The Navy & Marine Corps Aviation Maintenance Safety Magazine

Mech

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Warnings Are Given for a Reason

Missed Opportunities

ORM for the Maintainer

The Navy & Marine Corps
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Mishaps cost 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 magazine's goal is to help make sure that personnel can devote their time and energy to the mission. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is hazardous; the time to learn to do a job right is before combat starts.

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Navy photo by MC2 Daniel Barker

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Front cover: Aviation intermediate maintenance department's (AIMD) jet shop tests an F/A-18F Super Hornet jet engine on the fantail aboard USS *Kitty Hawk* (CV-63). Navy photo by PHAN Thomas Holt

Correction: The author of "It's Not Running Right" in the Fall issue of *Mech* requested to give credit to AOAN Matthew Lester for being the maintainer who extinguished the fire mentioned in the article.

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Seventh Annual Aviation Maintenance Safety Conference

By Cdr. Bert Ortiz

Calling all maintenance, quality assurance and safety professionals at Navy and Marine Corps aviation commands. Mark your calendars for the Seventh Annual Aviation Maintenance Safety Conference from 7 through 10 April 2009. It will be at Vista Point conference center, located at 1754 Massey Hughes Drive, Building Q-88, Naval Station Norfolk.

Last year's conference drew more than 180 personnel from Navy and Marine Corps units worldwide. I hope this year's group will be even larger. The goal is to raise fleet-safety awareness and to improve readiness and mission accomplishment. In addition to NSC products and presentations, this conference offers one of the few opportunities to share and distribute a broad range of aviation-maintenance information to aviation-maintenance professionals in the fleet.

Topics include aviation maintenance program feedback, future procurement updates, NAVOSH and ORM-program-guidance information, and suggested maintainer tools and practices. Several vendors also will be there, showing new products available to the naval-aviation community.

The conference will be limited to 250 seats, so reserve yours as soon as possible. Register by logging onto www.safetycenter.navy.mil, click on the aviation menu, scroll down to Hot Items, Seventh Annual Aviation Maintenance Safety Conference, and click Register Here. You also may register by calling or emailing any Naval Safety Center Code 12 representative to reserve your seat. Our phone number is (757) 444-3520 (DSN 564). Registration deadline is 18 March 2009.

A non-refundable fee of $65 will be collected by MWR on the first day of the conference. This fee covers a continental breakfast, snacks, drinks, and a buffet lunch each day of the conference.

Hope to see you there. Keep your head on a swivel. Be safe!

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

In This Issue: Operational Risk Management

By LCdr. John Ruane

This issue highlights the importance of operational risk management, ORM. It's a vital tool for your toolbox. If you think of risk management as a tactic that enhances mission accomplishment, you can see that we use it daily, normally without giving it much thought. We can and should use this tool on the job to improve mission effectiveness and to reduce risk. We owe it to ourselves to apply ORM in our daily lives when we are off duty, as well.

It never ceases to amaze me that every preventable mishap always reveals a lack of ORM in the planning and decision-making process. Fortunately, the information is reaching the fleet, as you will see in some of the following articles. However, we have a long way to go. 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. Use ORM, and you'll save time, money and lives.

It's been my honor and privilege to serve as the editor of *Mech*, but it's time for me to move on for my department-head tour. Keep sending your stories, BZs, and suggestions to the new editor because this is your magazine. Each article that you submit makes a positive difference.

Send articles, BZs and letters via email to the *Mech* staff at SAFE-Mech@navy.mil.

LCdr. Ruane is the strategic planning division head and *Mech* magazine editor at the Naval Safety Center.

Head Over Heels for ORM

Navy photo by MCSN David Danals

By AN Christopher Green

It was a normal night in the VFA-103 corrosion-control work center aboard USS *George Washington* (CVN-73). The night-shift supervisor had instructed me and my co-worker, AN Garcia, to go to the flight deck to scrape rain erosion off the leading-edge flap antenna on aircraft 207. We grabbed our float coats and cranials and went up to get to work.

Neither of us ever had done this task before, and we didn't bother to ask for guidance. We thought, "How hard could it be?" I climbed on top of the jet and lay across the left wing, looking over the leading edge and with my feet pointing toward the trailing edge. I planned to scrape from the top of the antenna, while AN Garcia scraped from the bottom.

When we realized we only had one scraper, AN Garcia went below to get another one. While he was gone, I noticed I was sliding a little bit on the wing as the carrier rolled in light seas, but I didn't think it was too dangerous. I continued scraping, but all of a sudden, I slipped forward again, and I knew I was going to fall this time. I tried to brace myself as I went over the leading edge of the wing headfirst, but there was nothing to hold on to. My body was almost vertical when I hit the flight deck facefirst. As soon as I hit, I remembered looking next to me and seeing a tooth lying on the flight deck. I picked it up and put it in my pocket (teeth are FOD, too.) Then I passed out.

