The Navy & Marine Corps Aviation Maintenance Safety Magazine

Mech

Spring 2007

Time-Critical ORM:

Common Sense Goes a Long Way

Wing-Tip Crunch Teaches Communication Lesson

When Fingers Get in the Way

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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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Front cover: A crewmember assigned to the Helicopter Anti-Submarine Squadron Six (HS-6) inspects an SH-60F Seahawk before flight operations on the flight deck aboard the nuclear-powered aircraft carrier USS *Nimitz* (CVN-68). *Navy photo by MCSN David Smart.*

Admiral's Corner

From Commander, Naval Safety Center

Time-Critical ORM and Starting the Year Right

Success in safety involves identifying hazards, and then taking necessary steps to prevent them from becoming mishaps.

Maintainers have been doing that for years, and you've done your part this year…on and off duty. But success isn't "doing it right" for a few days, weeks or months. It's getting it right every day and every launch and every time you get in your car.

I want to take just a little time to share some facts about on- and off-the-job mishaps.

I had our people run statistics for maintenance-related mishaps for the last 10 years. I wanted to know what impact, if any, we've had with maintenance. The first part, I'm happy to say, is that maintenance-related involvement in mishaps is small. Last year was exceptional, and your efforts actually lead to a dramatic reduction in maintenance-related mishaps. However, in CY06, we still had 20 Class A, B or C mishaps involving 21 aircraft, and at a cost of $120 million.

What these numbers tell me is that we're doing good, but we can and must do even better. You can see the numbers over the past 10 years on the accompanying chart.

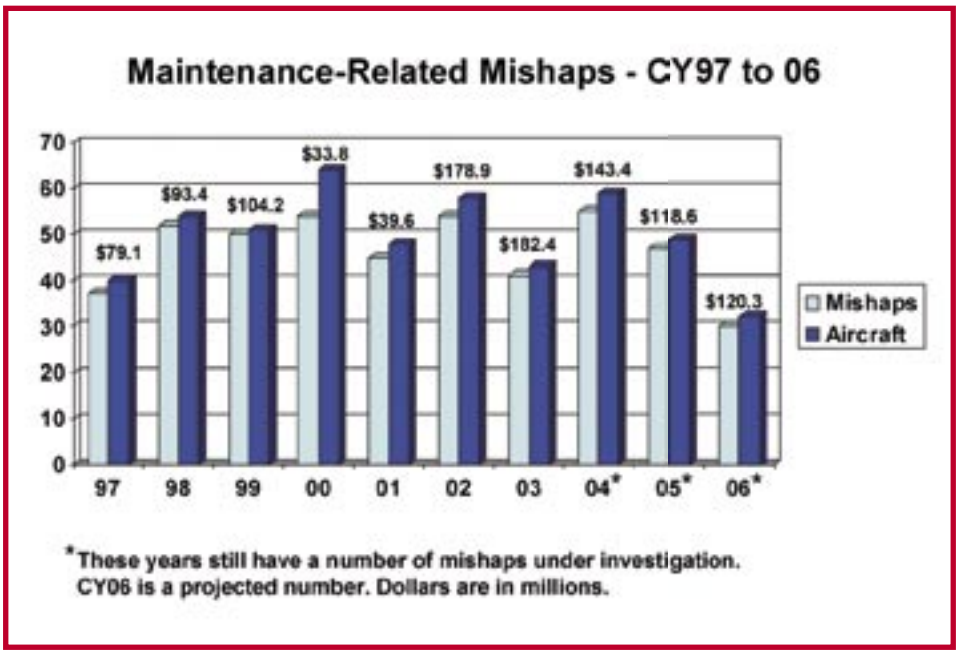
We also have good news off duty. As I write this note, we are having the best year ever for private motor vehicle mishaps. Motorcycle-related mishaps also are down—best in the past five years. I hate saying too much too soon because there's a lot of time left in the year, including the critical days of summer, but you have come through admirably to this point.

We will be successful, but only if this wonderful trend continues. So I need every maintainer to do what you've done in the past: Help to solve these issues permanently. Talk with your shipmates, make sure your people have plenty of rest, discuss ways to stay safe on and off duty, and use time-critical ORM. It takes only a second to be injured, so take a couple seconds to plan for your safety. Identify hazards and ask yourself "what can hurt me or cause damage," then take steps to reduce these risks, set controls, and keep checking yourself and your shipmates to make sure you adjust when things change or are different.

Before you start an evolution, ask yourself a simple question, "What's different today?" and use the simple A, B, C and D process described on the next page.

Your continued hard work will make this the best year ever for mishaps.

RADM George Mayer



In This Issue:

Stories on Time-Critical ORM in Maintenance

Navy photo by MC3 Dominque Lasco

By Dan Steber

The three levels of operational risk management (ORM) are in-depth, deliberate and time-critical. The first two imply a well thought-out process, where time is available for a well-defined plan. In this issue, I've shared stories that deal with time-critical ORM, which maintainers use most often.

Time-critical ORM is the type that maintainers do on the fly, sometimes without even thinking about it, but we must think about this part. It needs to be an integral part of maintenance each and every day. Time-critical ORM is used when there isn't time to plan. It's the review necessary anytime a job is attempted on short notice, or during the execution of a mission or job. It's a critical step in safe maintenance and is a fundamental action in answering the question, "What's different today?"

For example, the simple job of wiping down canopies. Start with the simple A, B, C, and D approach: You need to A=Analyze the situation. Look at the hazards surrounding the job you're about to do. Quickly look at the things that can get you hurt or killed, whether its changing weather conditions, chemicals, slip and fall hazards, or any risk that might be present.

Next, B=Balance Your Resources: Ask yourself if you have the right number of people involved. What are the time constraints? Are the people knowledgeable about the task being attempted? Do you or the team have the right equipment to get the job done?

Once this mental notation is done, the next part is C=communication. It's necessary to make sure everyone knows what is going on. Talk with other workers, the flight-deck chief, or maintenance control when the plan or conditions change. It might be necessary at times to let someone know that you cannot get the job done with the available resources. You also must communicate the need for any additional requirements, like people, equipment, PPE, tools, or other gear that might be necessary to get the job done safely.

The final part is D=Do and Debrief. Once the decision is made to go forward, you need to take the steps to get the job done, being careful to prevent anything from happening that can cause you or your team harm. Once the job is done, the task should be reviewed and debriefed for lessons learned.

Several stories in this issue show a lack of ORM. Maintainers admit their mistakes, as usual, but read these stories with a critical eye. Try to identify the steps that could have been done ahead of time or during execution to avoid the problems presented. Look for the cases where maintainers should have asked, "What's different today?"

We can't improve unless we look at lessons learned and improve on past mistakes. Repeat mishaps continue to occur. We backed or towed aircraft into objects. A tail rotor struck a tie-down strap during a maintenance turn. We dropped pods and drop-tanks. Access doors separated from aircraft, canopies were damaged, and other mishaps show that time-critical ORM is essential. Don't let the same mistakes happen to you, your shop, or your squadron. You can make a difference.

Common Sense Goes a Long Way

By ABH3 Ashley Cypret

Some people refer to operational risk management as a formal approach to common sense. Whether that statement is true is debatable, but I wish I had used either to avoid an incident on the ship.

The day started out easy for the flight-deck crew on USS *Iwo Jima* (LHD-7), just a few maintenance and training flights for the embarked Marine Air Combat Element. It was mid-afternoon when we worked to get the flight deck ready for a RAS and VERTREP scheduled for the next day.

The deck was set up for the VERTREP when the CO announced on the 1MC that we had been ordered to leave for the coast of Lebanon to evacuate American-embassy personnel and citizens. Within a few hours, we were told to respot the flight deck for an early morning launch.

On the starboard elevator, AV-8B Harrier maintainers requested a MEPP (mobile electric power plant) unit for an instrument power-check before takeoff. Our tractor king (TK) directed me to get the MEPP unit to the aircraft for some on-the-job training because I was being considered for the TK job. Even before I got on the MEPP, I reemphasized to him that I was not qualified for the MEPP unit and that I needed a phase sheet for it. The actual or acting TK told me not to worry; he said a little training would help me get a better feel for the MEPP unit. Oh man was he ever wrong!

I was relieved to learn that the MEPP unit already was located next

Driving MEPPs or towing aircraft on, off or around elevators can be tricky.

Navy photo by PH3 Angel Roman-Otero

to the Harrier, and all we had to do was to hook up the power cord. The maintainers immediately did their testing, and the jet was up and ready for the morning launch. We disconnected the power cord from the Harrier, and I got on the MEPP unit to drive it off the elevator. Unfortunately, the only way to get off of the elevator was to drive along the painted red-and-yellow-square visual-landing-aid markings around the elevator deck edge, adjacent to the coaming. A hump exists between the elevator and the flight deck, where the elevator locks fit into the flight deck, and the TK advised me to drive over the hump.

I was a little tentative and hesitated for a few seconds before moving forward. My two front tires went over the obstacle without a problem, but my back tires got stuck. I felt pressure to get the MEPP unit clear of the elevator, so I had to give it a little more gas. Because everything happened so fast after I accelerated, I'm still not sure exactly what happened. The unit jumped forward with an almost sling-shot effect, and all I could see was the tail section of the Harrier approaching rapidly. I turned the steering wheel, hoping I would miss the tail of the jet and not hit the Harrier's stabilator. I just as quickly decided my only option was to slam on the brakes and hope for the best. Fortunately, I was able to avoid a head-on collision but still scraped the stabilator. My right arm was dragged between the MEPP unit and the stabilator, requiring a trip to medical for a checkup and to make sure no carbon fibers were in my arm.

The Harrier suffered minor damage that took a couple hours to fix, and the maintainers did a quick patch job, avoiding a missed mission.

Afterward, the TK and I went into flight-deck control to tell the handler and chief exactly what happened. We were told to write a statement and to document everything that had taken place. We then were sent to GSE to talk with the AIMD officer and LCPO. They immediately advised us that our licenses would be suspended until a full investigation could be done. It took about a month before it was completed, and we were cleared to operate again.

