircraft in the hot sun on the flight line. They completed maintenance miracles without complaint.

In the early summer, an idea arose within the maintenance department to help the maintenance Marines who worked on the line. If the heat became unbearable, they should have the option of wearing their cranial. It initially made sense; wearing the protective gear is necessary, but if wearing it presented its own set of hazards, things needed to be re-evaluated. However, the detachment officer in charge decided everyone would wear their cranials, regardless. If a Marine was too hot or tired from wearing their cranial in the heat, it was time to take a break and get a drink. That decision soon would prove its worth.

A small team of our Marines washed the accumulated sand, dust and crud from one of the aircraft in mid-July. Like all aircraft here, the Hercs pick up their share of dirt, and no one wants that stuff building up in the wrong place. The maintainers used a B-5 stand for a platform from which to water blast the crud off the bottom of the wing. The Marine on the stand leaned on the railing, just a bit, to reach that last little bit of dirt. The side rail gave way, and the Marine tumbled headfirst to the concrete. The only thing that broke the 9-foot fall was his cranial.

Initially quite stunned, he was taken to several medical facilities on Al Asad and then flown to Balad. He subsequently was transferred to the medial facilities in Germany for higher-level care. Though stunned, strained and not happy, he appeared to have gotten off lucky. However, the higher-level neurological care revealed a slight skull fracture (a serious injury in its own right, regardless how slight). Although the Marine wanted to come back and finish the deployment with his fellow Marines, he had an early one-way ticket home. He received proper medical care and is recovering well.

The Marine in this story was wearing his PPE, so this incident has a dual-happy ending. His cranial most likely saved his life, and the medical recommendations to give him higher-level care, without delay, revealed the true nature of his injuries in minimal time. It's chilling to consider this Marine could have been killed or injured gravely if he hadn't been wearing his cranial. The repercussions of an optional cranial policy immediately would have come under scrutiny.

The B-5 stand did come under scrutiny. The Marine crew that used it consisted of very experienced maintainers who should have made sure the railings were inserted fully. They thought the rails were installed. None the less, all of our stands were inspected to make sure some unseen defect didn't exist. In this case, either the railing was not installed properly, or the Marine inadvertently, while washing the aircraft, lifted the railing out with his body motion.

The cranial itself was fractured and made unserviceable. It now hangs in Maintenance Control as a testament of its value. Every maintenance department in naval aviation should have such a reminder, so someone can point to it the next time an optional wear policy is suggested. We should be reminded by this incident and every other account that *Mech* shares with the fleet, as well as myriad PPE-related posters that exist in every squadron. Taking PPE for granted is taking our Marines and Sailors lives for granted, and we can't afford to do that.

Among our many missions in Iraq, we have the solemn duty of flying fallen U.S. service members out of Iraq to Kuwait for their final flight home. It's tragic enough when this duty is the result of enemy fire. It would be inexcusable if it was because we lacked or misused PPE while working on aircraft.

Capt. Grant is the officer in charge of Powerline and Avionics at VMGR-252.

Analyst comment: *Fall protection guidance is found in OPNAVINST 5100.19E, Vol.1, Part 2, Chapter 12, and in OPNAVINST 5100.23G, Chapter 13, par 1303. It states that every command shall promote a safe work environment for personnel working at heights where there is a possibility of a fall from any height onto dangerous equipment, into a hazardous environment, or onto an impalement hazard. These are resources, not definitive instructions, for specific application of PPE at a unit for their evolutions. Safety officers should make sure this area is addressed in local SOPs or instructions.*

Senior Chief Chenard is a maintenance analyst at the Naval Safety Center.

PPE Works... If Worn

By Ltjg. Ernesto Villalba

Most of the time, instructions are a firm base in which we can practice our operations safely. They do not account for every scenario. For example, we preflight aircraft according to NATOPS procedures. In the E-2, we inspect the hydraulic filters and reservoirs, as NATOPS prescribes. However, we have not preflighted our aircraft completely if we miss a hole in the fuselage just inches above the hydraulic reservoir.

Good headwork and technique involves inspecting the required items, as well as scanning the area around them. Good headwork and technique normally is acquired through training, practice, experience, and articles like this.

Navy photo by PHAN Michael Banzhaf

A Sailor in our squadron experienced a second-degree burn while on cruise in 2007. Required personal-protective equipment, better known as PPE, was worn during the incident. The following scenario is a summary of what happened. It highlights the importance of thinking about what we are doing, the environment it is being done in, and its potential hazards. The incident involved burns to the hands and arms of a maintainer working on the flight deck.

The incident occurred when an airman was scrubbing the flight deck near a catapult. She was wearing gloves but had the sleeves of her flight-deck jersey rolled up to her elbows. What the airman did not consider was that the catapult tracks get very hot after early morning "no loads" and the raging heat of the Arabian Gulf sun. She slipped and fell on the tracks, incurring second-degree burns to her forearm.

In this case, if the airman had had her sleeves rolled down, it likely would have lessened the severity of the burns. Outside of flight quarters, rolling sleeves down while scrubbing the flight deck might not be defined as a requirement anywhere. However, it certainly stands to reason that catapult tracks can get extremely hot, and you should be prepared when working near them.

Temperatures on the flight deck rise above 110 degrees during summer combat operations in the Arabian Gulf and Arabian Sea. It is tempting for many flight-deck personnel and aircrew to relax their PPE requirements because of the heat. However, we must make sure we add a dash of headwork to the full measure of flight-deck regulations to prevent injuries. All hands must wear proper PPE to make sure all tasks are completed safely.

As a baseline, PPE should be the minimum items required for the job. The environment always should be taken into account, as well. Headwork and technique often is missing from procedures. As leaders, we should look out for these issues, share our lessons learned as often as we can, and avoid incidents like this one.

Ltjg. Villalba is the ground safety officer at VAW-112.

How **Heavy** is a Hangar Door?

By AZ1 Shannon Van Dorn

Summer thunderstorms are very common in Florida. However, the intensity of these storms can surprise anyone who is not prepared for them. Night check had been hectic during our drill weekend, and it would get worse before this night was over.

We had had several launches and recoveries with minimal coverage, and we were in thunderstorm condition II. The weather quickly turned worse with thunder, lightning, pouring rain, and hail. Lightning was reported within 5 miles of our hangar. I was behind the counter in Maintenance Control, while my crew completed maintenance. I decided to close the hangar doors to keep the hangar deck from getting soaked and becoming a hazard. The hangar door only could be closed by walking next to it, while simultaneously pressing the button on the outside of the door. This button is located at the moving end of the door. As I walked with the door to close it, I got soaked from the rain. Because the lightning seemed to be extremely dangerous, I decided to walk inside.

With my arm reaching outside the door, I continually pushed the close button. I thought the movement would be slow enough so I could walk backward, while straddling the track. Before the door closed fully, though, my foot slipped on the wet cement and lodged in the door track. Thankfully, I was wearing steel-toed boots. The door went over the steel toe and continued to close. Immediately, I released the button, but movement continued several more inches. I put the door in reverse to remove my foot.

I broke the fourth metatarsal bone and had significant bruising on top of my foot and around my ankle. I had to use crutches for the next six weeks.

Three lessons came from this incident. I should have closed the hangar doors as soon as we got word of an approaching thunderstorm. I should have walked on the correct side of the door to avoid increased risks—a detail which I did consider. When the lightning became severe, I should have aborted the attempt to close the doors and just let the hangar deck get wet.

Petty Officer Van Dorn works in Maintenance Control at VR-58.

Good

PPE protects maintainers during hazardous tasks.

Bad

It's illegal to alter your cranial with this type of lens.

Ugly

Thumbs up or hosed up?

Another Dark Night

By AMAN Alejandro Ruvalcaba

I had been in the line division for five months and already felt comfortable working around the Prowler. But this being my first combat deployment to Al Asad, Iraq, I knew we'd be busy getting aircraft ready for a heavy schedule of missions. This was an opportunity to prove my worth under stressful conditions, and I was more than ready! The day started like any other, but I would end it with a painful reminder that safety always is paramount.

In the late evening, I was told that our scheduled aircraft had a problem, and we were going to launch the standby. The plane captain tasked me to clean the canopies. Without hesitation, I grabbed some rags, and climbed the port boarding ladder, and began to work. When I finished the port side, I climbed down and walked over to the starboard side. Before climbing the boarding ladder again, I checked the top step for security and made sure the pin was engaged, just like I always do. I proceeded up and began to clean the aft canopy. I just was about finished but needed to reach a little higher to get the last spot. I moved forward and placed both feet on the top step of the boarding ladder. I stood there cleaning for about 10 seconds, and the next thing I knew, I was lying on the ground with my left shoulder and arm in severe pain.

Two other ground crew saw what had happened and came running up to ask if I was OK. I tried to sit up but couldn't because of the pain. I did manage to glance down at my left arm and noticed it had been extended about 4 inches, and my fingers were close to my knee. As I lay on the ground waiting for an ambulance, I noticed a large crowd around me. They told me not to move and just to lie still. Within 10 minutes, I was being whisked away to the hospital for X-rays. Later that night, the doctors told me that I had dislocated my left shoulder and would be out of the fight for a while.

An investigation of the step revealed that the locking pin was worn out and was not seated properly, which caused the step to disengage. This in turn caused me to fall 13 feet, landing on my left side. For my efforts, I received one day SIQ and six weeks limited duty.