AN Garcia and AT3 Quijano were the first ones there. They noticed I wasn't responding, so AN Garcia immediately told the nearest yellowshirt to announce a medical emergency. As the yellowshirt blew his whistle to stop the move he was directing, I woke up. The medical-emergency team was called away, and I was taken to medical for a thorough evaluation. Thankfully, nothing was wrong with me, except for the tooth in my pocket and two other broken teeth. Dental was able to put my tooth back in, and it looks like I'll get to keep it.

This accident never should have happened, and it's taught me to apply risk management to everything I do. A ladder would have been a good starting point. The next time I get assigned a task I've never done before, I'll be sure to ask a more experienced member of my shop for guidance, and I'll think about how to accomplish everything I do in the safest way possible. I should have asked myself, "How can I get hurt during this task, and what can I do to reduce that possibility?"

Airman Green works in the corrosion-control shop at VFA-103.

Warnings Are Given for a Reason

By AM2(AW) Joshua Cox and AM2(AW) Kyla Brent

While accelerating through 100 knots on takeoff roll, an FA-18F lost power, and a loud bang was heard all the way back in the hangar. The aircrew executed their aborted-takeoff procedures, suspecting that the port engine had just been FODed. The aircrew stopped the aircraft and secured the port engine. After the aircraft was towed back to the hangar, an investigation into the source of the FOD damage was commenced. Initially, it was thought the aircraft may have sucked up a chunk of asphalt or a bolt or screw that was left on the runway.

No one suspected negligent maintenance until personnel noticed the port nose tire looked strange. A dust cover was sticking out over the bearings. Maintenance Control and the airframes work center immediately were notified of the discrepancy. It was apparent the metal retaining ring that holds the dust cover over the nose-wheel bearings had popped out and was nowhere in sight. The ring probably had gotten sucked down the port intake and into the engine.

During installation of the nose tire, a metal spacer fits between the lock ring and the outboard side of the bearing. This metal spacer allows the bearing to seat when the axle nut is tightened. There is a warning in the maintenance instruction to ensure this metal spacer is installed correctly: Not doing so could result in failure of the wheel bearings.

But what had happened to the metal spacer? Once the port nose tire was removed, it was discovered that the metal spacer was installed wrong. The metal spacer was on the inboard side of the tire, which didn't allow the bearings to seat. The bearings had worked loose and pushed out onto the dust cover. The pressure on the dust cover was so great that the metal retaining clip popped.

The investigation uncovered several procedural errors by maintenance personnel. The tire had been changed the day before during a busy flight schedule. Consequently, maintenance control was pushing to quickly complete the maintenance procedures so the jet would be ready for an upcoming flight. The AM2 who changed the tire had done this procedure hundreds of times before and didn't feel the need to follow the step-by-step procedures on how to change the tire. Also, the procedure was completed without having the requisite CDI present. The CDI is supposed to be there to check the tires received from supply, to verify force applied to tighten the axle nut, and to make sure the bearings are wrapped in wax paper (which protects the bearings from the elements before installation).

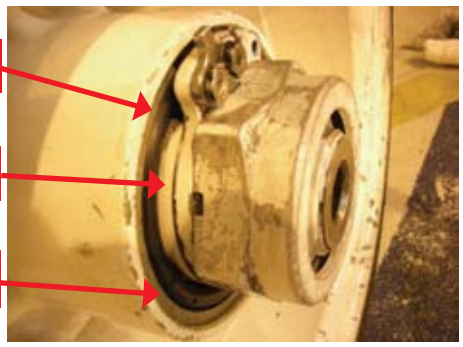
The part numbers on the bearings are supposed to be identified and documented before installation, because you can't read the numbers after the part is installed. The CDI did not cross-check nor record the part numbers to verify that the correct bearings were installed. Finally, the maintenance crew failed to tell maintenance control they didn't have enough time or personnel available to perform the procedure correctly. If the five steps of ORM had been applied, this entire situation easily could have been avoided.

- **Step 1—Identify the Hazards**

This job was so routine the maintainers didn't think anything could go wrong. They failed to identify the following hazards: complacency, being rushed, not using publications, and operating without a CDI present.

- **Step 2—Assess Hazards**

Procedures and standardization are put in place to



protect us from making mistakes. Warnings are given to capture our attention and to remind us of the possible hazards and consequences.

- **Step 3—Make Risk Decisions**

The risk decision in this case was to compromise policy and safety in order to make the flight launch on time. Hurrying to get an aircraft flying should never take precedence over procedures.

- **Step 4—Implement Controls**

In aviation maintenance, policies and procedures are controls put in place to save lives and prevent mishaps. Policies are written with checks and balances for every job. If these policies are overlooked, the likelihood of a mistake is increased greatly.

- **Step 5—Supervise**

During every maintenance evolution, the CDI is required to be the supervisor. Subsequently, there is a rigorous set of tests and a challenging interview process to complete before becoming a CDI. CDIs are experienced technicians who have extensive experience and are expected to understand and enforce procedures.