I learned a lot that day; the most important lesson was: Common sense goes a long way. I should have done an ORM review and asked myself these basic questions. Am I qualified? Do I have a license to be on this gear? Have I taken the proper classes for this gear? Since the answer to these questions was no, I should have used common sense and not have gotten behind the wheel.

Operational risk management will help prevent mishaps, and when we're talking about multi-million dollar aircraft…no room for error exists.

Petty Officer Cypret works in the V-1 division aboard USS Iwo Jima *(LHD-7).*

The problem here is that she did identify her lack of license and qual, but the TK convinced her to do it anyway. She should have been more assertive.—RADM George Mayer

Lack of Time-Critical ORM

By PR3 (AW) Dusty Rather

One warm day in April, the Sailors of VAQ-139 were tasked with the arduous job of replacing the starboard engine on one of two aircraft on det at a forward air base in Iraq. We had been operating as a split squadron between this base and our carrier in the northern Arabian Gulf, so those of us in the desert sometimes had to make-do with the people available. This engine swap was no exception; although, we would come to wish it had been.

Making this job an "all hands" effort, we soon installed the new engine and had the jet ready to fly. On the final phase of the swap, and when the defective engine was to be placed into a transport container and sent to AIMD, we had a serious lack of communication. That problem could have brought on disastrous results.

The four other shipmates and I weren't faced with equipment failure or any kind of weather interference; rather, it was a common item involved in most naval

aviation mishaps: human error. We had not discussed thoroughly the steps in the process for removing the main-engine sling once the engine was in the crate. With only one AD on the scene, most everyone involved had little to no experience or even a basic understanding of what needed to happen with this engine and when. However, with the AD's guidance, we mounted the engine in its container and unbolted the hoist sling from the engine.

The mech in charge of this process told me the sling was light, and we should be able to pull it off. His plan was to lift one end of the engine sling just enough to let us slide it clear. He positioned himself and prepared to lift one end of the sling.

About that same time, I noticed one of the other guys was reaching between the sling and the engine to retrieve a dropped bolt. Not seeing this action but ready to remove the sling nevertheless, the AD yelled, "Ready?" Before I

could tell him to wait for the other guy, he lifted his end of the sling up. Realizing the weight was too much for him, though, he immediately dropped it back down. Our shipmate who had been reaching for the bolt quickly pulled back his hand and saved it from being crushed.

A few excited words were exchanged, and tempers flared. The discussion was short-lived, and we quickly determined that we needed to communicate more effectively the next time, or the next person's reflexes might not be as good.

Although we had dodged a serious injury, the point of this story is that Sailors need to learn from near-misses, as well as real mishaps. We also learned that we must use ORM while going through every maintenance task beforehand. Determine the correct procedures, and make sure everyone understands their roles. It also is critical to communicate and make sure the work area is clear of hazards. We then need to adjust the plan as things change (what's different today). What obstacles exist, and how we can avoid them to reduce risk.

Communication can be the strength or the death of any crew or squadron. Had we used the five steps of ORM (identify hazards, assess risk, make risk decisions, implement controls, and supervise), this task never would have reached the point where a Sailor was in jeopardy.

Petty Officer Rather works in the PR shop at VAQ-139.

Good example of what should have been a five-step ORM review becoming time-critical.—Ed.

Wing-Tip Crunch Teaches Communication Lesson

Navy photo by MC3 Ron Reeves

By AD1 Zamir Alvarez and AM1 Philip Carter

It was just another hot September day in the Northern Arabian Sea. The sun was rising around 0330 and setting at 1530. We were five months into a seven-month deployment. Two squadrons were deployed ashore, so the USS *Enterprise* (CVN-65) flight deck was unusually spacious. To our chagrin, it wasn't big enough.

We manned up the E-2C Hawkeye, call sign Screwtop 601, for the last day launch as the ship steamed into the setting sun. We had engines on line, were ready to taxi, and had time to spare for the scheduled launch. As 601 taxied to cat No. 1, I noticed a P-25 firefighting vehicle was parked inside the foul line on the port side of our catapult. This position wouldn't be a problem if the bird ready to launch was a Hornet or other small aircraft. I ran up to the driver of the P-25 to let him know they needed to move because our E-2C wings didn't have enough room to spread with the fire truck parked there.

We already had learned this lesson the hard way earlier in the cruise; however, parking on the port side of the catapult inside the foul line was a common practice. When we crunched a wing against the P-25 earlier on cruise, the handler directed the drivers to park outboard of the foul line on the starboard side. On this day, the P-25 driver didn't heed the handler's instruction.

After explaining to the driver that we needed more room for our wingspread, he started to move. Simultaneously, the yellowshirt directing our aircraft gave the signal to the pilot to spread the wings. As the wings were moving, I noticed that the driver of the P-25 had moved the fire truck just a few feet. Seeing this problem, I ran to the driver and told him he needed to move or the wing would hit the truck. He moved again but slowly because the jet blast deflector operators were in his way. I immediately gave the stop signal to the yellow shirt. As I did so, the flight-deck coordinator and QAR

noticed the same problem, and they also signaled the aircraft director to stop.

This is where our communication failed. After seeing my signal, the yellowshirt relayed the same signal to the pilots in 601. The pilots saw that signal and, unaware that there was a dangerous situation developing near their left wing, they thought the signal was intended to stop the aircraft, instead of the wing-spread. The pilots continued to hold the brakes, but they did not reverse the wings.

Unbeknownst to the pilots, the port wing clipped the P-25 and lifted the fire truck off the deck a few inches, destroying the outer wingtip. Needless to say, this problem downed the aircraft resulting in a failed launch.

A process that had been carried out multiple times, day and night, for the past five months, went totally wrong. It should have been easier, because the deck was less crowded, and we were in no rush. There were several hazards we faced that day, and if we had eliminated any one of them we could have prevented this crunch. The P-25 should not have been parked inside the foul line against the handler's direction. The driver should have moved immediately when the problem was pointed out to him, and the other flight-deck personnel exacerbated the problem by standing in the path of the emergency vehicle. I should have given the wing-fold signal instead of the stop signal to remove any ambiguity. I should have given the appropriate signal the instant I realized that there might be a problem.

Complacency, error in executing proper flight-deck procedures, and a break down in communication resulted in the damage of an aircraft. Fortunately no one was hurt, but simple communication between airwing personnel and carrier flight-deck personnel could have prevented this crunch from ever happening.

Petty Officers Alvarez and Carter are assigned to the Screwtops of VAW-123.

When Fingers Get in the Way

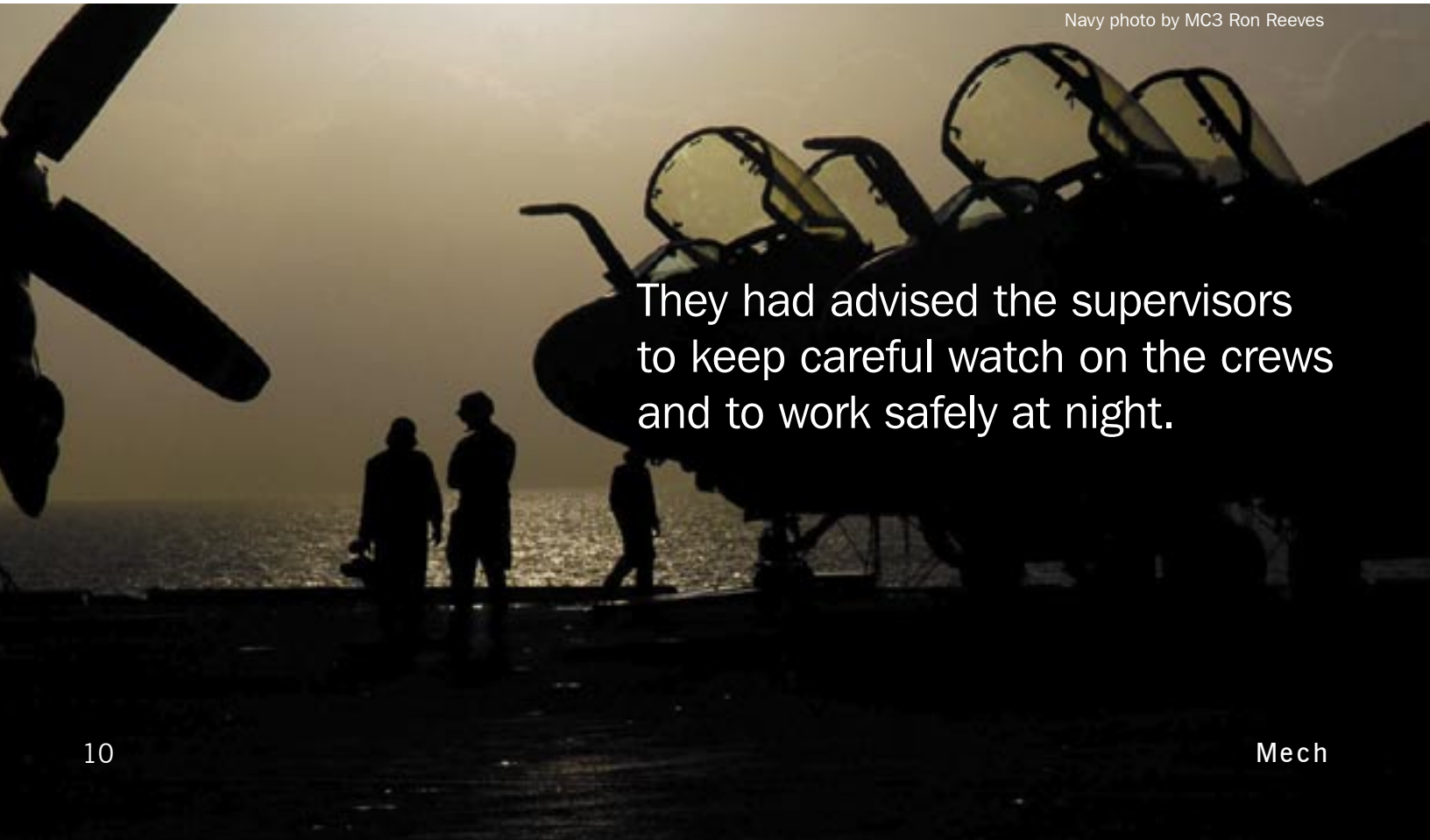
By AT2 Jacob Kauffman

On a normal day during the strike group's tailored ships training availability on board USS *John C. Stennis* (CVN-74), I made a mistake that landed me 14 days of convalescent leave and almost cost me a finger and part of my hand.