Even when working in a combat zone, safety is critical. All efforts should be made to ensure we stay healthy and in the fight. Had I gone one step further, pulled down on the step to check for proper security, and checked the locking pin on which I was depending so dearly, I probably would have prevented this injury.

Airman Ruvalcaba works in the line division at VAQ-142.

Crew Rest . . . Not Just for Pilots

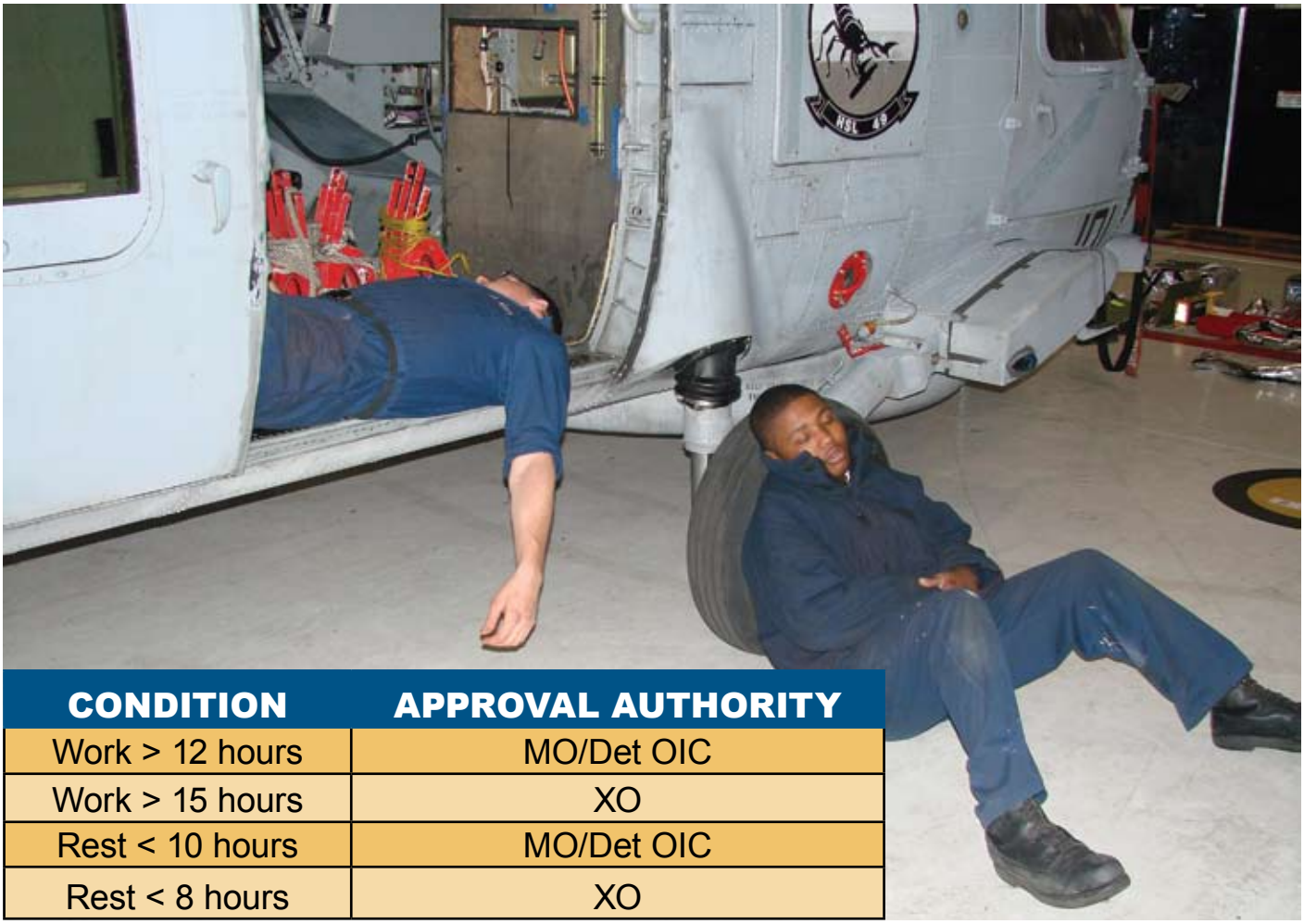
By LCdr. Ryan Dunn

If those who fly aircraft are governed by rules that dictate how long their crew day is, why isn't there a common risk management tool for those who work on aircraft? Should we accept a fatigued aviation machinist's mate replacing a vital engine part, after working 15 hours straight, just because he or she isn't flying an aircraft? Should we assume good old deck-plate leadership has a firm grasp on what their people are doing and know when to cut them loose when it pushes the safety envelope?

I don't think so. Inevitably, 100 percent of our leadership doesn't make the right decisions concerning risk management all of the time. None of us do. So what are the options?

HSL-49 has fought the problem of potential fatigue, associated with maintenance personnel's extended working hours, by putting an instruction in place that takes risk management to a new level. HSL-49's commanding officer directed his leadership to come up with a tool that enhances the quality of maintenance and the

Navy photo by Ltjg. P.J. Perrott, HSL-49 Scorpions public affairs officer



CONDITION	APPROVAL AUTHORITY
Work > 12 hours	MO/Det OIC
Work > 15 hours	XO
Rest < 10 hours	MO/Det OIC
Rest < 8 hours	XO

safety of its personnel by standardizing risk management approval for personnel who work extended hours. The rules are simple and easy to follow—personnel working more than 12 hours require department-head approval. Individuals working more than 15 hours require executive officer's approval and should only be requested "on very rare occasions." Not only are we concerned about working hours, but rest in between shifts is just as important. For personnel with less than 10 hours off, the department head must be notified, and permission for personnel to be granted less than eight hours off must be requested from the executive officer.

This instruction forces our leading petty officers, chiefs, division officers, and department heads to make risk decisions at the right levels by taking a closer look at personnel and ensuring they don't put themselves, aircraft, and aircrew at unnecessary risk. We owe it to our maintainers, aircrew, and aircraft to continually strive for ways to mitigate risks, in order to prevent on- and off-duty mishaps. This tool wraps all four principles of ORM together to effectively prevent those holes in the Swiss-cheese model from lining up. It's working . . . feel free to try it!

LCdr. Dunn is HSL-49 Det. 4 officer in charge.

From the MO:

OPNAVINST 3710.7T, 1 Mar 2004, pg 8-6, para 8.3.2.1.1, under Flight Crew and Flight Support Personnel, states, "Commanders should make available eight hours sleep during every 24-hour period. Schedules will be made with due consideration for watch standing, collateral duties, training, and off-duty activities."

Definition for "flight support personnel" is "personnel immediately involved in maintenance... of aircraft," as found on page 32.

Cdr. Bert Ortiz is the Naval Safety Center's maintenance officer.

Aeromedical Feedback

Maintainer fatigue is a tough nut to crack and has been ignored far too long. Congratulations to HSL-49 for taking an important first step toward solving the problem. Here are some additional points to consider as you address maintainer fatigue and strive to maximize your maintenance team's effectiveness.

If supervisors are to make good decisions regarding work hours, they also must understand fatigue's effects on performance. Fatigue is four times more likely to contribute to workplace impairment than drugs or alcohol. Are you aware that a typical person's work performance rapidly declines after about 15 hours of wakefulness? At 18.5 hours, the effects of fatigue may be compared to the effects of a blood-alcohol concentration of 0.05 percent. So, if you're the XO and have to decide whether to extend work beyond 15 hours, make sure you understand the magnitude of the increasing risk.

It's a good idea to be familiar with fatigue effects due to working nights, shift work, and circadian rhythms, so that these factors also can enter the decision process. Nights are particularly hazardous because human brains are "programmed" to be awake during the day and asleep at night. This means that people working nights often are struggling to maintain alertness levels that come more naturally during the day. Supervisors need to consider what time of day to schedule the most difficult maintenance tasks, especially if workers already are fatigued from long hours, sleep deprivation, shifts, or jet lag.

Every member of the maintenance team should understand fatigue and its effects. It does little or no good for a supervisor to cut short a long day, only to have personnel opt to party or do anything else other than sleep. Everyone's priority should be to get some sleep.

Flight surgeons can be an excellent resource regarding fatigue; they have access to tools that can help you formulate your war on fatigue. With increased awareness of fatigue and its impact on safety, we all can work more safely and effectively. For more information on fatigue and its effects, visit the Naval Safety Center's Aeromedical division website at:

http://www.safetycenter.navy.mil/aviation/aeromedical/default.cfm

There are several links relating to fatigue, including one where you can order a copy of the Aeromedical Fatigue Video CD. Of course, you also can contact us via phone or e-mail.

Cdr. Kevin Brooks is an aeromedical analyst at the Naval Safety Center.