The chain of events that led to this incident could have been broken at several points. Because of the shortcuts and oversights by the technician and a CDI, countless man-hours were lost replacing a FODed engine and a set of nose tires, investigating a mishap, and conducting NJP. These mistakes cost the Navy more than $800,000 in damages—a Class B mishap.

Petty Officers Cox and Brent work in the airframes shop at VFA-106.

Hmm—This Doesn't Feel Right

By PR3 Matthew Ashby

My chain of command constantly tells us to stop the task and investigate the problem if we ever notice something that doesn't seem quite right. Recently, I put these words of wisdom to use.

I had to do a routine 360-day inspection on an aircrew-survival vest. While removing the LPU-36 from a survival vest, I noticed something was different about this particular LPU. On one side of the horse collar, near the beaded handles, I was able to bend the lobes more than normal. The lobes felt soft and pliable, as if the CO_2 cartridges were not installed. Normally, you can feel

the cylinder cap, or you can try gently bending the lobes to feel for the cartridges. I decided to check another LPU to see if there was a difference. The second LPU was quite firm and did not bend nearly as easy. I checked a third LPU to confirm my findings, and it was firm, as well.

I immediately notified Maintenance Control and my leading petty officer. My LPO inspected the LPU, and he could not feel the CO_2 cartridges, either. Squadron personnel are not authorized to open and inspect the CO_2 cartridges inside the LPU, and there are no O-level procedures for inspecting them. My LPO carried the LPU to the local AIMD to notify their production control and QA divisions. During the AIMD inspection, my suspicions were confirmed: no CO_2 cartridges were inside the LPU.

The publications do not cover checking for the CO_2 cartridges during O-Level maintenance. A little extra attention to detail using ORM, and going beyond what was required in the maintenance publications enabled me to make this potentially life-saving discovery. If an aviator had worn this LPU during an over-water ejection, he or she may have drowned if his LPU had failed to inflate, and he wasn't able to do it manually.

VAQ-137 Safety Officer note: *After PR3 Ashby's discovery of the missing cartridges, Fleet Readiness Center Northwest released an ALSS HMR message. VAQ-137 released an aviation hazrep to all aircraft type, model and series that wear the LPU-36 life preserver. PMA-202 issued several aircrew bulletins to inspect all flotation devices inspected by the CDI that certified the LPU-36 with the missing CO_2 cartridges.*

Petty Officer Ashby works in the PR shop at VAQ-137.

BRAVO ZULU

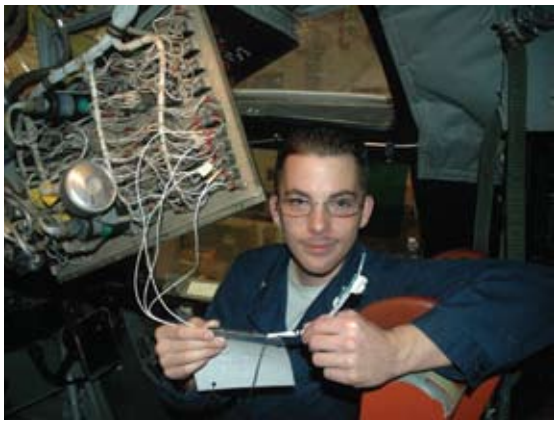
Because of Petty Officer Ashby's discovery, a fleetwide advisory was released to notify the aviation community of this potential hazard.

Shortcuts Can Kill

By AE3 Corey Ross

I'm a P-3 maintainer stationed in Kaneohe Bay, Hawaii. One night, I reported for my shift at 1430 to Consolidated Maintenance Organization TWO (CMO-2). I was the only night-shift CDI that night. Shortly after arriving, I was asked at the maintenance meeting if the post-ISIS (isochronal scheduled inspection system) alternate fire-warning checks had been performed and if the card for the ISIS had a CDI in-process MAF written.

I checked the pass-down log and called the weekend day-shift supervisor to verify its completion. The maintenance checks had been done on Saturday by the weekend-maintenance crew. The day-shift supervisor explained that the checks were completed by the weekend night-shift crew and that the pass down he had received indicated the checks were good. He told me to go to aircraft 407 and verify that the checks had been completed and to check the voltage on the engine-run sheet. I went to Quality Assurance and verified the run sheet (the voltage was recorded within limits).



Things were very busy that night (especially since I was the lone CDI), so instead of going to aircraft 407 to verify that the harness was removed, I assumed the day-shift CDI had removed the harness from the overhead panel. I completed the CDI in-process section and then signed off the ISIS work order.

I later learned that removal of the alternate fire-warning harness did not require a CDI in-process step. Instead of submitting a TPDR to NATEC to recommend incorporating a CDI in-process, I made a personal decision and added a completed CDI in-process step on the MAF. This saved me time, but I had cut a corner. As a result, aircraft 407 had its post-maintenance check flight with the harness still installed. The aircraft completed the FCF with the harness in place, and it was not discovered until the next aircraft pre-flight.