Our night-check schedule was the same, day in and day out. We'd sleep all day and work hard all night to get the major maintenance done to prepare the aircraft for the next day's flights. One day before my incident, the ship was completing its final general-quarters (GQ) evaluation for TSTA. Since our berthing was near a damage-control station, GQ meant all of the airwing night shift participated from 1200 to 1900—right in the middle of our normal sleep period. Night shift worked from 1800 to 0730, so everyone had received only about four to five total hours of unbroken sleep in a 36-hour period. We certainly were tired and maintenance control was aware of the situation. They had advised the supervisors to keep a careful watch on the crews and to work safely that night.

As the night-check supervisor of the avionics shop, I was the person who had to watch and make sure everyone was working safely, yet still try to finish our workload for the evening. Early in the morning, towards the end of the shift, the final task was to replace a trailing wire antenna (TWA). To complete it, we had to remove the cover that holds a spool of antenna wire, and swap out the five-pound drogue that attaches to the end of the wire. After the assembly was replaced, I sent the two PO3's working with me to eat. Upon their return I was going to show them how to properly install the drogue.

When they returned from chow, a PO2 joined them who also never had performed this task before. We grabbed our tools and headed to the flight deck. Unfor-



Navy photo by MC3 Ron Reeves

They had advised the supervisors to keep careful watch on the crews and to work safely at night.

tunately, we forgot to grab the pub. On the way to the flight deck, one tech told me he had done the job before but had had trouble with some of the steps. I knew extra time would be required for OJT.

I started the job as I had many times before: The wire was pulled through the end of the aircraft, and I inspected the end of the wire that was sticking out. The wire had a kink and a spot where it looked worn. When a wire is damaged, all that has to be done is reel out more wire and cut off the damaged section. While the inexperienced techs were watching, I told one of the PO3s to turn on the HF1 TWA set inside the aircraft.

What we had forgotten in our tired state was to adhere to a bold warning in the procedure that requires the hydraulic-isolation valve circuit breaker to be pulled. I had done this procedure many times and thought I had set myself up for success.

The circuit breaker needs to be pulled in order for the aircraft to think it is airborne. The trailing-wire antenna works normally, only if the aircraft is weight-off-wheels. If the circuit breaker is not pulled, the normal operation of the TWA is to immediately reel in because the aircraft is not airborne.

As soon as the system was turned on it worked as advertised. The aircraft sensed the landing gear was down in preparation for landing, and the antenna began to reel in. Unfortunately, it did so, with my hand inside the coil of wire. As the wire pulled in, the coil wrapped more tightly around my hand, pulling the wire and my hand into the end of the drogue receptacle. My hand firmly was stuck inside the coil as the wire continued tightening. I was stuck and couldn't do anything.

A quick-thinking PO2 decided to take action. He grabbed the dykes out of the tool pouch and cut the wire wrapped around my hand. As he cut the wire, we could see blood running out of my hand. Another tech called away a medical emergency. The tech who had turned the system on came out to see what had caused all the commotion. I told him to run back into the plane and immediately shut off the system.

With the wire retracted and power shut off, little slack existed inside the spool that could be pulled out. The techs struggled a little more and finally were able to cut my hand free with the little slack available. They ran me down four decks to ship's medical, with a brief stop to grab a cloth to control the bleeding.

Once at medical, the staff asked me if I was the medical emergency that was called on the flight deck! The ship's corpsman went to work inspecting the wound only to verify I had separated the tendon and nerves in my right pinky finger. The severity of my wound and the separated tendon was beyond the ship's capability. I needed to be flown to Balboa Naval Hospital for surgery. Within an hour of the incident, I was San Diego-bound.

At Balboa, the resulting surgery to fix my finger and reattach the tendons and nerves took seven hours. That step was the easy part. The consequences of my accident were two weeks convalescent leave and up to three months of physical therapy. Thanks to my peers and the medical staff, I have almost regained complete use of my hand.

The lesson learned is to slow down and use the pubs. Even when the task has been done many times before, time still should be taken to read the pubs slowly, so no step gets missed. I learned the real meaning that day about "written in blood."

Extra time also should be taken when fatigue is a factor, because even the most routine task is far more dangerous when your head is not in the game.

Petty Officer Kauffman works in the AT shop at VAW-112.

Maintainers in the Trenches

Braving wind and rain, aviation ordnancemen assigned to Strike Fighter Squadron Two Five (VFA-25) huddle around a bomb rack trying to finish their checks before the rain becomes an impediment to safety. Navy photo by MC2 Christopher Blachly.

A troubleshooter assigned to the "Stingers" of Strike Fighter Squadron One One Three (VFA-113) assists in pushing back an FA-18C Hornet on the flight deck aboard USS *Ronald Reagan* (CVN-76). Navy photo by MCSN Joshua Scott.

Marines assigned to Marine Attack Squadron Three One One (VMA-311) load a GBU-38 Joint Attack Direct Munition onto the wing of a AV-8B Harrier during a synchronization test. Navy photo by MC3 Marvin Thompson Jr.

Aircraft directors listen to the flight plan for the day (a good ORM step) and go over all safety precautions during the U.S. and Japanese Maritime Self-Defense Force (JMSDF) exercise ANNUALEX aboard USS *Kitty Hawk* (CV-63). Navy photo by MCSN Matthew Patton.

Good

Protective covers and padding help to prevent injuries.

Bad

Modifying equipment, like the removal of required doors on this tractor, is not authorized without prior approval.

Ugly

This isn't the way to handle fuel hoses.

My Kingdom for an Assist MAF

Navy photo by AN Maebel Tinoko

By AME2(AW) Scott Cutler

Two weeks into our first underway period of the year, things were going well for our AME shop. I only wish that we had paid more attention to all the things that could have gone wrong on a simple seat removal for inspection.

After the morning maintenance meeting, I was tasked to be the collateral duty QAR (CDQAR) and to oversee the removal of an FA-18F Super Hornet's two ejection seats for 728-day inspections. Maintenance action forms (MAFs) were placed in work, and checkout procedure for the tools, individual material readiness list (IMRL), and maintenance requirement card (MRC) deck was followed before we went to the work.

Our team of three arrived at the jet in the hangar bay, and the other two AMEs began to set up the area around the aircraft while I climbed on top of the aircraft to get in the cockpit.

One of the steps to remove the aft ejection seat requires access to the upper catapult-mounting bolt. While the seat removal can be accomplished without first removing the starboard cockpit-video-recording-system (CVRS) box, it is easier and often less painful (literally) to remove it. The potential for pain exists as a maintainer holds the socket wrench on the upper catapult-mounting bolt. It sometimes slips off the bolt head and subsequently slams the maintainer's hand into the starboard CVRS. In order to prevent injury to my hand, I decided to remove the recorder and place it aft of the canopy actuator, and on top of the number one fuel cell access panel located behind the aft cockpit seat.

Two days before this maintenance evolution, our LPO told us after the morning maintenance meeting that we (as a shop) were not to touch any aircraft components that did not belong to us. The CVRS box belongs to the AT shop. Before beginning the seat removal, I thought to myself, "This job is so easy. What harm could it do to remove the CVRS box myself?" I rationalized this problem and reassured myself that I could remove it in far less time than it would take to call the AT shop for help. Little did I know I would soon learn the hard way what harm would occur.

After removing both ejection seats and placing them in the seat cage, I inventoried the IMRL no longer needed for the job and returned it to the shop. Before walking away from the aircraft, I told one of the other AMEs, a collateral duty inspector (CDI), to sweep the cockpit area for tools and hardware. I arrived in the shop, put the IMRL away, grabbed some water and sat down for a few minutes. Just as I was getting comfortable the AME CDI whom I had asked to sweep the cockpit

The canopy rail and areas around the canopy need to be free of objects. This damage shows why.

walked into my shop and relayed the sentence every maintainer fears, "We've got a problem." After wracking my brain to think about what could possibly be wrong, and since we had already taken the seats out of the jet and carefully placed them in the seat cage, I asked, "What is it?"

The CDI replied, "You know that starboard recorder box?" Instantly, I felt like someone had punched me in the stomach, because I knew exactly what had happened.

I rushed to the hangar bay, climbed on top of the aircraft and looked at the spot where I had placed the recorder. The No. 1 fuel-cell access panel had a gash in it the same length of the CVRS box, and the support rib running across it was bent out of shape. The CDI had overlooked the recorder I placed on the access panel behind the aft seat and had closed the canopy on it. When the canopy was closed, it pinched the CVRS box between the canopy glass and the No. 1 fuel-cell access panel.

Through this mishap I learned some valuable lessons that hopefully will prevent recurrence of this or similar incidents. First, if an aircraft component does not belong to your work center, **do not touch it**—no matter how small the job seems. I should have cut an assist MAF and had the appropriate work center remove its piece of gear. Effective communication is key, and I should have told the other AMEs about the recorder. Had I told them, someone might have reminded me to reinstall it after the seat removal was done.

We can't afford to lose focus or attention to detail in this high-risk business. AMEs always preach to other squadron personnel to thoroughly check the canopy area before closing it to make sure nothing is in its path. On this day, my lapse of judgment allowed a fellow AME to close the canopy on an object that I had placed in the canopy's path. As the CDQAR, I should have known that doing maintenance by the book meant not skipping any steps and seeking assistance from other work centers, when needed.

Because of my seemingly minor decision to remove the CVRS box, it cost the Navy $2,000 to replace a fuel-cell panel. In addition to the large expense, this incident had a deeper cost to our squadron, my shop, and me. Our professional pride was hurt, and you can't put a price tag on that.

Petty Officer Cutler works in the AME shop at VFA-102.

PMA202: Aircrew Systems for Today, Tomorrow and the Future

By Jack Stewart and Dan Steber

The business card for Capt. CJ Jaynes, PMA202 program manager, says, "Service to the Fleet," and a visit with her team revealed it's more than just a motto.