The FOD Pouch Caper

By AE2 Jacob Perkins

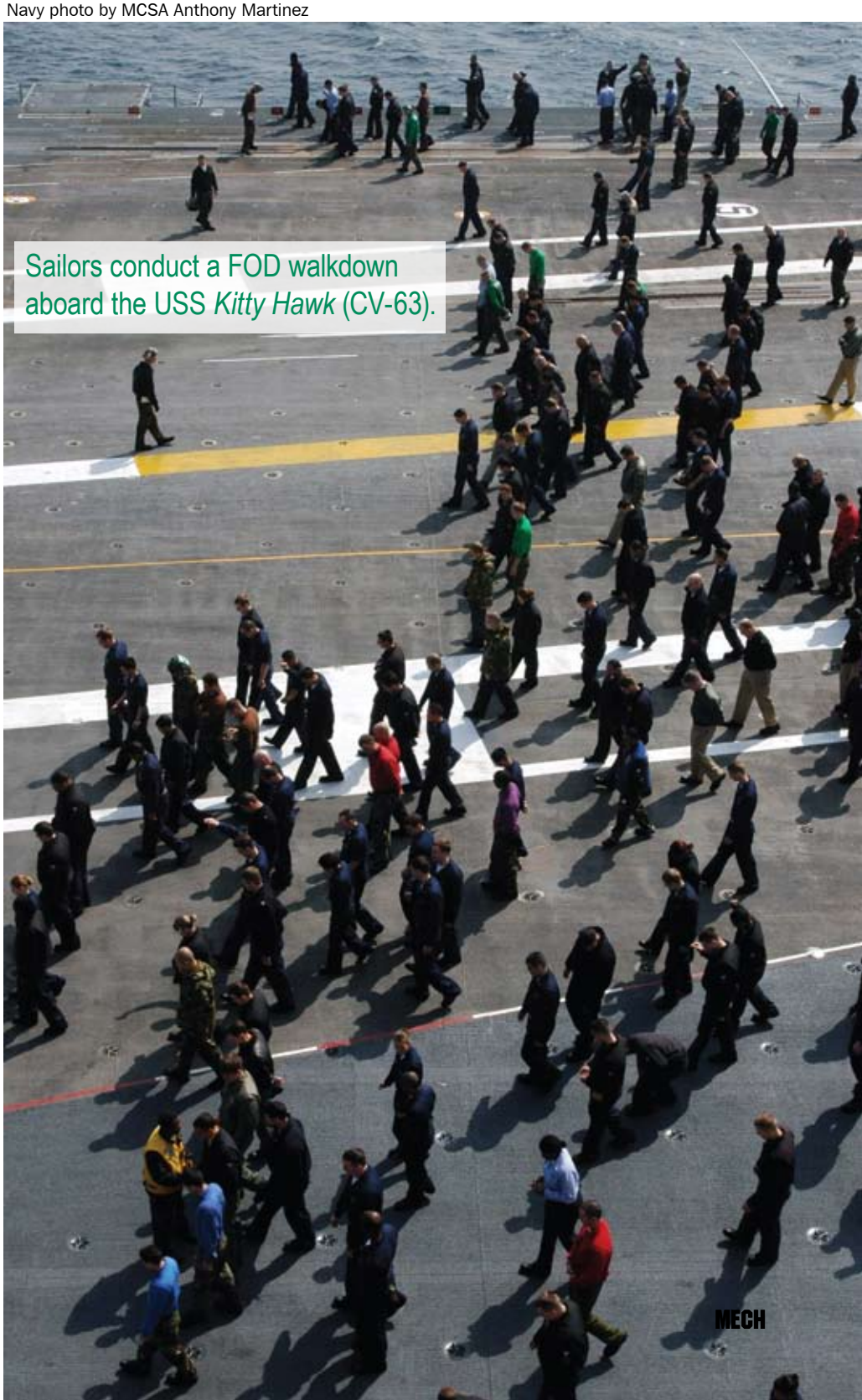
Our flight-deck pants pockets are sewn shut to prevent us from carrying any unauthorized gear from the shop to the flight deck or into the aircraft. People subsequently carry personal gear in their FOD pouches, which are meant only for FOD, nothing else. Using the FOD pouch for anything but FOD defeats its purpose.

Before my evening shift with VAW-115 on USS *Kitty Hawk* (CV-63), I decided to use my FOD pouch to carry a set of keys from berthing to my work center. I figured it would be fine because several people I knew used their pouches to carry MP3 players, money, and other personal gear. Because of the inconvenience of our sewn-shut pockets, I jumped on the bandwagon.

In my hurry to get to work, I locked my keys in my locker without realizing it. I went to work and never thought to deFOD my pouch. I completed my shift and never checked to see if my keys still were in my pouch. I was getting ready for bed that night when I first realized my keys were not in my FOD pouch. I quickly started searching everywhere I had been that day. "Where might I have placed my keys?" was the thought running through my head.

I remembered being on the flight deck earlier in the morning for the Alert 30 man-up of our aircraft, and later, I was in an aircraft in the hangar to remove an aircraft part. I also remembered I had run around

Navy photo by MCSA Anthony Martinez



Sailors conduct a FOD walkdown aboard the USS *Kitty Hawk* (CV-63).

to accomplish many tasks in a minimal amount of time. With all that jostling, my keys could have fallen out of my FOD pouch.

This situation posed a serious threat, not only to our alert aircraft but to all the aircraft on deck. I immediately went to my work center and informed my LPO, who reported the incident to Maintenance Control. I knew it would be better to alert my chain of command and risk getting in trouble for my foolish act, than to let planes fly with possible FOD in them. FOD is a serious and potentially fatal matter.

Because of my foolishness, the entire air wing was on the verge of being grounded. Since we were in an Alert 30 status, the situation was even more critical. What if the alert was called away? The aircraft would not be able to fly. All available AEs and Maintenance Control personnel had to stop what they were doing and spend time on a wild-goose chase because I hadn't done the right thing. It was a poor decision on my part.

The keys eventually were found, after my lock was cut. If I had thought to have that done sooner, I could have avoided the attention and stress that was generated. Also, I should have used ORM, or as some call it, "common sense," and not put the keys in my FOD pouch when I knew, deep down, it was wrong. These needless events could have been avoided. Although my keys were in my locker and never actually entered the aircraft or flight-deck area, the fact they could have, is a big deal.

I strongly believe that honesty is always the best policy, regardless of what trouble we may incur for telling the truth. I'd rather take the heat for my mistakes, than to cover up the event. I caused some loss of trust by failing to adhere to what I knew was right and because of my poor judgment call. If we can't trust each other to display integrity, especially in important matters like FOD prevention, then we may have a bigger problem to deal with. I challenge everyone to take a step back and examine themselves. Are there areas where we are failing to do the right thing, taking the convenient route, excusing our actions, and disregarding the threat we pose to the safety of those who are depending on us?

Remember, FOD pouches are for FOD.

Petty Officer Perkins works in the AE shop at VAW-115.

When Sparks Fly

By AM1(AW/NAC) Pedro Blandin

After a long day of dealing with maintenance and supply issues in the airframe shop, I went to the flight line to tell one of my workers to finish up some paperwork. I observed an AE2 and AE1 performing a battery swap on the aircraft and decided to give them a hand. I already had completed several maintenance tasks during the day, including a brake change with a broken stem and several airframe inspections. To top it off, the end of the shift quickly was approaching.

I still decided to lend a hand on the battery swap. The batteries were taken out of the boxes, inspected (noted by serial numbers indicating their new position), and the plugs were removed. The AE2 handed me the first aircraft battery, and the AE1 quality-assurance inspector verified the part. I grabbed the new battery, turned it around, and placed it on the ladder. I didn't notice that the protective plugs were removed.

I turned the battery around again, and as I placed it on the aircraft, the terminals touched my belt buckle and created an electrical arc. I did not see the discharge, but the AE2's facial expression indicated something significant had happened. I realized that the metal part of my buckle had melted as a result of the contact. This outcome reemphasizes the value of following safety procedures at all times. Looking back, I probably should have let the professionals handle this one.

Petty Officer Blandin works in the airframes shop at VR-58.

When Pigs Fly

A New Cranial in 2010

By Jim Janousek and Valerie Bjorn

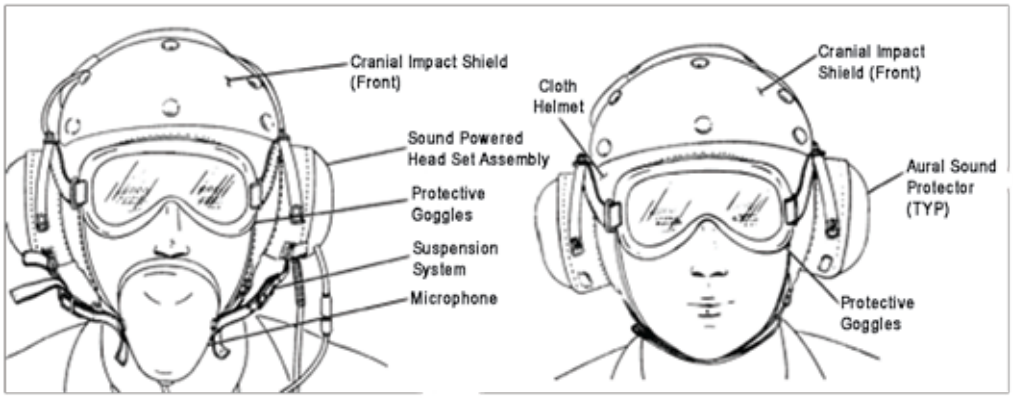
'Good enough' often becomes the basis for 'the way things always have been done.' In the case of the current flight-deck cranial, what was good enough for maintainer head and hearing protection in the 1950s no longer is good enough to keep maintainers safe in 2008.

The first generation of today's flight-deck cranial, designed by Capt. Ralph L. Christy, Jr., a Navy flight surgeon, and Mr. David M. Clark, of the David Clark Company, used "Mickey Mouse" earmuffs in the original cranial-helmet system. This "state of the art" head and hearing protection was worn to protect against the F2H-2 Banshee's twin Westinghouse J34 turbojet engines, capable of producing 3,140 pounds of thrust each.