A P-3 Orion can carry a maximum of 23 Sailors, all of who could have lost their lives due to my inability to remain committed to quality maintenance. I learned a difficult lesson and wanted to stress the importance of thorough maintenance procedures and the consequences of accepting anything less.

I now realize I was overwhelmed with work that night, but instead of slowing down and applying ORM to the maintenance process, I chose to use the publication for my benefit. Hopefully everyone will learn from my mistake and realize that using shortcuts only speeds up the time it takes to lose everything.

Petty officer Ross works in the avionics shop at CMO-2, Marine Corps Base Hawaii.

Missed Opportunities

By AOAN Jason Young

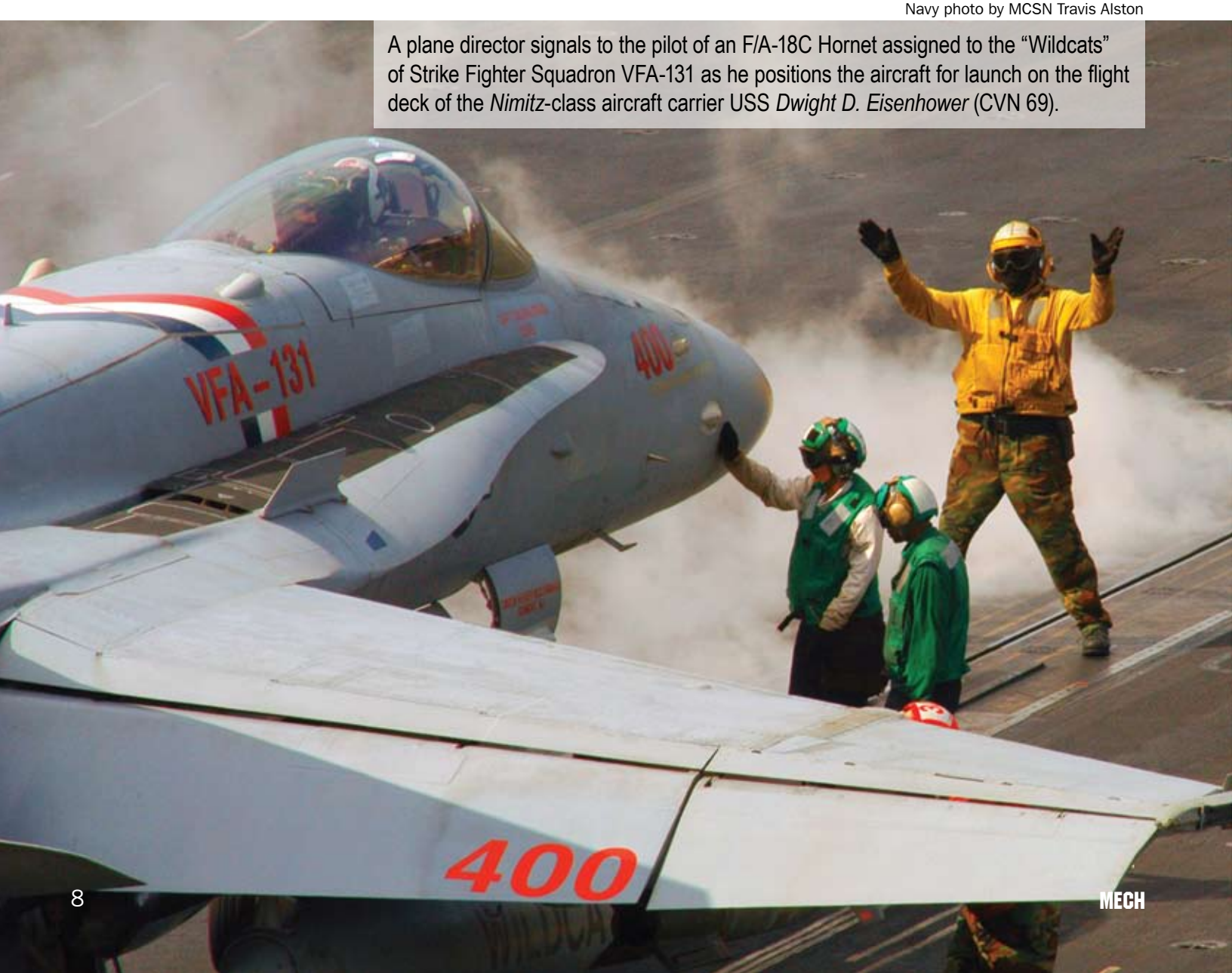
Excruciating pain, a couple of broken toes, injured muscles, hours of physical therapy, missing our cruise to South America, not being able to play softball or football at the command picnic, limited mobility, gaining 15 pounds of fat from not being able to workout. These are a few things that could have been prevented if I had paid more attention to my surroundings and had applied the principles of ORM. I also wouldn't have heard, "Hey, what happened to your foot?" every five minutes.