This NavAir program office provides the Navy and Marine Corps with cost-wise and safe aircrew systems. They make sure personal equipment does what it's supposed to do when aviators or maintainers need it—lives depend on it.

Capt. Jaynes sums up her department's work with a simple statement: "If you're going to change anything on the human, see 202 first."

A big challenge for her team is their work on a wide variety of programs, including aircraft systems and aircrew, survival electronics, chemical-biological defense, and fleet-support systems.

Continually improving aviation gear, PMA202 focuses on getting users what they need. They not only rely on feedback reports but also visit with and talk to the fleet to ensure the right products are developed. This firsthand look, or "boots on the ground" effort, allows for valuable dialog and a better understanding of the fleet's needs.

Cdr. Tom Wheaton, who works the class desk, explained, "Warfighters look for tools to get the job done, and they want them now. But now is difficult to do. Developing, acquiring, fielding, and supporting take time. Quality takes time, and the gear needs to work the first time, every time."

Here's an overview of several programs and projects that PMA202 currently is working on:

Aircraft-mounted systems: Tracking aircraft-mishap trends, using reported incidents and information from the Naval Safety Center, is the foundation for many of our projects, according to Gary King of the aircraft mounted-systems team. This mishap data inspired development of the mobile aircrew restraint system (MARS), which protects crew members in the cabin during a hard landing or mishap. The system uses a modified inertial reel originally developed for crashworthy seats and integrated to the airframe and aircrew vest.

Another mishap trend indicated the need for a new crash-protection system, the common crash-resistant troop-seat system (CCRTSS), which PMA202 qualified in 2004. It is the best crash-attenuating passenger seat in the Navy today and is being fielded in all new production UH-1Y aircraft.

The premier ejection seat in use today is the Navy aircrew common ejection seat (NACES). To meet the needs of a new mission, the NACES modular design can be upgraded without a total redesign to the seat. This capability supports a wider aircrew population, including female pilots, and ensures safe ejection for both the smaller and larger aircrew. Phase II of its development included a new digital sequencer that controls critical seat functions to improve seat performance and

reduce seat cost. Phase III is planned for 2009 and will improve high-speed ejection-seat performance through the NACES stability improvement program (SIP). This is done with a new drogue stabilization system. NACES upgrades will replace older escape systems in various USMC FA-18s.

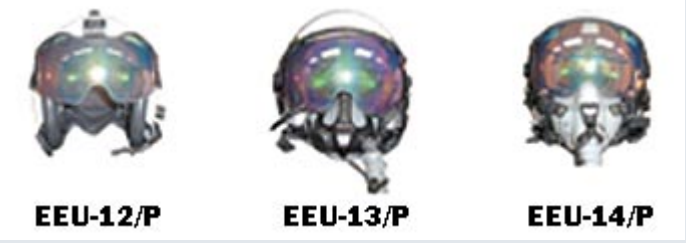
PMA202 is developing an alternative oxygen solution for the E-2D, Advanced Hawkeye, with installation of an onboard oxygen-generating system (OBOGS), instead of LOX bottles. The transition to OBOGS across all naval aircraft eventually will eliminate LOX infrastructure and reduce costs.

"People often can't appreciate the work it takes to get a product properly integrated to the aircraft and out the door," King said; for example, seat cushions that meet the requirements for extended missions.

King pointed out a Hornet mishap where an unauthorized cushion had been installed. He added, "You can't simply install a cushion in the seat. As a sub-component of an ejection seat, these seats are complex systems that are sensitive to weight, center of gravity, or structural changes. The same analysis is being done to safely integrate the joint helmet-mounted cueing system (JHMCS) with current ejection seats.

POC: Gary King, 301-757-6985

Aircrew-mounted systems: An ongoing in-service program improves gear that aviators and maintainers currently use. "Fleet support teams," according to Dex Hansard, "work with the fleet users to identify deficiencies." With this information, the teams obtain funding and get the fixes in place.



All future aviators will fight with the next generation of helmet, the joint helmet-mounted cueing system, which interfaces with the aircraft's computers, weapons, and sensor hardware. It currently is flying in the Hornet. JHMCS boasts a man-mounted, ejection-compatible, helmet-display system that optically projects aircraft, weapons and target information on the helmet visor.

The flight-deck cranial and flight helmet are being redesigned. "If you include the other services," Hansard says, "27 different configurations of flight helmets are in use, with three display modules. The intent is to develop a common helmet and cranial, with two variations: one for rotary aircraft and one for fixed wing." Night-vision devices (NVDs) and noise-protection requirements are being integrated into the flight-deck cranial. The next generation of NVDs in development significantly will improve night visual acuity and the field of view. The JHMCS night-vision cueing and display (NVCD) will integrate image-intensifier capabilities into the existing day-capable system for night operations.

The proliferation of battlefield lasers requires protection against hostile wavelengths. Improved laser spectacles and the joint aircrew laser eye-protection visor (JALEPV) will provide day and limited night protection for tactical and rotary aircrew.

A specific PMA202 success story is the multi-climate protection (MCP) system. MCP is a multi-layered clothing ensemble made with state-of-the-art fabrics that insulate without being bulky or heavy. The program office expedited cold-weather ensembles for Marines in Afghanistan.

POC: Dex Hansard, 301-757-6972

Survival electronics and equipment: The PRC-149A and the URT-140 radio beacon replace legacy radios not compatible with the SARSAT system. New radios offer enhanced search-and-rescue (SAR) location and will operate on all three internationally recognized SAR frequencies.

PMA202 is developing a helicopter egress system for passengers (HESP). This system integrates inflatable flotation with an underwater breathing air bottle to make it easier for troops to escape from a sinking aircraft. HESP is being developed in cooperation with the Marine Corps Combat Development Command (MCCDC).

Ricardo Springs, program manager, also pointed out the state-of-the-art survival item (SOASI) program, which "fast tracks" the process to qualify items for use. SOASI items are usually commercial items currently available to recreational outdoorsmen, such as flashlights, knives, signals, and some high-tech clothing.

POC: Ricardo Springs, 301-757-6955

Chemical-biological defense: This division works very closely with joint programs, which are important because the Navy has many unique requirements that must be factored into DoD programs. This division provides and services three types of equipment: individual protection, detection and decontamination.

Current programs include the joint protective aircrew ensemble (JPACE); joint-service aircrew mask (JSAM), which protects aircrew; joint chemical-warfare

agent detection, for point detecting and identifying chemical agents; joint-service personnel/skin decontamination system(JSPDS); and joint material decontamination system (JMDS) to clean contaminated personnel and equipment. Future programs include standoff detection systems, which will detect and identify nerve, blister, and blood-agent vapors at significant distances.

"We hope the gear won't have to be used," said team member David Coughlin, "but we have to be ready to use it when needed." He pointed out that 21st century realities really bring the threat to focus.

The seriousness of CBR gear led to issuing a NATOPS for chem-bio. Team member Sam Frazier said of the manual, "It's available on our website and covers individuals, aircraft and organizations."

GySgt. Forrest Sibley, fleet liaison, pointed out a specific area where maintainers can help themselves. "Check the gear and size new arrivals ahead of time to build a database so equipment is ready to go." He added that this equipment could be tracked with SEATS.

POC: Joe Marquis, Sam Frazier, David Coughlin, and GySgt. Forest Sibley, (301) 757-6969

Fleet support: NavAir's fleet-support team works with maintainers and aircrew. Six teams provide engineering and logistics support for new and modified equipment, and help investigate mishaps.

Cdr. Joe Essex says his team is ready to "respond to problems with any system, provide training, and find a fix for any deficiency." These people are the link between their developmental team and the fleet as NavAir products hit the fleet. Cdr. Essex adds, "We want to visit every squadron, every base, every year." Their role is to take care of the fleet user, or as he says, "Adapting gear to the mission to meet changing mission." The six fleet-support teams are:

- Aviation life-support systems: survival vests, anti-exposure suits, torso harnesses, life preservers, helmets, oxygen masks, flight suits, boots, radio/beacons, and parachutes.
- Aircrew-escape systems: ejection seats, crashworthy seats, fixed aircraft seating, and ejection-seat parachutes.
- Aircrew-oxygen systems: regulators and related support equipment.
- Night-vision systems: night-vision goggles, operator and intermediate-level test sets.
- FAILSAFE: This program systematically introduces new or modified aviation life-support systems (ALSS) to fleet operators and maintainers—specifically targeting purpose, proper use, sizing, modifications, and maintenance issues.
- Mishap investigations: Examine life-support and survival gear involved in aircraft mishaps. This team assists the Naval Safety Center in determining the possible causes of a mishap and possible causes of pilot, aircrew and passenger injuries.

POC: Cdr. Joe Essex, 301-757-6976

Challenges abound in PMA202 to support the fleet. Capt. Jaynes said, "We need to be responsive and have a measured success. We measure success by cost, schedule and performance, and the ability to meet all aspects stated in the business plan."

Questions often arise about the length of delivery schedules, and what can be done to expedite a fix or implement a product for an urgent requirement. NavAir has the ability to purchase existing gear or COTS (commercial off-the-shelf) products. The acquisition process is accelerated, but, as always, the NavAir engineers examine the product and must approve it.

While it may be easy to be critical of how long it takes to provide some equipment and programs, it's important to understand that NavAir only approves gear that meet certain standards. "When changing gear or equipment, PMA202 can't respond without doing it the right way. We take a step-by-step process to make sure the solution is right, and we 'lean' the process," said Capt. Jaynes. As each program gets approved for development, milestones are set to track progress. While this entire effort may take from months to several years, the goal is to deliver a product that works when needed.

For more information about PMA202, visit their website at https://home.navair.navy.mil/pma202/.

Up Close and Personal

By AT3 Paul Golden

It was nearing the end of my shift when a call came into the avionics shop that aircraft 503 needed an IFF receiver-transmitter (R/T) on the fly. I was in the shop at the time and wanted to respond as quickly as possible. It had been a busy day, and we still were fairly early into the deployment, my first one. My thought at the time was to be as productive and expeditious as possible, so I grabbed my float coat, cranial and tools.