USS *Theodore Roosevelt* (CVN-71), VFA-87, 2006

USS *Franklin D. Roosevelt* (CVN-42), 1953
Photo compliments of Daniel M. Christy, son of Capt. Ralph L. Christy, Jr., deceased Navy Flight Surgeon who helped David M. Clark design the original sound protector.

As time progressed, so did naval aircraft. Dialing the clock ahead 53 years, FA-18s carry two General Electric F404-GE-402 afterburning engines, capable of 18,000 pounds of thrust each and producing up to 150dB of noise! Unfortunately for the maintainers of these powerful and capable aircraft, time nearly stood still. Modern aviation-maintenance crews wore nearly the same head and hearing protection as their Banshee brethren generations earlier.



HGU-24/P HGU-25(V)2/P

Flight deck crewman's helmet assembly (cranial)

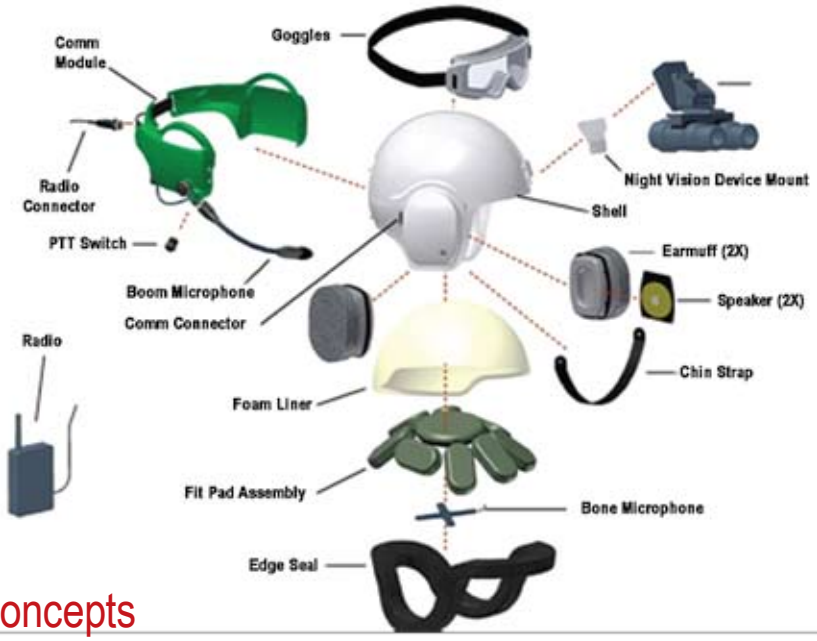
The HGU24/P and HGU-25(V)2/P are commonly and collectively known as the cranial. While this design has withstood the test of time, it fails to meet nearly all modern-safety standards for hearing protection, impact protection, and electrical shock prevention, and it fails to support several key 21st century mission scenarios.

CPG3 Command Master Chief, ABHCM(AW/SW) Wynn Young, was among the first to report hazardous shortcomings of the cranial. He developed a point-paper, which highlighted the cranial's failure to support NAVAIR 00-80T-106, requiring the use of night vision devices (NVDs) on amphibious flight decks, as well as the 'can do' spirit of the fleet maintainer. The paper noted that fleet solutions, however noble and well-intentioned, often result in non-standard, unsafe practices. NVD attachment to the cranial often results in poor NVD eye alignment, vision and face hazards, and cracked cranial-impact shields.

Further, NAVAIR AIR 4.6, Human Systems Department, conducted surveys of more than 1,000 flight-deck personnel on board CVNs, LHAs, LHDs, and across fleet squadrons. The survey included a detailed assessment of cranial-helmet fit and maintenance condition (e.g., earmuff headband tension, earcup foam and cushion integrity), earplug use and insertion depth, and head-size measurements. Worn without earplugs, the cranial provides approximately 21 dB of noise attenuation when correctly fit, worn, and maintained. All survey subjects reported wearing a cranial helmet with earmuffs, but 75 percent of subjects were issued a questionable size (most wore the largest of four sizes available), and 41 percent of earcup cushions and foam inserts were deteriorated, hard, creased, or missing. Many maintainers, who were issued even the largest of the four cranial sizes, reported being in severe pain after wearing them 5 minutes.

Left: One of several fleet "fixes" to NVD mounting (note poor eye alignment, snag hazards). Right: Crack in cranial impact shield from NVD mount.

Largest cranial does not fit all (cranial is hard to clean and standard earcup seals harden, crease, and leak noise).



Creare Incorporated Design Concepts

ATI Incorporated Design Concepts

A detailed cost analysis found that the cost to build, maintain and replace the old cranial was not a good value. Survey data showed approximately two hours are required to build one complete cranial system from scratch, with an additional 45 minutes needed to configure NVDs. Maintenance averaged an additional 25 to 45 minutes per cranial. From 2000 to 2004, about 750,000 individual parts were purchased for the cranial, averaging 187,500 parts per year. Currently, up to 22 individual parts are ordered to configure a cranial (not including NVDs and mountings). These results strongly supported a decision to develop and field a new state-of-the-art cranial.

As a result, NAVAIR worked with two vendors, Adaptive Technologies, Inc., (ATI) and Creare, Inc., to develop new FDC-design concepts. Both vendors developed FDC prototypes designed to meet or exceed initial performance requirements. The Naval Safety Center then hosted multiple open forums with the fleet to gather firsthand feedback on the ATI and Creare prototypes and to iron out key performance requirements. These fleet inputs, together with NAVAIR technical requirements, were approved in early March 2008. The 65-page performance specification for the FDC was approved as PMA202-000/R-0.

This performance specification establishes minimum performance and validation requirements for a modular FDC helmet to be worn by aircraft handlers and maintainers working in, on and around military aircraft positioned throughout global-climate ranges shipboard and ashore. The FDC will meet OPNAVINST 5100.19 and 5100.23 safety requirements, and provide improved hearing protection (about 43 dB), speech intelligibility, ANSI Z89.1-1997 impact protection, electrical-shock protection, a stable NVD-mounting platform, and be compatible with CBR protective clothing. The FDC will be modular in design to allow tailoring to various work environments and to reduce maintenance labor man-hours and logistical burden, including a FOD-free design (no clips to remove) and pre-applied reflective tape by the vendor! The plan is to offer the new FDC-cranial system as an individually-issued item to improve sizing fit, comfort and hygiene.

In late March 2008, the FDC program was authorized to move into the systems design and development (SDD) phase. In this phase, both ATI and Creare will conduct laboratory-performance validation testing and initial fleet assessments. Fleet assessments are planned for third quarter FY09. A Milestone "C" decision to field the FDC is scheduled first quarter FY10.

Mr. Janousek works at NAVAIR, Code 4.6.7.4 and Ms. Bjorn is with Human Systems, Code 4.6.

Flight, Flight-Related, and Ground Class A and B Mishaps 2/27/2008 to 06/09/2008

Class A Mishaps

Date	Type Aircraft	Command
02/27/2008	E-2C	VAW-125

Port prop failed to feather during FCF and subsequent emergency landing.

Date	Type Aircraft	Command
03/04/2008	T-45C	COMTRAWING 1

Aircraft crashed during landing at NAS. Both pilots ejected.

Date	Type Aircraft	Command
03/14/2008	T-34C	VT-6

Mentor struck side of mountain. Two fatal injuries.

Date	Type Aircraft	Command
04/11/2008	FA-18C	VFA-37

Two aircraft flew into thunderstorm with hail. Both aircraft damaged. No injuries.

Date	Type Aircraft	Command
05/15/2008	AV-8B	VMAT-203

Aircraft had engine failure during air to surface sortie. Pilots safely ejected.

Date	Type Aircraft	Command
05/20/2008	T-45C	COMTRAWING 1

Aircraft crashed during night practice landing. Two aircrew ejected.

Date	Type Aircraft	Command
05/31/2008	C-37B	VR-1

Hail storm damaged two aircraft parked on flight line.

Date	Type Aircraft	Command
05/31/2008	C-130T	VR-53

Hail damaged three aircraft.

Class B Mishaps

Date	Type Aircraft	Command
03/21/2008	T-45A	VT-21

Bird strike in landing pattern. Pilot injury.

Date	Type Aircraft	Command
03/26/2008	FA-18E	VFA-106

Aircraft had left engine fire indications during flight.

Date	Type Aircraft	Command
04/05/2008	FA-18A	VFA-204

Hornet departed paved surface while clearing active runway.

Date	Type Aircraft	Command
04/06/2008	FA-18F	VFA-11

Main landing gear brake assembly came apart during carrier landing. One main tire damaged.

Date	Type Aircraft	Command
04/26/2008	FA-18C	VFA-192

Parked aircraft blown into parked aircraft on flight deck.

Date	Type Aircraft	Command
04/30/2008	T-45C	COMTRAWING 1

Goshawk ingested small bird in left intake. Aircraft safely recovered.

Date	Type Aircraft	Command
05/05/2008	AV-8B	VMA-211

Maintainer's cranial ingested by engine during high-power turns. No injury.

Date	Type Aircraft	Command
06/04/2008	P-3C	VP-46

FOD ingested during ground maintenance engine turn.

Date	Type Aircraft	Command
06/09/2008	C-40A	VR-58

Aircraft port wing struck aircraft stair truck. Wing damaged. No injuries.