We had completed the first week of TSTA and had readied the last bird for the night launch. I had been given the great privilege of working on the CAG arm and de-arm team, and I wanted to do the best job I could by going the extra mile.

It had been a long day, and I just wanted to get that last bird launched so I could get off the flight deck. While one of my squadron's aircraft taxied to the catapult, I thought I saw something wrong with one of the IMER stations. I walked over to it, hoping I could fix something someone else had missed. I advanced from behind the station, passing the main-mount landing gear to avoid getting too close to the intake. I looked at the yellowshirt as I approached and I assumed he had seen me underneath the aircraft.

That assumption caught me. Going inside the

Navy photo by MCSN Travis Alston



A plane director signals to the pilot of an F/A-18C Hornet assigned to the "Wildcats" of Strike Fighter Squadron VFA-131 as he positions the aircraft for launch on the flight deck of the *Nimitz*-class aircraft carrier USS *Dwight D. Eisenhower* (CVN 69).

station, right next to the intake, I didn't realize how close my foot was to the main mount of the jet. After I had double-checked the IMER (there was nothing wrong with it) I started to move out of the way but realized my foot was wedged under the main mount. Going into panic mode, I frantically waved my wand to let the yellowshirt know and yelled, "Hey, I'm underneath the jet!" He never saw or heard me, though. I watched in horror as the 15-ton aircraft taxied forward and ran over my foot.

My initial thought was, "Oh dear Lord, I just lost my foot!" I felt heat in my boot, and my foot was swollen. Frantically, I waved at the closest yellowshirt and pointed at my foot. He quickly had two people carry me to flight-deck medical. Initially, I hadn't felt any pain; I just wanted to get down off the flight deck before anything else went wrong! I guess adrenaline helped me maintain my cool, but when they got me to medical and removed my boot, the pain really kicked in. While they checked my foot for damage, I noticed a large gash spewing blood on the right side. Automatically I thought, "Great, I have a compound fracture," but when I didn't see a bone sticking through the skin, I became curious. The doctor told me that because the pressure was so great on my foot, the blood and fluids had no where to go but outside my foot.

I couldn't believe it; that jet had popped my foot like a grape. After waiting for what seemed like forever for any kind of pain relief, they finally had took some X-rays. I seriously thought I wasn't going to have a foot anymore, but that wasn't the case. In fact, I was pretty lucky. Because of my steel-toed boots, I was able to "walk" away. However, my injury still was still serious; I had a shattered pinky toe and major muscle and soft-tissue damage. Almost two months later, I suffered from intense pain and limited mobility.

The incident occurred during a routine check of the jet to make sure everything was armed and nothing was loose or missing. It was just TSTA, and we weren't flying any live ordnance for that event, only CATM 9s and Mk-76s. However, there are established procedures for checking over an IMER loaded with Mk-76s. It is something that is done before the aircraft ever leaves its chocked and chained position. During training, the senior chief from CAG had warned my team, "Never check the IMERs when the aircraft is on the catapult because it will put you in danger."

My injury easily could have been prevented if I just had paid more attention to my surroundings. I should have kept my head on a swivel, instead of assuming someone was going to be watching over me while directing a multi-million-dollar piece of equipment. In the end, being more cautious and not letting complacency kick in could have saved me some serious agony.

Maybe by focusing more on the mission at hand than wondering what they were going to serve at mid-rats would have saved me a lot more time to do the things I wanted to do, instead of spending all my time in and out of medical for appointments and physical therapy. I would have been able to see South America with the rest of my squadron. I still would have had the privilege of working with the CAG arm and de-arm team. More importantly, I would have had been able to do what I wanted, instead of having to wait for people to take me where I needed to go.

Taking a cat shot off the boat in a COD and being able to get plenty of rest seems like the "rock star" life for a person in the military, but it wasn't worth all the pain, suffering, and loss of time I've had to endure the last couple of months. While my friends and co-workers were out exploring the coasts of South America, I sat on watch with my foot elevated writing this article. I know my injuries could have been worse, but more importantly they could have been prevented.

Airman Young works in the ordnance shop at VFA-131.

Benny Suggs Award

Payback for Thinking Outside the Box

By Lt. Brian Berg

In the world of aviation maintenance, procedures are done in a standard way when dealing with everything from the smallest PMS to the largest depot-level jobs. Although, as two petty officers from the VAW-126 Seahawks found out, sometimes it pays to think outside the box and get away from the rigid by-the-book methods. Unknown by many in today's Navy, there is a program that rewards Sailors who invent money-saving solutions for expensive procedures. It's called the beneficial suggestion program, otherwise known as "Benny Suggs."

AE2(AW) Dustin Nichter and AE2(AW) Ryan Gerber learned of this program while working in the Seahawks avionics shop during squadron work-ups for the 2007-2008 deployment.