Navy photo by PH3 Lance Mayhew Jr.

After removing an R/T from another aircraft in the hangar, I double-timed to the flight deck. Although new to the carrier's flight deck, I was qualified to go up alone. I entered the flight deck from behind the island like I had been taught and headed directly for the aircraft. As I rounded an E-2 that was next to our bird, I saw the normal people: flight deck chief, plane captain, safety, and the troubleshooters. I looked to see where I needed to go and saw our shop's more experienced troubleshooter waiting for the part. This is where it got ugly.

Before arriving at my current squadron, I mostly had FA-18 experience, and there are two major differences in the location of the exhaust. The exhaust of the Hornet is all the way aft; the EA-6B's exhaust is roughly two-thirds of the way down the fuselage. Also, the EA-6B tailpipes focus exhaust down toward the ground, unlike the FA-18, which has tailpipes pointing exhaust directly behind the aircraft.

The key factor in my incident was that I did not take time to assess the situation. Any one with vision can see the difference in the location of the exhaust. My downfall was that I relied on prior habit patterns without taking the time to look around. The area in which the IFF R/T has to go is in the "birdcage," located between the two exhausts. There isn't too much I remember after going directly for the birdcage, except the troubleshooter pointing to the exhaust, which was no more than 3 feet to my right at head level.

From the blast of the exhaust, I was lifted off of my feet and blown aft and down. I landed on my side, still holding on to the R/T. The next thing I saw I'll never forget: my cranial with my glasses still inside it flying overboard, more than 20 feet from the deck edge. I landed with my boots up against the scupper, my hand ripped from the non-skid, and my ears on fire from being directly behind the exhaust without any hearing protection. The line shack LPO and an airman quickly grabbed and led me below decks to medical.

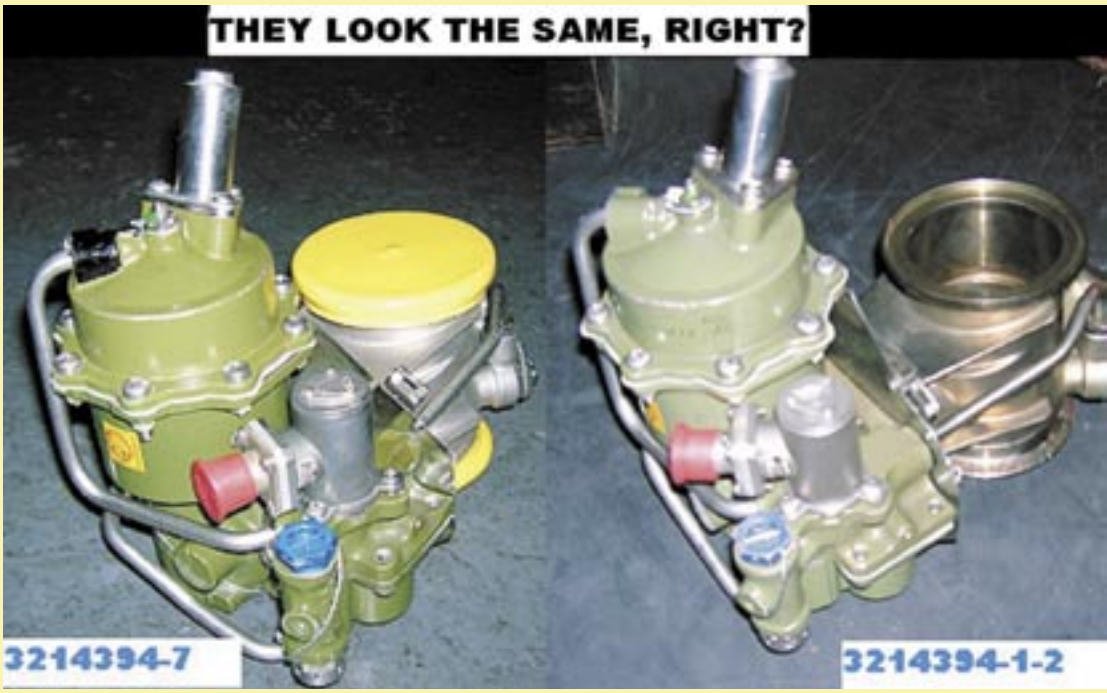
Once there, I received four stitches to my left hand and took some time to calm down. I was very lucky only to have needed stitches. It easily could have been me going overboard, along with my cranial, not to mention the possibility of losing the equipment I was carrying.

All in all, I believe my accident easily could have been avoided if I had spent more time studying my surroundings. I also should have maintained situational awareness. Just because we face an ever-present push to perform in a timely manner, it is not an excuse to develop a lax attitude. No one wants to see an accident occur because of poor decisions.

Petty Officer Golden works in the AT shop at VAQ-135.

Part Numbers Can Bite You

By AD1(AW) Kenneth Manuel



Our FA-18 squadron was deployed aboard USS *Enterprise* (CVN-65) and was flying combat missions in support of Operations Enduring and Iraqi Freedom when an article in the summer issue of *Mech* caught our attention. That story pointed out an aircraft with an MSP 833 (secondary bleed-air over-pressure) that had resulted in dual bleed-off cautions. Coincidentally, we soon found ourselves elbow-deep in a similar problem, with quite different results and lessons learned.

As Knighthawk 311 launched off the pointy end on its scheduled mission, the aircrew immediately received dual bleed-off cautions. In accordance with NATOPS procedures, the pilot checked for MSP codes 831 and 833 but found neither (MSP 831 pops for either a bleed-air leak or a bleed-air-leak-detector [BALD] failure). Since NATOPS does not cover the specific case, where neither MSP is present, the pilot discussed a course of action with the squadron representative in pri-fly. He opted to cycle the bleed-air knob, restoring ECS flow. The caution reset with no further adverse indications. Upon the aircraft's return, the AME troubleshooters debriefed the aircrew on what had occurred. Following the troubleshooting procedures in the MIMs, the AMEs started to work with the AE shop to read out the associated wiring. All wiring checked 5.0, and the secondary bleed-air-pressure switch was changed in accordance with the bleed-air-troubleshooting tree in the publications. While doing a functional check during a low-power turn, the AMEs also found the secondary bleed-air-pressure and regulating valve leaking, and replaced it, as well. All systems checked 5.0 on deck during a low-power engine run.

The next day, Knighthawk 311 was back on the schedule. An hour into the flight it once again popped dual bleed-off cautions, this time with an associated MSP code 833. The pilot cycled the bleed-air knob, clearing the caution, but it returned every time he increased power from flight idle to military. The pilot returned to the ship uneventfully and downed the aircraft for the dual bleed-off cautions.

The AEs were called to read out all the wiring again, but they couldn't find anything to isolate or duplicate the discrepancy. The process of elimination led us to try replacing the secondary bleed-air-regulator relay to fix this perplexing discrepancy. During a low-power turn the bleed-off cautions returned. The AME and AD shops put our heads together to figure out

what to do next. A little brainstorming and out-of-the-box thinking led us to believe that perhaps one of the primary bleed-air-pressure regulating and shutoff valves might have malfunctioned. Maybe the valve was not regulating bleed-air pressure correctly. This analysis led to an alarming discovery.

Any FA-18 technician knows that different lot Hornets often use different part numbers for the same or similar system. In the case of the bleed-air system, lot-13-and-above Hornets operate at different pressure than lot-12-and-below do.

Upon removing the port and starboard primary bleed-air-pressure regulators (PBARs), we discovered that the starboard PBAR had a part number of 3214394-7 and the port PBAR had a part number of 3214394-1-2. Without even realizing the error, we had reordered the same part numbers for both PBARs! The part number for the port side was correct for our lot-10 Hornets, but the starboard side was a high-lot PBAR. We didn't even know which part number was wrong until we received the new starboard PBAR and the AMEs showed us in the publication that P/N 3214394-7 was incorrect for our squadron's aircraft.

The F-18 aircraft can be very lot-sensitive on certain items, and usable-on codes must be verified when ordering parts. Somehow we had installed the wrong part during a previous maintenance action on the PBARs. We returned the incorrect PBAR, installed the correct part-number valve, did a leak check, and completed an operational check during a low-power turn. The discrepancy did not return.

Looking back on the situation, we did some research and traced the problem to maintenance completed just before cruise. Although, at first glance, the previous discrepancies seemed unrelated to the final outcome. The bottom line is the wrong part number had been ordered and installed on the aircraft, and no one had ever bothered to check the usable-on code to verify its lot compatibility. Inattention to detail cost the squadron 161.4 man-hours, and kept an otherwise full-mission-capable aircraft down for about a week.

The shop and the maintenance department learned a valuable lesson: Take time to check the usable-on codes, and teach junior Sailors how to use the pubs. Specifically, we need to show them what to look for when ordering parts. And most of all, pay attention to those small details that can prevent a major waste of time, money, and even the possibility of the loss of the aircraft or aircrew.

Petty Officer Manuel works in the power plants shop at VFA-136.

Flight, Flight-Related, and Ground Class A Mishaps
12/14/2006 to 02/25/2007

Date	Type Aircraft	Command
01/26/2007	MH-60S	HSC-23

Aircraft entered water during plane-guard operations. Four fatalities.

Class B Mishaps

Date	Type Aircraft	Command
12/16/2006	FA-18C	VMFA-251

Aircraft aborted takeoff because of engine FOD.

01/06/2007	AH-1W	HMLA-367

During prelaunch procedures, aircraft had main-rotor overspeed on deck.

01/11/2007	SH-60F	HS-3

While enroute to ship, two helos collided in flight. No injuries.

01/17/2007	FA-18C	VFA-97

Hornet's left horizontal stabilizer departed aircraft.

02/05/2007	FA-18F	VFA-106 Det A

Engine FODed after a basket slap during FRS in-flight refueling sortie.

02/08/2007	FA-18E	VFA-143

Tailhook struck turtleback during carrier bolter making tailhook unusable.

02/11/2007	P-3C	VP-92

The No. 1 aircraft engine ingested FOD during maintenance turn.