Printed as a supplement to *Mech* from
Naval Safety Center Data
Cdr. Ed Hobbs
For questions or comments, call LCdr. John Ruane
(757) 444-3520 Ext. 7220 (DSN 564)

Dual Generator Failure Off the Cat

By AE1(AW) Dennis Surina and AE2(AW) Timothy Ross

Early in the morning, two days before Christmas, I walked into the shop for the normal morning pass down. Night shift reported that all nine jets on board were FMC, but aircraft 300 had diverted to Kuwait because of a dual-generator failure.

The night-shift supervisor explained that the aircraft lost both generators on the cat shot, and the flight controls reverted to a backup mechanical mode.

We flew two of our QARs, an AE1 and AD1, off the ship in a helicopter to change both generators and the aircraft battery. The rest of the morning was uneventful. We had our usual morning-maintenance meeting and then brainstormed various ideas to get aircraft 300 returned to the ship.

After chow, a call came for me, the LPO of the AE shop, to report to Maintenance Control. The MMCO, MMCPO, and desk SCPO told me they had spoken to our QARs; the No. 2 circuit-breaker panel had shorted out and burned some connectors and wire bundles in panel 10, right. They told me to make a list of everything in the panel that would need to be replaced.

At this point, we were not certain what needed to be done to return the aircraft to service. I wrote a list of all possible parts that might be needed for the repair, including a wire harness, eight connectors, 30 feet of miscellaneous wire, a wire-connector repair kit, and two new circuit-breaker panels.

The rescue detachment, which included a safe-for flight chief, three AOs, an AE2 and an AT2, departed the ship when we pulled into Jebel Ali for port visit. We took a two-hour bus ride to an air force base, followed by a two-hour flight in a C-2 to Kuwait. Our detachment

arrived at Ali Al Salem Air Force Base at 2300. We checked in with the ground force that already was there, got barracks rooms, and hit the rack for the night.

The next morning, we towed our aircraft into an old, bombed-out hangar and investigated the jet. It was configured for a combat sortie, with live ordnance that needed to be downloaded before the wiring repairs could be completed. When the repairs were done, a full release-and-control check would be needed before the aircraft was safe to fly. Our maintenance officer told us that our skipper did not want us to work on Christmas day. So, we packed up our stuff, got a good ATAF on tools, and left for the rest of the day.

After breakfast the next day, we began repairs on aircraft 300. It was a total team effort for the entire rescue crew. Two of us repaired wires, connectors, and circuit-breaker panels, while the others changed both generators and the battery. After the repairs were completed, we applied power and turned on all electrical systems for an operational check. Since everything checked 5.0, we asked our MO to do a ground-maintenance turn. Next, we completed a full release-and-control check on each weapons station. Our MO flew the jet over the airfield on a check flight, and all systems worked as advertised.

The ship's port visit was over, and the aircraft flew back safely to the ship. After the jet landed on the carrier, a closer inspection revealed that the shielding had taken most of the heat; the wires showed little evidence of an electrical fire. We believe the cause of the short was phase input into the No. 2 circuit-breaker panel: A possible breakdown in the connector-pin separator, from age or fatigue stress, caused the wires to short together and resulted in a fire.

Maintainers worked many hours to make sure the pilot and aircraft safely returned to the carrier. The electrical-protection system of the FA-18C Hornet worked as it should, only supplying power for the right generator to the essential bus. Had it not been for that system, good maintainers, and a good pilot, the story could have ended much differently.

Petty Officers Surina and Ross work in the AE shop at VFA-37.

Tool Control
Don't Keep a Secret

By AMEAN Christopher Boyle

After reading a recent *Mech* article that explained how the maintenance officer at the Naval Safety Center once recalled his skipper from a flight because of a lost tool, it made me realize that I had a lesson to share to reenforce the importance of tool-control procedures.

It was just like another busy maintenance day at VR-48, based at NAF Washington, D.C. Our C-20G aircraft was scheduled to be towed from the hangar to the flight line for engine turns. We had completed an engine change on the last day of a major-maintenance evolution, something that doesn't happen very often. Engine changes can take up to four weeks if you run into problems. However, this one went smoothly and we finished in only two weeks.

My cranial was attached to my coveralls while I waited in the hangar for the aircraft to be moved to the flight line for turns. With the aircraft move completed, I needed to go inside and return my gear. When I signed the cranial back in, I noticed a snap was missing, and I was not sure what to do. I was afraid to tell anyone about the missing snap because the engines had started to turn outside. I did not want to be the one who stopped the engine turn, so, I decided to wait before telling anyone.

After five hours had passed, I submitted a broken/missing tool report (BTR) for my cranial. The engines had been turned up several times, and they continued to turn for a long time. Since my supervisor was out on the turn, I went to quality assurance with the BTR.

As I explained the circumstances to the QAR, I realized the huge mistake I had made in waiting to report the lost snap. Immediately, the QAR directed the turn crew to shut down the engines. I was informed I should not have waited as long as I did to notify someone of the missing snap. While I went to retrieve the work-center tool log, the maintenance department began a combat-FOD walkdown to locate the missing piece from the cranial. By the time I returned, the missing snap had been found on the flight line.

I learned that FOD is a very serious issue in the aviation community, and it is everyone's job to watch out for it, regardless of rank. I realize I could have caused a mishap or engine damage. Fortunately, that didn't happen. When someone sees or realizes that something is missing, they immediately should tell a supervisor, so a search can be conducted at once.

The 4790 explains the tool-control program and the procedures for missing or broken tools. Missing tools can cause an aircraft to crash. Don't be the one responsible for an aircraft crash caused by poor tool-control procedures!

My command's safety department always stresses that anyone in the command, E-1 through O-5, can stop an evolution when a safety concern exists. I now know and teach my trainees that "everyone is a safety officer" and never to keep a secret in naval aviation.

Airman Boyle works in the airframes shop at VR-48.

Maintainers *in the* Trenches

AE3 Stephen Bell, assigned to the "Kestrels" of VFA-137, performs maintenance on the engine bay of an FA-18E Super Hornet aboard the *Nimitz*-class aircraft carrier USS *Abraham Lincoln* (CVN-72). Navy photo by MC3 Rialyn Rodrigo

ADAN Zechariah Edwards and AD3 Daniel Childress perform maintenance on the engine of a P-3C Orion aircraft. Navy photo by MCSN Meagan Klein

Gunnery Sgt. Pablo Dominguez, left, and Cpl. Zach Versteegh, both assigned to HMM-265, perform maintenance checks on a CH-46 Sea Knight helicopter in the hangar bay of the forward-deployed amphibious assault ship USS *Essex* (LHD-2). Navy photo by MC3 Gabriel Weber

Aviation ordnancemen assigned to VFA-195 attach a missile to the wing of an FA-18C Hornet strike fighter before cyclic flight operations aboard the aircraft carrier USS *Kitty Hawk* (CV-63). Navy photo by MC2 Carlos Gomez

NAVAIR
Aircraft Launch and Recovery

By Joann MacRae

Intro-"Holdback Fitting Failure" by Lt. Adam J. Smith, an FA-18 pilot with VFA-83, was taken from the Naval Safety Center website and truly demonstrates why Flight Safe was developed.

I walked to the FA-18 Hornet and conducted my regular preflight inspection. The startup and subsequent taxi to the catapult were routine. What happened next was anything but ordinary.

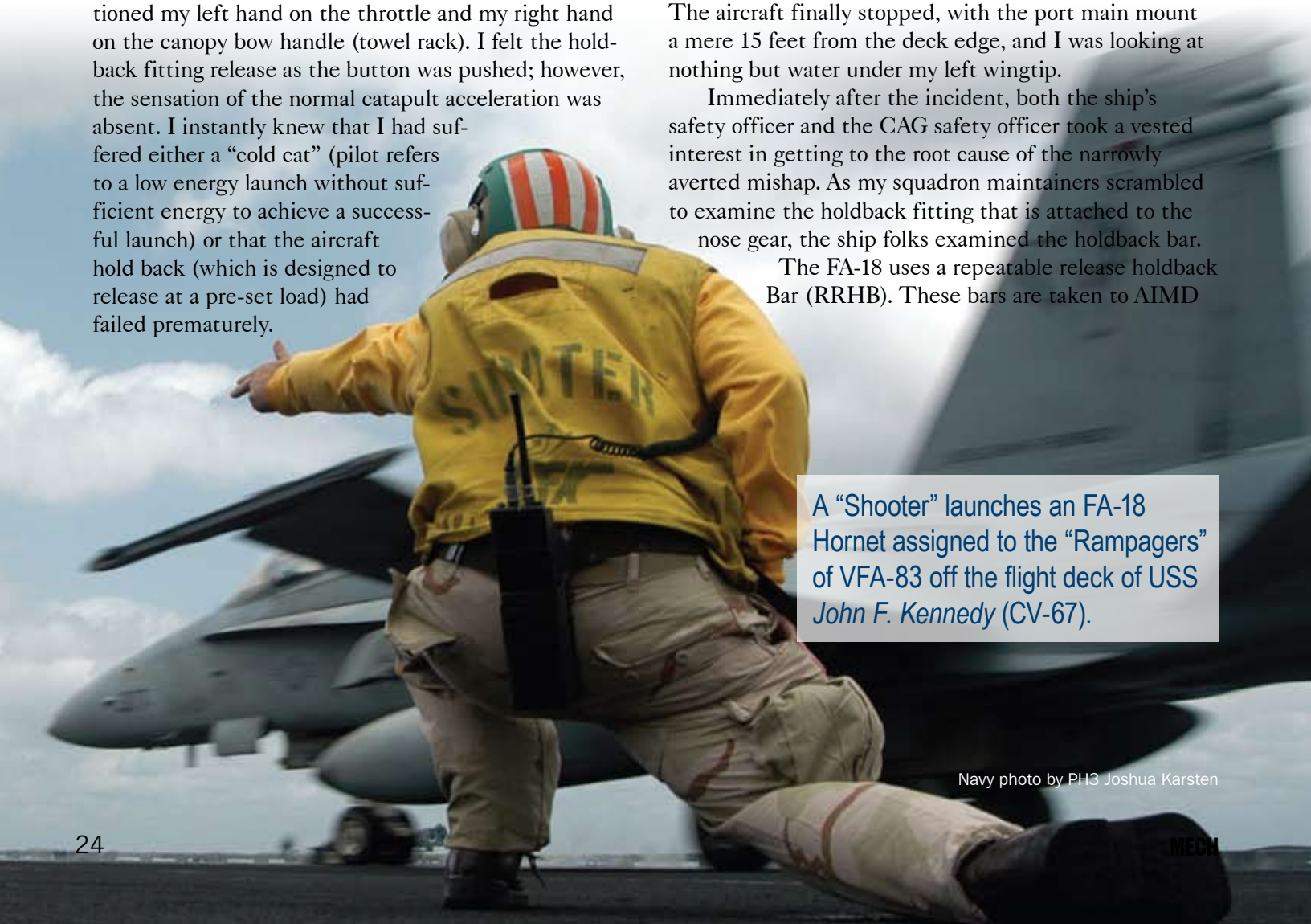
After the aircraft entered the catapult track, the holdback fitting was attached, and I was armed up by the ordnance men. The taxi director stood on my right side between the tower and the cat as he gave me the "take tension" sign. With all of the take-off checks completed, I saluted the catapult officer.