The story of how these two electricians were rewarded financially begins just like any other day in the shop. They were handling aircraft discrepancies to keep the birds mission-ready. The initial discrepancy on aircraft 601, nicknamed "Big Sexy" by Seahawk maintenance, was an inoperative ground-lock solenoid in the landing gear. This part prevents operating the landing-gear handle when the aircraft is on the ground with weight on the wheels. The problem encountered by the aircrew once airborne was that the solenoid failed, and the gear handle wouldn't move to the up position. After the flight, maintenance faced another problem; the squadron was leaving for Fallon, Nev., in three days, as part of their work-up cycle. They couldn't afford to lose an aircraft. The solenoid needed to be changed quickly.

The squadron couldn't follow the normal replacement procedure. As per MIMS, the entire power-control pedestal had to be derigged and removed. This involved intershop coordination between airframe and powerplant mechs and typically would take about two days to complete. Afterwards, the entire pedestal would be sent to NADEP at NAS North Island in southern California to replace the inoperative part. The new pedestal then would be reinstalled into the aircraft after the squadron received it. On top of that, another day would be lost because a functional check flight was required after installing the part. This entire process usually takes about a week or two.

Faced with this dilemma, Petty Officer Nichter drew on his mechanical knowledge of the solenoid. He felt the avionics shop could change out the part successfully. He consulted with the maintenance master chief, AFCM(AW) Evans, and they came up with a possible solution. Nichter suggested removing a solenoid from a Titan aircraft hangared next door—one of several aircraft with expired airframes that can be stripped for useful parts before they are scrapped.

Nichter and Gerber could attempt the job, and if they failed, there would be no repercussions because the

aircraft already was down. Master Chief Evans trusted the competence of his avionics shop Sailors, so he pursued approval from the wing to perform maintenance procedures not in accordance with MIMS. In the meantime, he sent Nichter and Gerber over to start the job.

They pulled both multi-function-control display units, which allowed them access inside the control pedestal. The challenge they faced was limited vision on what they were doing; some of the work had to be done by feel alone. They jumped right into the task. With no need to derig or coordinate between shops to complete the job, they removed the part in less than an hour.

Once maintenance heard this news, it wasn't long before the master chief had approval from the VAW-126 CO, Cdr. Richard Wood, and the wing to perform a new maintenance procedure on aircraft 601. The solenoid removal and replacement went smoothly and was completed by the two electricians in three hours. The most difficult part of the job was figuring out how to attach the leads in a very limited work space. Their solution was to flip the solenoid upside-down, attach the wires, and then turn it over and screw it to the pedestal.

Afterwards, Nichter and Gerber waited for quality assurance to inspect the work and search for FOD. It looked good to them, so the airframers jacked the aircraft and performed a drop-check. This check was successful, and an FCF wasn't necessary because nothing was derigged in the pedestal.

Seahawk maintenance had overcome a standard, rigid practice that would not have been sufficient for a squadron doing work-ups. The true success was the creative thinking and implementation of an entirely new procedure. Shortly thereafter, Nichter and Gerber wrote the step-by-step, new procedure to help other Hawkeye squadrons faced with this same discrepancy. The squadron crunched the numbers to measure the overall success of the job after it was completed. The avionics folks came up with a total of 205 man-hours and nearly $60,000 saved by the Navy each time this new procedure was used.

When questioned, Gerber and Nichter both said they just were doing their jobs. Neither knew the "benny suggs" program even existed. They first learned of it when their avionics LCPO told them they might be eligible. They were surprised to learn they could suggest a change that would affect maintenance procedures for all Hawkeye squadrons. A lengthy delay ensued while the change submission was processed and reviewed by the wing leadership.

In fall 2007, the Seahawks departed Norfolk, embarked aboard USS *Harry S. Truman* for a seven-month deployment. As the priorities of deployment took over, the beneficial suggestion was put on the back burner. It still was being tracked, though, and when the command got word it had been approved, the Seahawks skipper called a command-wide quarters in the hangar bay.

The impromptu quarters caught Nichter and Gerber by surprise. In fact, Nichter, who was working nights, had to wake up early to attend. Gerber was participating in an Admiral's Cup volleyball game at the time, and Cdr. Wood told him just to attend in his PT gear. While both

Sailors had suspected a possible award for their work, they had no idea the kudos would be so substantial.

Quarters began with presentation of Navy Achievement Medals to both AEs for their professional knowledge and unconventional thinking when faced with a challenge. The only thing more unexpected than seeing a NAM being pinned to their chests was watching the commanding officer and avionics chief present them with a huge-sized check for $2,888!

The wing came up with the amount, based on their study of how much money the Navy would save each time they performed the new maintenance procedure in the future. They awarded 10 percent of the monetary value as reward for the maintainers' ingenuity. Nichter and Gerber split the reward money, and each deposited his half into the bank. As an added bonus, because they were deployed to the Persian Gulf, the entire reward was tax-free!