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Naval Safety Center Data
Cdr. Ed Hobbs
For questions or comments, call Dan Steber
(757) 444-3520 Ext. 7247 (DSN 564)

www.safetycenter.navy.mil/wess/default.htm

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No Excuses for a Lax Attitude

By AD2 Mark Soto

We started the day just like any other aboard Bagram Air Base, Afghanistan, with a maintenance meeting, FOD walkdown and combat flight ops. We all know that deployment life is one filled with hard work and minimal play. We were only one month into our deployment, and already the vigorous schedule was starting to wear on us—complacency was beginning to set in. This story relays how a simple drop-tank removal, done carelessly, resulted in a mishap that easily could have caused serious injury.

About mid-morning, a member of the corrosion work center asked me, as power plants LPO, to download two 300-gallon drop-tanks from the "hangar queen." Without much thought, and in an effort to help out my shipmates, I agreed. What I should have asked myself was, "Why is corrosion directly tasking the power plants shop to do maintenance?" This statement should have been my first clue that maintenance control knew nothing of the intended tank removal because no MAF had been issued for the job.

I asked my Sailors to go ahead and check out all the tools they would need for the job. I also should have made sure they were clear on what they were going to do. Of course, they left the shop without a drop-tank checklist. So one second class, one third class, and three airmen walked out of the shop…sounds like the start of a good bar joke. But there's no joking around when it comes to the absence of common sense and ORM.

They proceeded to the jet to remove the drop-tanks, and the supervisor observing them asked if anyone had checked the tank for fuel. He proceeded to open the fuel cap to verify the tank was empty, and it was safe to release. The tank was dropped, and the supervisor walked over to corrosion work center to help them prepare paint for an upcoming job. During this

"We just released the other drop-tank, and it still was full of fuel."

time, the rest of the drop-tank crew moved to the other drop-tank. Assuming it was empty, like the previous one, and believing it had been checked, they positioned themselves around the tank to grab it when released from the rack.

I was in the shop helping one of my CDIs sign off an oil-pressure gripe just completed on aircraft 523. Since the jet was getting ready to fly, it was my priority. I wasn't able to supervise the tank download, but we had removed and replaced countless tanks in the recent past. My shop always had strived to do things by the book. I trusted they knew how to do the job and had complete confidence in their ability to do this simple task correctly. Unfortunately, I was mistaken.

I was ready to sign off the oil-pressure gripe when one of the airmen assigned to the job flew into the shop screaming, "We just released the other drop-tank, and it still was full of fuel." We immediately ran to the clamshell and located all the Sailors involved, making sure they were all OK. In complete shock, I grimaced as I looked at the scene. On the deck sat a 300-gallon, 2,000-pound drop-tank that had been full of TS-1 fuel. It now was in front of me and gushing profusely from where it had split open. The base hazmat team was quick to respond, and the spill was contained with minimal impact; however, the incident easily could have injured or killed one of my Sailors as it fell to the deck from a height of more than 4 feet.

Fortunately, no one was hurt, but the shop and squadron learned a valuable lesson about what happens when complacency gets in the way of sound judgment and procedures. I learned you can't take anything for granted and must do an ORM review before every task.

Petty Officer Soto works in the power plants shop at VAQ-141.

BRAVO Zulu

Sailors and Marines Preventing Mishaps

Send BZs to: SAFE-Mech@navy.mil

AEAN James Carriere
VAW-115

Airman Carriere was the brake rider on an E-2C Hawkeye being respotted on board CV-63. While the aircraft was being towed across the deck, the tow bar and chain disconnected from the aircraft. This event created a severe hazard to personnel, aircraft and equipment as the 54,000-pound aircraft quickly could have gained momentum on the pitching deck. Airman Carriere immediately recognized the danger and brought the aircraft to a stop, applying brakes and dropping the hook.

AM3 Nino Michdeusen Bacani
VAW-115

Petty Officer Bacani noticed hydraulic fluid leaking from the engine of an E-2C Hawkeye while the aircrew was doing the pre-start checks. He took immediate action and notified the plane captain and crew so he could troubleshoot the problem before the engine starts. When the engine panels were removed, a steadily increasing leak from the propeller pump housing was found. Had this problem not been noticed, the pump housing certainly would have failed in flight, resulting in an engine pitch-lock failure and endangering the crew.

AM3 Brian Whaley
VAW-115

Petty Officer Whaley was the first responder to an airman who had been sprayed with caustic paint-stripping chemicals while doing corrosion control work on the flight deck. He took immediate action to remove his shipmate's contaminated personal-protective equipment and chemically soaked clothing, and then flushed the areas exposed to the chemicals with water.

Recognizing the seriousness of the situation, he rushed the injured airman through a shower to rinse off any remaining hazardous material and escorted him to the ship's emergency room. He then located the appropriate material safety-data sheet and delivered it to ship's medical to ensure the injury was treated properly. His swift response was vital to minimizing the seriousness of the chemical burns and enabled his shipmate to return to work the following day.

AM1 Rochelle Wilks
VAW-115

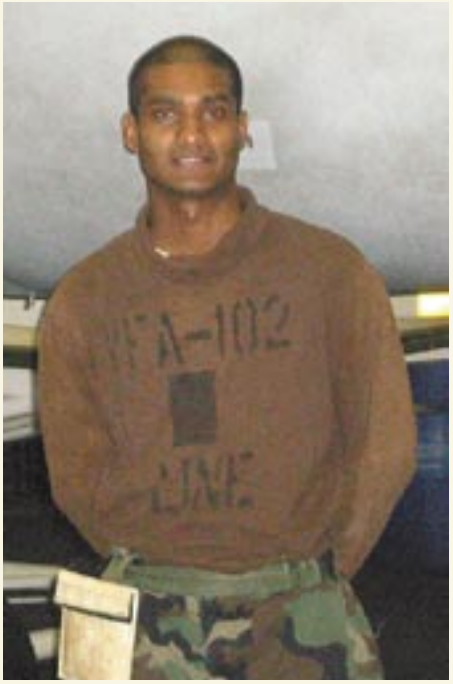
As the Hawkeye's engines shutdown, the blades continued to spin at a lethal rate but without any audible warning to Sailors. Petty Officer Wilks recognized that a maintainer, unaware of the danger, was ducking under the rear stabilator of a Hornet to check the side of the aircraft adjacent to the Hawkeye. Knowing only three feet clearance existed between the spinning blade and the Hornet, she immediately prevented him from walking into the spinning propeller.

AM3(AW) Toby Dial
VFA-136

Following a long and busy day of flight operations on board the USS *Enterprise* (CVN-65) and after a routine re-spot of Knighthawk 307, Petty Officer Dial noticed the port main landing gear tire-and-wheel assembly appeared to be cambered slightly. He relayed his concern to the troubleshooter's LPO, who took a closer look and noticed that the gap where the axle meets the axle lever varied in width around the circumference of the axle. The aircraft was downed and sent to the hangar.

When the tire-and-wheel assembly and axle were removed for inspection, maintainers realized the axle was not lubricated and the axle lever was corroded severely. The grease fitting on the axle lever was jammed and would not allow grease into the affected area.

Petty Officer Dial's keen attention to detail prevented a certain mishap and allowed the quick return of an important asset to support combat mission in OIF.



AMAN Jyoteendra Singh
VFA-102

Airman Singh was assigned as the plane captain of aircraft 111 on board USS *Kitty Hawk*. After a night recovery, he immediately started a turnaround inspection because 111 was scheduled to go on the next launch. The deck crew told him they needed to move the jet. Doing a quick walkaround before the jet was moved, Airman Singh noticed that the right main-mount planing link was cracked and immediately downed the jet.

Airman Singh's attention to detail prevented a definite in-flight emergency and possible mishap. Despite the rush to move the aircraft, his quick but thorough inspection allowed maintenance the time to get a spare ready for the next launch.

AD1 Michael Natividad and AD3 Marlan Hoodwillis
HSL-51 Det. 6

While troubleshooting a faulty fuel precheck valve on Warlord 717, Petty Officers Natividad and Hoodwillis discovered the pressure refuel hose inside the port fuel cell had failed. A portion of the deteriorated rubber lining of the hose became lodged in the refuel/defuel valve, causing it to fail during refueling operations.

Petty Officer Natividad and Hoodwillis' extensive troubleshooting, which was above and beyond normal efforts, correctly identified a serious discrepancy, allowing proper servicing of the fuel cell, preventing an overpressurization of the fuel cell, and avoiding structural damage of the aircraft.

AD2 Conrad Smith
VR-53

Petty Officer Smith discovered two cracks in the aircraft bleed-air ducting during a daily inspection of a C-130T aircraft. While repairing the discrepancy, he determined that FOD had entered the bleed-air system. Additionally, Petty Officer Smith uncovered a broken mounting bracket which led to the discovery of two more faulty brackets in other squadron aircraft.

Petty Officer Smith's thorough maintenance inspection technique eliminated possible fire and FOD hazards.

AME2 Nathan Green
VFA-151

While doing a low-power turn on Vigilante 302 to leak check the environmental control system after a recent maintenance action, Petty Officer Green discovered an abnormally hot area on the underside of the aircraft. Calling for an immediate shut down of the engine, he noticed the paint and panel in the same area began to bubble and warp. Removing the panel, Petty Officer Green expertly traced the extensive series of ECS lines to the root of the problem: an improperly placed clamp hidden deep within the belly of the aircraft. His discovery of the bleed air leak prevented any further damage to the aircraft and the inevitable loss of aircraft and possibly the pilot.

AM1 Daniel Kearns
VR-53

On an early morning mission, 0430 brief for a 0630 takeoff, Petty Officer Kearns completed his preflight and engine starts as a C-130T loadmaster. He re-boarded the aircraft and during his post engine-start checks discovered sparks coming from the No. 2 engine tailpipe. Petty Officer Kearns notified the flight station who immediately shut down all aircraft engines.

A borescope inspection revealed signs of an impending turbine failure, including hot spots on the turbine and burner cans, a delaminated burner can, and cracked blades.

Had Petty Officer Kearns not noticed the sparks coming from the No. 2 engine during the final checks, the turbine may have failed in flight, possibly resulting in additional damage to the aircraft or loss of an aircraft and crew.