As the Catapult Officer returned my salute, I positioned my left hand on the throttle and my right hand on the canopy bow handle (towel rack). I felt the holdback fitting release as the button was pushed; however, the sensation of the normal catapult acceleration was absent. I instantly knew that I had suffered either a "cold cat" (pilot refers to a low energy launch without sufficient energy to achieve a successful launch) or that the aircraft hold back (which is designed to release at a pre-set load) had failed prematurely.

Selecting ground idle with both throttles, I threw down the arresting hook and stood on the brake pedals as if my life depended on it. My Hornet stopped accelerating down the cat track, but it was still sliding toward the forward edge of the deck. In a final attempt to stop before pulling the ejection handle, I drove down the right rudder pedal in an effort to ground loop the aircraft. The jet rotated 90 degrees to the right and continued to skid down the angle. I now was staring straight at aircraft 310 on Cat No. 2, with both main mounts stuck in the greasy cat track, offering no friction whatever. The aircraft finally stopped, with the port main mount a mere 15 feet from the deck edge, and I was looking at nothing but water under my left wingtip.

Immediately after the incident, both the ship's safety officer and the CAG safety officer took a vested interest in getting to the root cause of the narrowly averted mishap. As my squadron maintainers scrambled to examine the holdback fitting that is attached to the nose gear, the ship folks examined the holdback bar.

The FA-18 uses a repeatable release holdback Bar (RRHB). These bars are taken to AIMD



A "Shooter" launches an FA-18 Hornet assigned to the "Rampagers" of VFA-83 off the flight deck of USS *John F. Kennedy* (CV-67).

Navy photo by PH3 Joshua Karsten

and inspected after every 100 traps to verify their integrity. The preliminary investigation report pointed to a failure of the RRHB that caused it to only partly reset in the deck plate and therefore fail during my launch. Subsequent investigations by the air division showed that the ship had more RHHBs in the same unsatisfactory condition. Since the incident, all of the RHHBs have been inspected, and the failed ones have been replaced. As an additional measure, the "shooters" now incorporate a more stringent examination of the RHHB as part of their pre-launch checklist.

The above incident actually occurred on board CVN-67 in 2004. Working on catapults, arresting gear, and visual-landing aids on an aircraft-carrier flight deck is one of the most dangerous jobs in the world. The business of launching and arresting aircraft at sea requires very high system reliability: 99.9 percent. Over the years, airplanes have continued to increase in weight and speed, which increases the energy required to launch and recover airplanes. This also increases the stress, wear and tear on catapult and arresting-gear parts. These conditions have reduced the factors of safety for ALRE critical parts.

The ALRE community also faced issues that adversely affected how we bought parts. In fall 1999, defense-procurement agencies procured ALRE critical safety items improperly. Some of these parts did not meet engineering specification and had the potential to affect flight safety, including personnel safety. Parts delivered by these contracts had to be re-inspected by NAVAIR Lakehurst quality-assurance personnel. The resulting engineering investigations, which included sample inspections of each contract, revealed that components from 40 percent of the contracts did not conform to drawing specifications, and 20 percent were not approved for fleet use.

As a result, "ALRE Flight Safe," now part of the Aircraft Launch and Recovery Equipment Maintenance Program (ALREMP 4790), was established to address these issues. NAVAIR Instruction 4200D, 20 June 2002, "Management of Critical Application Items including Critical Safety Items," established policy, procedures, and assigned responsibility for the life-cycle management of replenishment items critical to naval-aviation safety. The ALRE flight-safe program is documented in NAVAIR Instruction 13800.18.

The three main elements of ALRE flight safe are: Special requirements for buying and inspecting critical safety parts, critical installation processes, and the design and development of new systems and service changes.

The first element pertains to the acquisition of ALRE safety critical parts or critical safety items (CSIs). CSIs are parts that can cause loss or serious damage to equipment, loss of aircraft, or serious injury or death to personnel when not properly manufactured. Of the 18,000 ALRE components, there are approximately 400 CSIs that have been identified and are part of the flight-safe program. The drawings used when buying all ALRE CSI parts have been revised to identify them as critical safety items, and more stringent quality-assurance requirements have been added to the inspection process. The CSI QA requirement includes a quality characteristics list (QCL) that is developed for each part.

The QCL contains all of the major and critical dimensions and material properties for each part. CSI items are shipped to Lakehurst after procurement and before they are sent to the fleet for use. Lakehurst QA inspectors scrutinize each CSI item, and each part that meets the technical specifications is certified with a material identification code (MIC). The MIC is permanently marked on each inspected item or its packaging. This process ensures the delivery of quality parts to the fleet. The revised ALREMP OPNAVINST 4790.15D instruction has added a requirement for the shipboard Sailor to record the CSI MIC numbers in their maintenance-action forms. Each time a CSI component is used during maintenance of an ALRE system, the MIC marking now is recorded in block #35 of the MAF.

The second element of the program pertains to the control of critical installation processes. A critical ALRE installation process is any ALRE equipment installation process determined by NAVAIR Lakehurst engineering to be essential for safe ALRE system performance or operation. To date, eight critical catapult and arresting gear assemblies that can cause unsafe conditions have been identified.

The third element of ALRE flight safe deals with the design and development of new ALRE systems and service-change parts. Special design and test requirements and an extensive review process have been incorporated by Lakehurst senior engineers to make sure new ALRE systems and parts are designed with safety in mind. This process is invisible to the Sailor but is emphasized here to assure shipboard personnel that the engineers at Lakehurst have their safety in mind throughout the design and development process.

The NAVAIR ALRE flight-safe program has instituted processes and procedures to foster a safety focus on our equipment throughout its life cycle, from design to retirement from operation.

Ms. MacRae is the asst. program manager for training at NAVAIR Lakehurst, Code 6.7.5.1.

Sailors and Marines Preventing Mishaps

BRAVO Zulu

Send BZs to: SAFE-Mech@navy.

BZ of the Quarter

AM3 Timothy James
HSL-42 Det. 5

While doing a late night daily and turnaround inspection on Proud Warrior 437, Petty Officer James found a broken centering socket on the black rotor blade. This find was significant because the centering socket is not seen easily nor is it part of the checklist. He quickly notified his maintenance supervisor of the problem, and the aircraft was downed. The aircraft quickly was repaired and returned to meet operational commitments.

AD2 Eric Wood
VPU-2

While inspecting a squadron aircraft for an E-handle vibration discrepancy, Petty Officer Wood noticed a crack on the firewall of engine No. 2. Further investigation revealed there were multiple cracks. He immediately notified Maintenance Control.

If the cracks had gone unnoticed, and if the aircraft landing gear had been raised, the potential would have existed for FOD and possible catastrophic damage to the landing gear. Petty Officer Wood's alertness and safety attitude prevented possible aircraft damage or worse.

AO2(AW) Andy Boyd
HSL-46

During a QA FOD check on Cutlass 472, Petty Officer Boyd found a screw lodged between the center stab and airframe fitting. The movement of this flight-control surface

had caused the screw to damage both the center stab and the fitting. Maintenance Control was notified, and the aircraft was taken off the flight schedule.

Petty Officer Boyd's meticulous inspection techniques allowed him to find a problem in an area that was very difficult to see. The piece of FOD in this critical flight-control surface could have caused control problems, possibly causing a mishap.