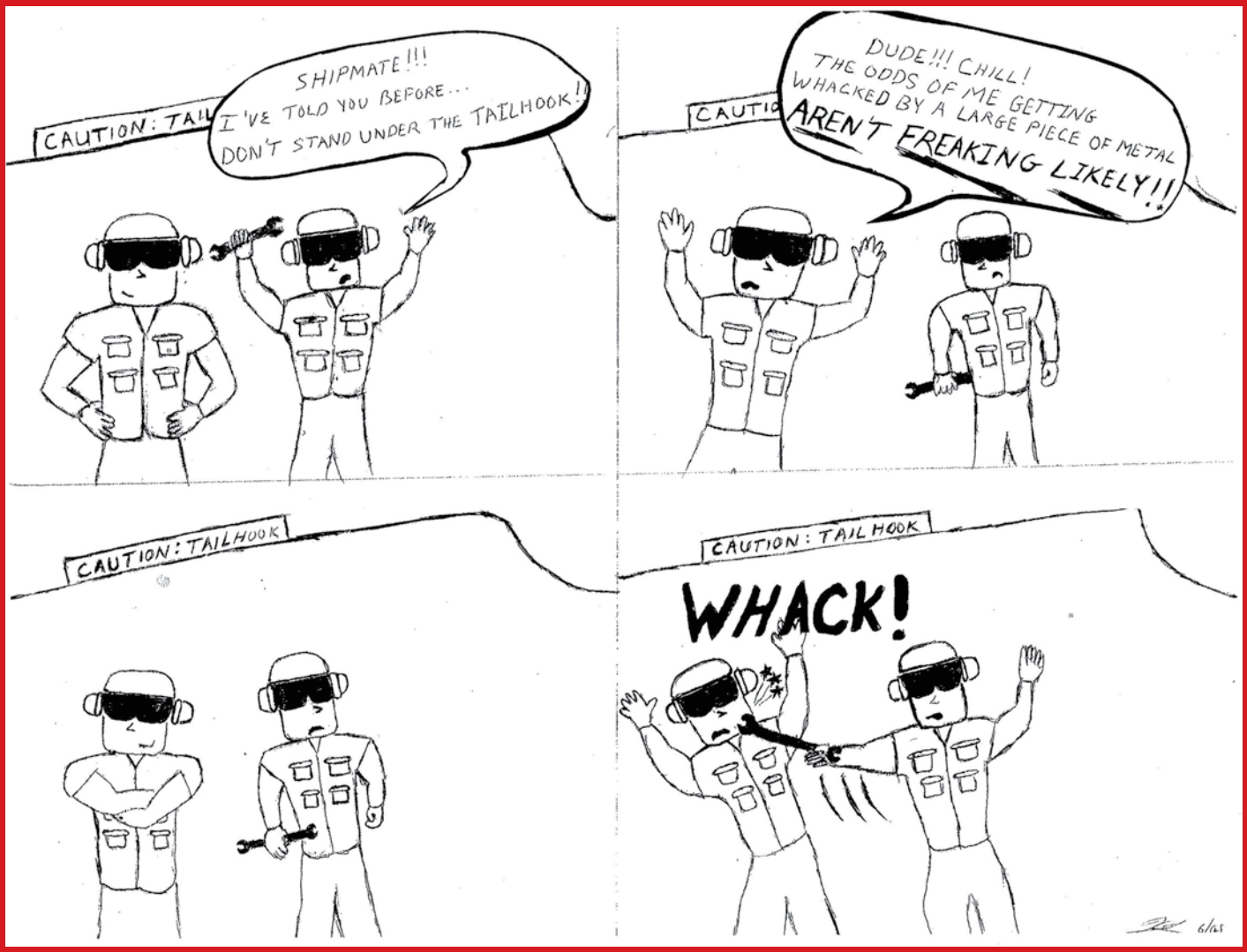
When asked what they learned throughout this process, Nichter responded, "Have confidence in your ideas. This showed junior personnel in the command that, if they have ideas on how to improve procedures, they should tell their chain of command. It could turn out to be successful and improve the way things are done." Gerber added, "It really improved awareness in the command, regarding programs like these. We've been answering many questions from command personnel and others about this program."

For personnel interested in this program, the details and requirements can be found in OPNAV 1650.8D, titled *Cash Awards for Military Personnel for Suggestions, Inventions, Scientific Achievements and Disclosures.*

Lt. Berg is the PAO at VAW-126.