AM2 Shawn McNeal
VR-46

While doing maintenance on C-9B 161530, Petty Officer McNeal found that a new landing-gear, unlock-assembly component was improperly configured. Had the component been installed, it would have prevented safe operation of the landing gear, causing the port main gear to wedge in the up position.

Petty officer McNeal's knowledge, initiative and dedicated attention to duty prevented this serious condition from occurring.

AEAN Curtis Sanders
VX-23

During a daily and turnaround inspection on an FA-18C before an afternoon flight, Airman Sanders discovered a sheared bolt on the swivel assembly for the starboard main landing gear. This bolt is a vital part of the assembly that attaches three separate landing gear actuator hydraulic lines to the upper side brace of the gear. Realizing the critical nature of this discrepancy, Sanders immediately advised maintenance control to down the airplane, while initiating a MAF for the airframes workcenter to correct the situation.

Had the discrepancy gone unnoticed, a complete hydraulic failure could have occurred to the landing gear system, resulting in a catastrophic hydraulic leak.

AO2(AW) Sean Nolan and AO2(AW/SW) Ginger Waters
VFA-87

During a routine hot brake and de-arm evolution, aircraft 403's starboard main tire ruptured because of overheated brakes. Petty Officers Nolan and Waters expeditiously signaled the pilot to stop the aircraft, secure the motors, and get out, while simultaneously securing the area and extinguishing the smoldering main mount with a Halon fire bottle.

The focused attention and quick actions of Petty Officers Nolan and Waters prevented significant damage to the aircraft and possible injury to the aircrew.

AM2 Juan Rosasbarca, AM2 Willie Harmon, and Airman Thomas Daly
HSL-51 Det. 6

Petty Officers Rosasbarca and Harmon and Airman Daly discovered the port and starboard drag-beam bushing were worn beyond limits on Warlord 717. The excessive wear and tear on the bushings could have resulted in failure of the main landing gear and possible injury to the flight-deck crew onboard the USS *Lassen* (DDG-82).

Their thorough inspection and by-the-book work ethic quickly identified a serious problem. A depot-level repair team was brought in to assist in the repair while the ship was in port, ensuring minimal down time.

CROSSFEED

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Maintenance Management

IMRL 101

By ADCS(AW) Michael Tate

Many individual material-readiness-list (IMRL) managers or petty officers just seem to land in the job. Some have completed the course, but so much information is coming at them so fast it doesn't stick. Other people come to work one day, and they're handed the job. It's easy to see how overwhelming this task can seem, and the program suffers until these people become familiar with it.

Fortunately, two instructions exist that will help the cause: COMNAVAIRFORINST 13650.3 and the NAMP, Volume V. You might have to blow the dust off both, but do it. I will share information with you to make your programs better.

What magic formula exists to beat this beast? Nothing but hard work and the references provided. Too often, people who are given a position of authority won't ask for help or admit they don't know an answer. We want to be viewed as a "go to" Sailor who always has the right answer. You have to get past this point. Asking for help doesn't mean you don't know your job. This new position is unfamiliar and not something learned in school.

IMRL is critical to our operational readiness. Only limited assets exist for each TMS aircraft, and they must be accounted for and taken care of. Seek out others who have figured out the program. Yes, you might have to hunt around a little. But the 13650.3 (enclosure 19) provides a list of people who can help—including the support-equipment controlling authority (SECA). Another person to ask, for most squadrons, likely is your wing IMRL manager. Most wings are proactive and actually are doing some of the daily management for you in the local asset management system (LAMS).

A key issue is making sure your "main body" is not more than 18 months old. Possibly, it could be less than the 12-to-18 month timeframe if you've had a lot of activity, like transitioning to a new aircraft, series changes, or had a major change in SE requirements. If you need a copy of your main body, ask the SECA to provide it. When you get it, check the date because supplements may exist. For example, it's November and the date on the main body is May. You should have supplements for June, July, August, September, and October. If they are missing, contact the SECA again.

Looking at the main body, you may notice numerous pencil marks (a best practice), providing it has been used or updated regularly. These marks will reflect the changes transferred from the supplements to the main body. This list is your master document and always should be up to date. If it does not contain these changes, then you should work the supplements into the main body—one month at a time and in order (June, July, August, etc).

IMRL gear is moved in and out of a command with transaction reports (T/Rs)—a checklist is available in the NAMP (Volume V, Chapter 19.2b(1) and (5), Figures 18-1 and 18-2). It should be used for all gear coming in or leaving a command (deletes in some cases are done as a best practice, when transferring the item, even if it is to DRMO). This step should be done for all gains and prime adds. The checklist should be routed in the order listed on the form, starting with QA and indicating the applicable manuals for the gear and what periodic maintenance shall be done. If this step is missed, then it indicates that your SE planned-maintenance

system needs to be repaired. The IMRL manager plays a key role in SE/PMS, too. For prime deletes, the checklist serves as a tool to make sure the work center (via QA) responds, stating they do or do not still need the item. If needed, the item can be transferred to the special tool side of the tool room. If not, then the PM record, along with the gear, can be pulled to await disposition.

When IMRL gear moves into or out of the work center and tool room, the LAMS report also must be updated to make sure you know where the gear is located. LAMS has two great management tools: barcodes and item pictures. No one can remember what every IMRL item looks like, and the slang terms that are used make it hard, too. A picture speaks a thousand words, so a best practice is to have photos of every item in the database.

Work-center IMRL petty officers and NCOs should be able to complete a quick quarterly inventory. They also should make sure the annual inventory is available in the shop, along with their quarterly inventory, which acts as their working copy. If an item has moved to a different shelf or box in the work center, the shop must tell the IMRL manager to make sure the appropriate change is made to LAMS, using the "location" and "local use" fields. They need to make sure items are in working (RFI/RFU) condition. If not, they need to be reported to the IMRL manager immediately, using one of the "F" codes found in the 13650.3, enclosure 16, paragraph 3. If an item is in "F" condition, the command must see if they can fix it, or they must start replacement procedures. If that item is source codes (SM&R) "M" or "A," they shall be manufactured or assembled locally. Drawings can be obtained from NATEC (see the procedure in enclosure 9, paragraph 5). The command needs to take whatever action is necessary to fix or replace these items. The IMRL manager must track these items to make sure they aren't sitting idle on a shelf.

While working the main body and LAMS, you'll find a little redundancy, but that result is normal. Using the information I've provided will eliminate 90 percent of the problems the fleet faces. Remember to keep the main body up to date, using the supplements. Put the locations in LAMS, and never put the gear in service without routing the acceptance or transfer checklist. Do the basic steps shown, and you'll be on the right path for IMRL and operational excellence.

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

Quality Assurance

Do You Know Where HMRs Are Supposed To Go?

By ATC(AW/SW) Danny Williams

According to the NAMP (Volume I, paragraph 14.8.2.c), QA is required to collect and provide maintenance and material data necessary to the safety officer for reporting via OPNAVINST 3750.5, when a report is required.

The safety officer is the expert on deciding when a hazrep should be submitted. If QA is not sending data to the safety officer when they submit an HMR, how does a squadron know they also may need to submit a hazrep?

The Naval Safety Center surveyed 72 commands around the fleet and asked the question, "Is the safety department informed when maintenance submits an HMR?" Only 51 percent of the safety officers said they were being informed.

When an HMR is required, a hazrep often is needed, too. If we don't pass along this information, then the Navy is losing valuable data. The information from a hazrep could keep other commands in a community from making the same mistakes. Analysis of this information can save lives and reduce mishaps.

We need to help each other to get out this critical information and to comply with the NAMP. It could make a world of difference.

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

Avionics/Electrical

Joint-Services-Wiring Action Group (JSWAG) Addresses Fleet Issues

By CWO4 Ron Stebbins

The JSWAG and Joint Fiber-Optics Working Group (JFOWG) are collecting fleet wiring and fiber-optic issues and addressing them through program and logistics managers at the Naval Air Systems Command.

JSWAG has identified the leading causes of wire failures: exposed conductors, arcing damage, improper repairs, and chaffing. To enhance fleet readiness, the wiring manual was updated in a joint format. The Navy's update is NAVAIR 01-1A-505-1, and NATEC issued change No. 1 in November 2006.

Other updates: The Navy has developed computer-based training for wiring repair through a NAVAIR 6.7.5.2 fleet-training initiative. As the less reliable thermal circuit breakers are being phased out, the JSWAG is continuing the arc-fault circuit-breaker updates on C-9, H-53 and FA-18s. Aging wire studies are being done on P-3, H-1, and E-6s, using reliability-centered-maintenance (RCM) analysis to minimize wiring failure costs. NAVAIR's support-equipment team (PMA-260) has been busy developing a new automatic-wire test set (AWTS) for I-level maintenance, and a fiber-optic test set (FOST). These new or updated tools should enhance repairs and reduce failures at repair sites.

As more aircraft and systems are updated with the latest fiber-optic technology, the JFOWG recognizes cabling failures will begin to increase. They are preparing for this eventuality and are pursuing enhanced repair methods. To that end, they are doing thorough reviews of fiber-optic issues with the FA-18, F-35 and C-130s. For more information on wiring issues, contact the following personnel:

Jerome Collins
NAVAIR 4.4.5.3, JSWAG Co-Chair
jerome.Collins@navy.mil
(301)342-0812

AOC(AW) Rich Burry
NAVAIR 6.7.5.2, Fleet Training
richard.burry@navy.mil
(301)757-3108

Warrant Officer Stebbins is the avionics division head at the Naval Safety Center.

Batteries, Batteries and More Batteries

By ATC(AW/SW) Danny Williams

Who's in charge of batteries for the entire squadron? The answer is the avionics battery-program manager…of course. It's amazing how many people in the fleet don't know that fact.

Who uses the batteries? Where are they stored? Where and how are they disposed of? These questions begin to show the scope of that person's responsibilities.

How many different kinds of batteries exist? The most common ones, in no particular order, are lithium, ni-cad, lead-acid, nickel-metal hydride, and alkaline. It's important to know this information because storage requirements are different for each one.