AM2(AW/NAC)
Timothy Lankford VR-53

As the aircrew of aircraft 164997 finished the before-start checklist, Petty Officer Lankford assumed his position in front of the aircraft for engine start. He was completing his final-visual inspection when he saw a substantial amount of fuel leaking from an area inboard of the No. 2 engine. He immediately informed the flight station of the problem and helped troubleshoot the leak. The leak was corrected, and in 30 minutes, the aircraft was ready to complete the remaining portion of the mission.

Petty Officer Lankford's actions prevented a potential mishap, which could have resulted from a wing fire. His actions aided in assuring an on-time and completed NALO mission.

AT2 Brandon Potter
VPU-2

Walking between his work center and Maintenance Control, Petty Officer Potter saw a civilian delivery truck trying to enter VPU-2's hangar. While the spaces clearly were marked with "do not enter" and "open fuel cells" warning signs, the delivery truck continued its attempts.

Petty Officer Potter immediately stopped and rerouted the delivery truck. He was pivotal in preventing a fire and injury to personnel.

AT1(AW/NAC) Angelo Bivona
VR-53

Aircraft 995 taxied for takeoff in Iwo Jima, Japan, when Petty Officer Bivona saw smoke billowing from the No. 1 engine exhaust. Displaying excellent CRM skills and situational awareness, he immediately and assertively told the aircraft commander, and the engine was shut down.

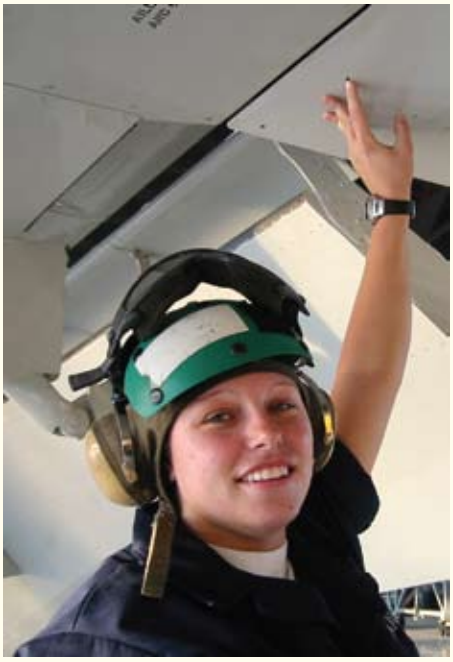
Inspection revealed the aft scavenge pump had failed and dumped excess oil into the exhaust flange. Continued operation of this engine likely would have led to an engine fire and possible injury or loss of life.

Petty Officer Bivona's calibrated awareness of his environment and congruous reaction to the situation significantly reduced the possibility of a catastrophic mishap to a benign maintenance evolution.

ABE2 Harry Webster
NAS Oceana Air Ops

During routine night operations at NAS Oceana, Petty Officer Webster reset an out-of-battery arresting gear several times. After resetting and inspecting the gear, he noticed

that an 8-by-10 foot section of the rubber-impact pad on the runway had separated completely from the attachment points. This left a large, shallow hole in the runway with exposed rebar bolts. Petty Officer Webster immediately notified the tower to wave off an FA-18 on short final. His actions prevented serious damage to the aircraft. Tower subsequently closed the runway.



AWAN Erika Leffler
VR-56

While doing a final walk-around with the aircrew on a C-9B, Airman Leffler found a screw sticking through a drain hole on the port aileron. Later investigation revealed this screw obstructed movement of the aileron and could have caused a flight-control failure.

On another pre-flight a week later, AWAN Leffler noticed that the service-door evacuation slide was installed incorrectly. Had an emergency evacuation occurred, the slide would not have deployed. In each of these cases, Airman Leffler's attention to detail prevented a mishap.

AM1 Joseph Figarelle
VAQ-133

While inspecting the port wing of an EA-6B Prowler, Petty Officer Figarelle found that the outboard slat-torque tube had been ground down, almost to the point of breaking, by a screw that was too long. This screw could have caused a catastrophic flight-control failure and possibly injured or killed the aircrew.

AM3 Eduard Fejzo
HSL-44 Det. 10

During a 7-28-day special inspection on the detachment's SH-60B, Petty Officer Fejzo found a sheared seal pressure and scavenge-tube assembly for the No. 1 engine. This gripe led to replacement of the engine. Were it not for Petty Officer Fejzo's keen eye and attention to detail, the engine could have failed in flight.

AMT2 Jason Lee
U.S. Coast Guard Air Station Miami

Petty Officer Lee deduced that a recently departed HH-65 was leaking oil. While co-workers questioned the possibility, he immediately made phone calls, and air-traffic control directed the helicopter to land.

On deck, the crew found the engine-oil reservoir below the sight gauge and oil leaking profusely from the engine. It was a great example of MRM, CRM, assertiveness, and just plain awareness. His actions directly prevented an in-flight emergency.

CROSSFEED

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Life Support Systems

Are We Doing It Right?

By AMEC(AW) Eric Wickham

Problem: Lack of publication knowledge can be inherently dangerous in our field. For example, recent surveys revealed personnel performing maintenance on NVG systems while not being medically qualified, "OXYGEN ONLY" toolboxes not being kept clean from grease and oil, and LOX coveralls and gloves torn or missing.

Solution: We must be vigilant in teaching our junior Sailors to conduct maintenance safely and properly. Make sure they read the appropriate publications.

COMNAVAIRFORINST 4790.2A, Chap 10, para. 10.4.2.6 and NA 13-1-6.4, par. 3-46 outline PPE requirements for LOX operations. COMNAVAIRFORINST 4790.2A, Chap 10, para. 10.12.5.2a. outlines the use of "OXYGEN ONLY" tools. NAVMED P-117, Chap 15-9, outlines the medical requirements for NVG maintenance and use.

Best Practices: There have been a lot of changes in how we do business, over the last couple of years, with the incorporation of new technologies. Sailors who know where to find information in the pubs have strong work centers and solid programs. Question junior personnel on their use of publications, and show them the right places to find the most current information.

It is evident this is being done in some commands, including VFA-143, VMAQ-2, and VFC-12.

Chief Wickham is a maintenance analyst at the Naval Safety Center.

Powerplants

Protect and Account for Removed Parts

By ADCS (AW/SW) Chris Smith

Problem: A majority of power plants work centers are not protecting removed components or accounting for consumables, while parts are awaiting additional maintenance.

Over the past year, I have seen various ways of storing repairables and consumables that are awaiting maintenance or other parts before being reinstalled on the aircraft. The major problem is that consumable parts are not being accounted for, and repairable parts are not being protected from damage and contamination.

Solution: COMNAVAIRFORINST 4790.2A, Chap 3, para. 3.2.3.2.2.1, states, "All aeronautical material, regardless of its status, RFI or non-RFI, shall be preserved, packaged, and handled by supply and maintenance personnel in such a manner as to prevent damage or deterioration."

If you, as the maintainer, remove a component from an aircraft that needs to be stored, ensure it is capped and plugged properly and wrapped in bubble wrap, barrier paper, etc. When storing consumables, account for each nut, bolt and washer

that goes with the component by marking the MAF bag with aircraft, nomenclature of contents, JCN/MCN, and quantity. This step will save countless hours by ensuring you have all parts accounted for. This step also reduces the possibility of contamination and accidental damage that can cause more hours of maintenance and aircraft down time.

There is no worse feeling, when trying to complete a maintenance task, than having to go back to maintenance control and let them know you need to order more parts, or that one of your components is damaged. These simple steps will increase your turnaround time and establish a more organized work center. Remember to take care, look out for each other, and always keep safety in the forefront of every maintenance evolution.

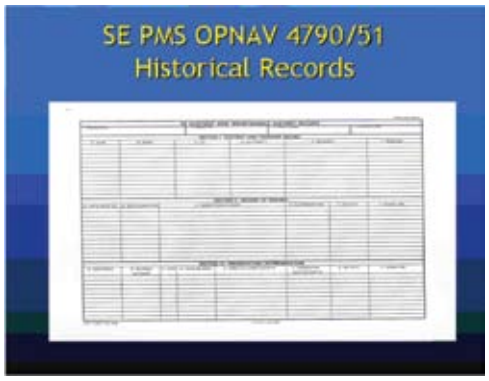
Best practice: VFA-154 has an outstanding process to ensure all material is protected properly. Although they did not create a unique process, they followed the basics written in the NAMP, and the program works extremely well.

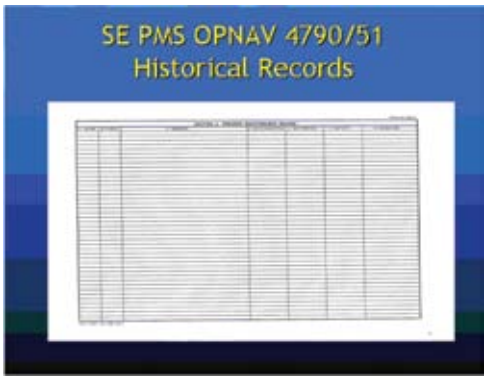
Senior Chief Smith is a maintenance analyst at the Naval Safety Center.

Support Equipment

SE Historical Record Errors

ASCS(AW/SW) Reggie Evans





Problem: Over the past two years, since being assigned to the Naval Safety Center as a support equipment analyst, I have noticed a trend, mostly among organizational-level-maintenance activities. They don't properly maintain OPNAV 4790/51 SE Custody and Maintenance History Records. Erroneous entries annotated in section V are a common error. Logging preventive maintenance in section V is only required for major inspections, such as NDI or proof-loading of slings, holdback adapters, etc. COMNAVAIRFORINST 4790.2A, SE PMS NAMSOP, addresses what should be logged on the OPNAV 4790/51 form.

Another problem is absent or overdue verification and validation of NALDA NAT 02 entries. This must be done annually to make sure technical directives are current as applicable to support equipment.

SE documentation is paramount to an effective SE PMS program in any command. It must be held to the highest standard of compliance to ensure equipment is safe and available for immediate use to support aircraft maintenance and flight operations.

Solution: COMNAVAIRFORINST 4790.2A Chap 10, para. 10.17.4.1.2. states, "When errors are made, the entries should be lined thru and properly initialed by the person correcting the discrepancy." Staying on top of support equipment changes and bulletins, along with validating NALDA NAT02, will enhance your preventive-maintenance program significantly.

Best Practices: Marine Corps squadrons in Yuma, Arizona, should be commended. The majority of the commands I surveyed were in compliance with the CNAF 4790.2 instructions and with policies established by their local wing command.

Senior Chief Evans is a maintenance analyst at the Naval Safety Center.

Electrical

ESD Safe Areas

By AEC(AW) James Esslinger

Problem: Several commands do not have an ESD safe area to dissipate static energy before handling electronic equipment.

Solution: Read the referenced material, find out the requirements, and use Public Works for installation and maintenance, including periodic checks along the same timelines as the ground points in your hangar and flight lines.

The specific requirements of a Hard Ground are referred to in the MIL-HDBK-263 as any ground that can be measured with a multi-point check at less than 20 ohms. The MIL-HDBK-263 suggests using a cold-water pipe or equivalent as a possible grounding point. If you are concerned about the legitimacy of your ground, contact a PW certified electrician to verify it.

NA 01-1A-23 also covers aspects of setup. If you think or have been told, "We don't need an ESD safe area because we don't open WRAs," then you are wrong. If you are the ESD-program manager, visit www.asemi-cap.net, get your login, and start receiving newsletters. You also can review the training aids and FAQs to help get your program up and running.

Best Practice: I have seen some commands with a safe area in the Avionics work center(s), as well as Material Control. Safe areas should be placed anywhere that electronics may be handled.

Chief Esslinger is a maintenance analyst at the Naval Safety Center.

Class C Mishap Summary

By ADCS(AW) Michael Tate

From March 14, 2008, to June 04, 2008, the Navy and Marine Corps had 22 Class C mishaps involving 22 aircraft. Crunches are still a problem.

Crunches during the quarter involved personnel running maintenance stands into aircraft, operating support equipment without valid licenses, and towing aircraft into structures.

In all of these events, I cannot pinpoint what we normally would call a common cause. Overall, these mishaps reemphasize the need to use the barriers we have to help us protect ourselves and our national assets.

Standardization, found in our NAMP and other governing instructions, provides barriers that we need. If we bypass or work around them, by not complying with licensing procedures and not following the guidelines established in maintenance manuals, we have active failures. These active failures, coupled with already present latent conditions, eventually will lead to a mishap condition known as the "Swiss Cheese" model.

We need to keep barriers in place, especially when the pressure cooker starts. In more than one of these crunches, it was inferred that operational tempo led to deviation from the basic procedures. Basic maintenance practices and adherence to standard operating procedures keep us and our equipment in safe and working order.

Senior Chief Tate is a maintenance analyst at the Naval Safety Center and coordinator of the Cross-feed section of Mech.

Helping Sailors and Marines Help Themselves

Sierra Hotel

Commander, Naval Safety Center would like to recognize the following aviation commands for their recent participation in safety surveys, culture workshops, and maintenance malpractice resource management (MRM) presentations for the months of April-May.

Safety Surveys

VFA-94	VFA-154	VMGR-252
VFA-125	VMMT-204	VMX-22
VFA-122	HMH-461	VMAQ-2
VFA-146	VMA-231	VFA-143
VFA-147	VMA-223	VFC-12

MRMs

AMO School
VFA-94
HSC-28

Culture Workshops

HMM-264	HSC-25	VR-46
MALS-14	VAW-113	VR-51
HMLA-367	VP-4	HT-28
HS-4	VP-9	VT-27
HSC-21	VR-1	

Navy photo by MC1 Michael Kennedy

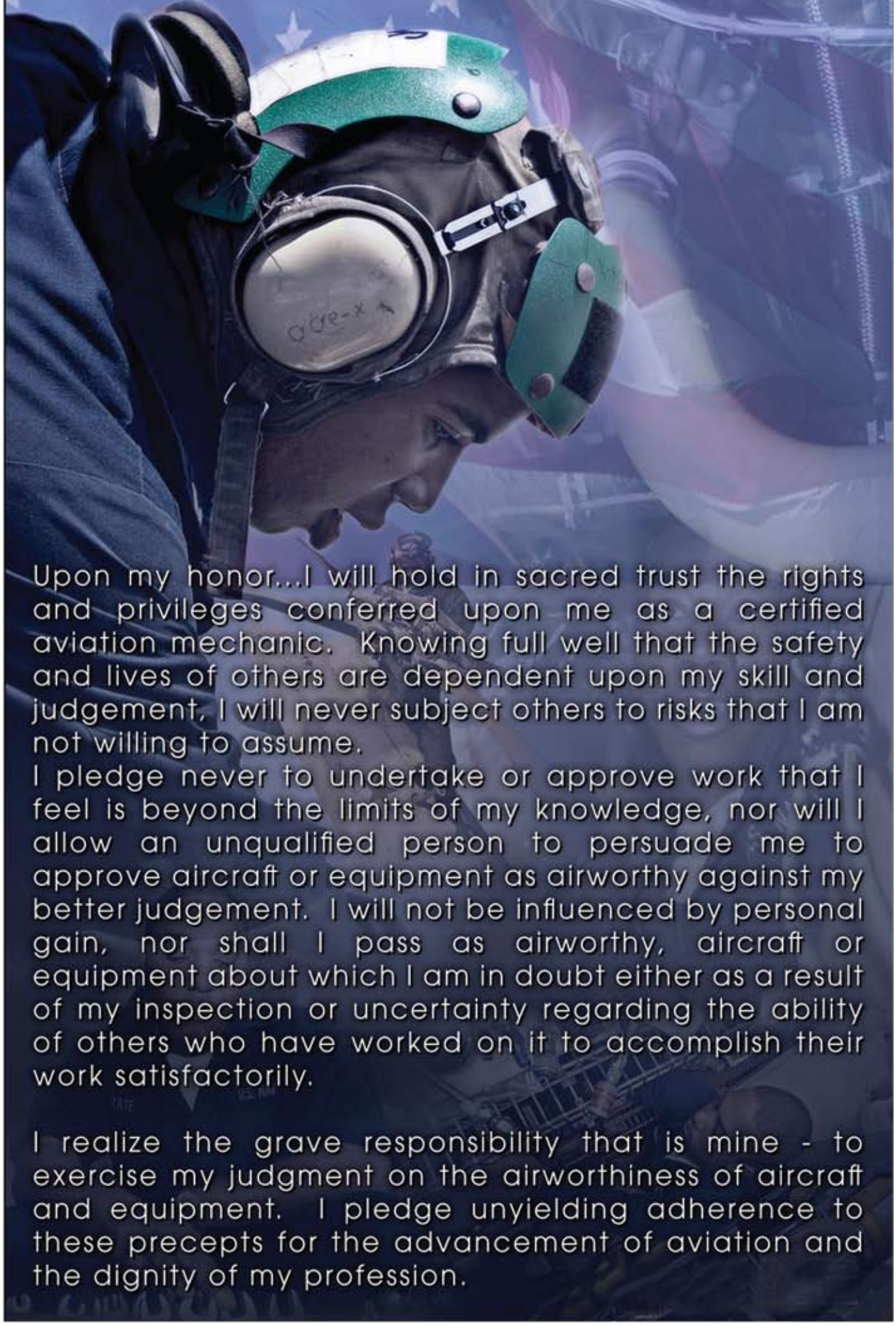
For more information or to get on the schedule, please contact: Safety Surveys: Capt. Chris Foley, USMC at 757-444-3520 Ext. 7223, MRM: AMCS(AW) Robert Chenard at 757-444-3520 Ext. 7221, Culture Workshop: Cdr. John Morrison at 757-444-3520 Ext. 7213.

When you GAMBLE with safety, remember. . .

A PAIR beats A FLUSH!

PPE IS ALWAYS A SURE BET!

Poster by AT1(AW) Adam Vonder Ahe-Cossey, VFA-151



Upon my honor...I will hold in sacred trust the rights and privileges conferred upon me as a certified aviation mechanic. Knowing full well that the safety and lives of others are dependent upon my skill and judgement, I will never subject others to risks that I am not willing to assume.

I pledge never to undertake or approve work that I feel is beyond the limits of my knowledge, nor will I allow an unqualified person to persuade me to approve aircraft or equipment as airworthy against my better judgement. I will not be influenced by personal gain, nor shall I pass as airworthy, aircraft or equipment about which I am in doubt either as a result of my inspection or uncertainty regarding the ability of others who have worked on it to accomplish their work satisfactorily.

I realize the grave responsibility that is mine - to exercise my judgment on the airworthiness of aircraft and equipment. I pledge unyielding adherence to these precepts for the advancement of aviation and the dignity of my profession.

Poster by HSC-25

www.safetycenter.navy.mil