Lithium batteries may not be stored in a manned space because they can vent toxic fumes. They also cannot be stored with other types of batteries. Lead-acid may be stored in a work center for no more than 24 hours. Unless in California, alkaline batteries have no real requirements for storage or disposal. Storage requirements for batteries, other than lithium, are found in NAVAIR 17-15BAD-1.

Lithium batteries are a mainstay in survival equipment because of their large power capacity and long life. However, they are volatile and have special instructions for handling, storage, use, and disposal. Those requirements can be found in NAVSEA S9310-AQ-SAF-010. If you haven't seen

that pub, save yourself future headaches and find, read, and live it!

Few squadrons store batteries correctly, and even fewer commands have correct procedures in place to handle a battery spill. Every squadron is required to have a spill kit, and it must be set up in an accessible space that contains premixed neutralizers for lead-acid and ni-cad spills.

These problems are just a few that I've seen in my short time at the Naval Safety Center. I'll continue to share my findings in future articles and offer solutions to help.

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

Tools

Clear Case for Clear Grease Guns

By ASCS(AW) Phil LeCroy

Have you ever walked out to a job site to grease a piece of support equipment or an aircraft and discover the gun had the wrong type of grease, or the secondary warning label had fallen off again? What about the antique grease gun the tool room issued that doesn't work for various reasons? Or the command with only two of them, one checked out to Smith and the other one to Jones who just drove over it on a tractor, ending its life? Being a hard charger can be frustrating at times.

These problems soon will be solved with an innovative new grease gun. And although we don't endorse specific products or manufacturers at the Naval Safety Center, we do want to make the fleet aware of any new product with significant safety features or that will save money over time. We have found a new, clear grease gun that appears superior in every way to the metal ones found around the fleet.

These new grease guns were designed to fulfill the needs of the military. Clear Grease Guns, Inc. and Lincoln Industrial Corporation have developed this new product that is made of a high-strength, resilient polycarbonate, with aircraft aluminum end caps. They are produced with "memory" that snaps back to the original shape after being compressed.

The clear design is important because high-tech machines can be lubricated with the wrong grease, requiring costly tear down to flush bearings and joints. We already have too much work to do without adding

A three-ton truck can't crush it.

It survives with only a scratch.

unscheduled, self-inflicted work. The new product allows the user to see the type of grease being used, check the quantity remaining, and can be used with bulk grease or a cartridge. The gun also has a filler and bleed valve for clean filling or purging trapped air pockets. It also comes with a rigid tube and high-pressure flexible hose.

We tried to test the "memory" feature of the grease gun at the Naval Safety Center, but it defied all attempts to compress the polycarbonate. We struck it against a large metal object, put it in a vise, and parked a three-ton truck on top of it. These tests would have destroyed a metal gun, but we only could scuff it. The product is durable and should stand up to anything an overeager maintainer can dish out. This tool has been tested in the fleet, too. Here are some of the positive feedback reports that have been received on its ease of use and durability.

"My opinion on the grease gun you showed me a few weeks ago is that it is a superior alternative to our current equipment. The quality is 10 fold what we currently use. In addition, the available options offered will increase productivity and safety," said a maintainer from HMM(T)-164.

Another mechanic said, "I believe that this grease gun is the way of the future for Marine and naval aviation. I wish that we had had these when I was a young flight-line mechanic. Just the safety aspects of the grease gun far surpass any other."

Others echoed this theme, "Recommend making this grease gun the new standard-issue equipment. Very impressed."

The clear grease guns soon will be available in the supply system (under "Transparent grease gun").

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

Class C Mishap Summary

By ADCS(AW) Michael Tate

From Dec. 15, 2006, to Feb. 14, 2007, the Navy and Marine Corps had 13 Class C mishaps involving 13 aircraft. These mishaps are all under investigation, so specific reports can't be discussed.

A trend in this quarter's mishaps could be identified: lack of attention while handling and moving aircraft and removing components. A common problem is not ensuring enough clearance exists when accomplishing these tasks. We end up with dinged, bent, dented, and smashed aircraft, equipment and people.

How many times have you walked past an aircraft and have seen someone removing a component without a lifting adapter, when you know one is required? In the past, that job might have been completed successfully using a shortcut—maybe even faster than with the right equipment. That success is a problem because a culture and norm gets established. All of a sudden, it's OK to do it that way, even though it's not "by the book."

That method depends on luck, and someday that luck will run out. When it does, we have an injury, damaged equipment, or an aircraft loss. When maintainers make those poor decisions, manuals get "written in blood."

Aircraft moves are done correctly 80 percent of the time. Unfortunately, 20 percent of the time our people ignore infractions and don't stop the move. We see people moving aircraft without whistles in mouth, wing walkers talking about any subject but the move, or people just staring at the deck, rather than being alert and taking care of the move. Tow-tractor drivers aren't paying attention to the director, and directors accept it. Or worse, our senior petty officers walk past and don't challenge these bad maintenance practices.

The fixes to these problems are simple and can be found in the core values of the Navy and Marine Corps: honor, courage and commitment. Leaders must lead, supervisors must supervise, and workers must do good, safe work. Honor implies you value the safety of people and equipment. You must have the courage to confront those people or situations who threaten safety. And you must have the commitment to do the best job possible, preventing bad maintenance practices from becoming the norm.

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

Helping Sailors and Marines Help Themselves

Sierra Hotel

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

Safety Surveys

VFA-136	HS-15	MALS-26
VAW-121	VR-58	HMM-263
VP-30	VFA-87	VMAT-203
HSC-48	VAW-124	VMA-542
AIMD Mayport	VFA-213	VMR-1
VS-32	VMAQ-3	VFA-211
HS-11		

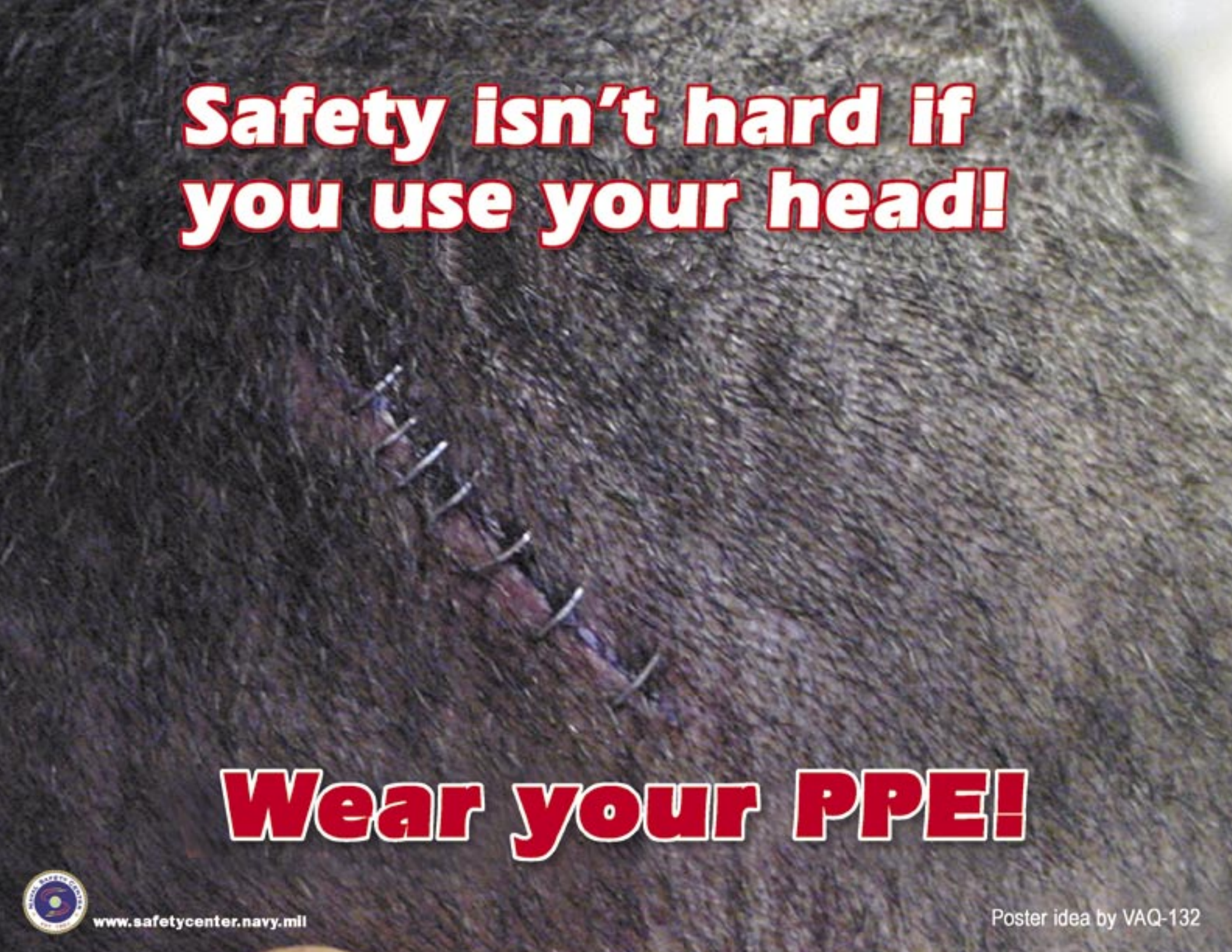
MRMs

VFA-87	ASO	VR-58
VR-54	VR-53	VX-30
VC-6	VAW-121	VAW-115
AIMD Norfolk	VFA-211	

Culture Workshops

VMA-223	VFA-211	VFA-102
VMFA(AW)-224	VP-30	VFA-146
AWSTS	VP-45	VFA-195
CMO	HSL-51	VFA-41
HS-3	VAQ-133	VQ-1
HSL-40	VAW-116	VR-53
VAW-121	VAW-117	FRC Norfolk
VFA-15		

For more information or to get on the schedule, please contact: Safety Surveys: Capt Chris Foley, USMC at 757-444-3520 Ext. 7223, MRM: AEC Matthew Cooper at 757-444-3520 Ext. 7275, Culture Workshop: Cdr. John Morrison at 757-444-3520 Ext. 7213.



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Poster idea by VAQ-132