Marines: See the following website for more information. http://www.logcom.usmc.mil/benesuggs/review.asp

Funnies From the Fleet



Cartoon by AT3 Joseph Longmore from VAQ-131

Maintainers *in the* Trenches

ABH2 Sabrina Bell gives the signal for takeoff as an MH-60S Knighthawk helicopter lifts off from USNS *Mercy's* (T-AH-19) flight deck during flight quarters. Navy photo by MC3 (SW/AW) Joshua Valcarel

AM3 Douglas Pistone tightens fasteners on an FA-18 strike fighter aboard the aircraft carrier USS *Theodore Roosevelt* (CVN 71). Navy photo by MC3 Jonathan Snyder

AD3 Anthony Blackner, left, and AD3 Ryan Fingall connect an air hose to the engine of an FA-18C strike fighter before conducting a systems test aboard the *Nimitz*-class aircraft carrier USS *John C. Stennis* (CVN 74). Navy photo by MC3 Bryan Ilyankoff

LCpl. Abraham Cortes, left, assigned to Marine Aviation Logistics Squadron (MALS) 11, and ADAN Jimmy Perez check electrical connectors and inspect engine leaks on the engine of an FA-18C aircraft aboard the *Nimitz*-class aircraft carrier USS *John C. Stennis* (CVN 74). Navy photo by MC3 Bryan Ilyankoff

Buzzwords

By AD1(AW) Craig Caffrey

As maintainers, we've all heard the call over the radio, "Preflight gripe on aircraft 329. Get out there and see what you can do." During a pilot-training flight, the flight engineer had pulled the prop-feather-control circuit breaker to simulate a prop failure to feather scenario on the No. 4 engine. When the engine is shut down with the emergency-shutdown handle, rpm should stabilize below 10 percent (mechanical feather). In this case, the flight engineer reported that the prop had stabilized at 11 percent. When Maintenance Control told me about the problem, I thought to myself, **"I've never seen this gripe before."** These buzzwords should raise eyebrows and awareness.

I'd been a mech in the P-3 community for less than two years. Since I had no experience with this gripe, I went to QA for direction. After talking with a senior first class with a great deal of P-3 experience, I said, "I've never done this before; can you give me some guidance?" His response was, "All you have to do is go out and make sure the rigging is within limits. If it is, then you can hard-card the mechanical feather at 11 percent in the aircraft-discrepancy log book." [Editor's note: IAW NAVAIR 01-75PAA 2-4 WP 005 00 NOTE. Anything below 13 percent for mechanical feather is within limits, once the rigging has been verified.]

With a B-4 stand in hand, a co-worker and I walked to the aircraft and removed the top propeller afterbody. We hooked the prop weight up to the top air-baffle assembly in order to simulate an in-flight condition. This is part of the procedure to check the engine rigging. In reality, I didn't even need to do this because I needed to check E-handle rigging. The procedure to check the engine rigging directs the maintainer to position the No. 1 prop blade at the 12 o'clock position and to pull the prop-feather-control circuit breaker in the flight station. At this point, I failed to do these steps because I was using the procedure for checking E-handle rigging. With the prop weight in place, I pulled the E-handle and

cringed as the weight nearly tore off the prop cuff. Despite referencing my checklist as required, I had combined two different procedures into one and, as a result, did both wrong.

Representatives from AIMD couldn't fix the cuff, and they recommended a prop replacement. Luckily, once the prop was removed and sent to AIMD, they were able to fix it and downgrade what easily could have been a Class-C mishap.

From my perspective, the aircrews in our squadron spend a lot of time discussing ORM and how it applies to their time in the air. The same principles that guide aircrew to safely execute a mission should govern how we operate as maintainers. If you can identify the potential hazards associated with a particular maintenance action, you can take steps to mitigate those risks. ORM should be more than a three-letter acronym on a poster in the mech shop.

The bottom line is: Don't get ahead of yourself. Go step-by-step, and don't mix up your work packages. If you ever hear someone say, **"I've never done that before,"** get involved with the process from start to finish and make sure you are training the person to do it the right way.

AD1 Caffrey works in the powerplants shop at VP-26.

VFA-211 Uses Deliberate ORM

By CWO5 Ron Stebbins

VFA-211 Checkmates at NAS Oceana use a model operational risk-management program in their maintenance department. The squadron uses *in-depth* ORM from CNAFINST 4790.2A and other governing directives, locally produced *deliberate* ORM briefs and checklists, and *time-critical* ORM at maintenance meetings.

VFA-211's program is a model for other squadrons because of how they create and use deliberate ORM briefs and checklists developed for high-risk maintenance evolutions. For example, the squadron has a binder in Maintenance Control where these briefs are available to all personnel. When a high-risk maintenance task is required, the maintenance chief uses the briefs and checklists to mitigate risk.

The Naval Safety Center's aviation-survey team observed the Checkmates' ORM application while squadron mechs were jacking an aircraft last summer. The work centers used a locally produced checklist that identified hazards with aircraft jacking, and they implemented the required mitigation actions for the identified risks. VFA-211 is clearly leading the way with aggressive mishap-reduction strategies that save lives and resources.

CWO5 Stebbins is the avionics/ALSS/analyst branch head at the Naval Safety Center.

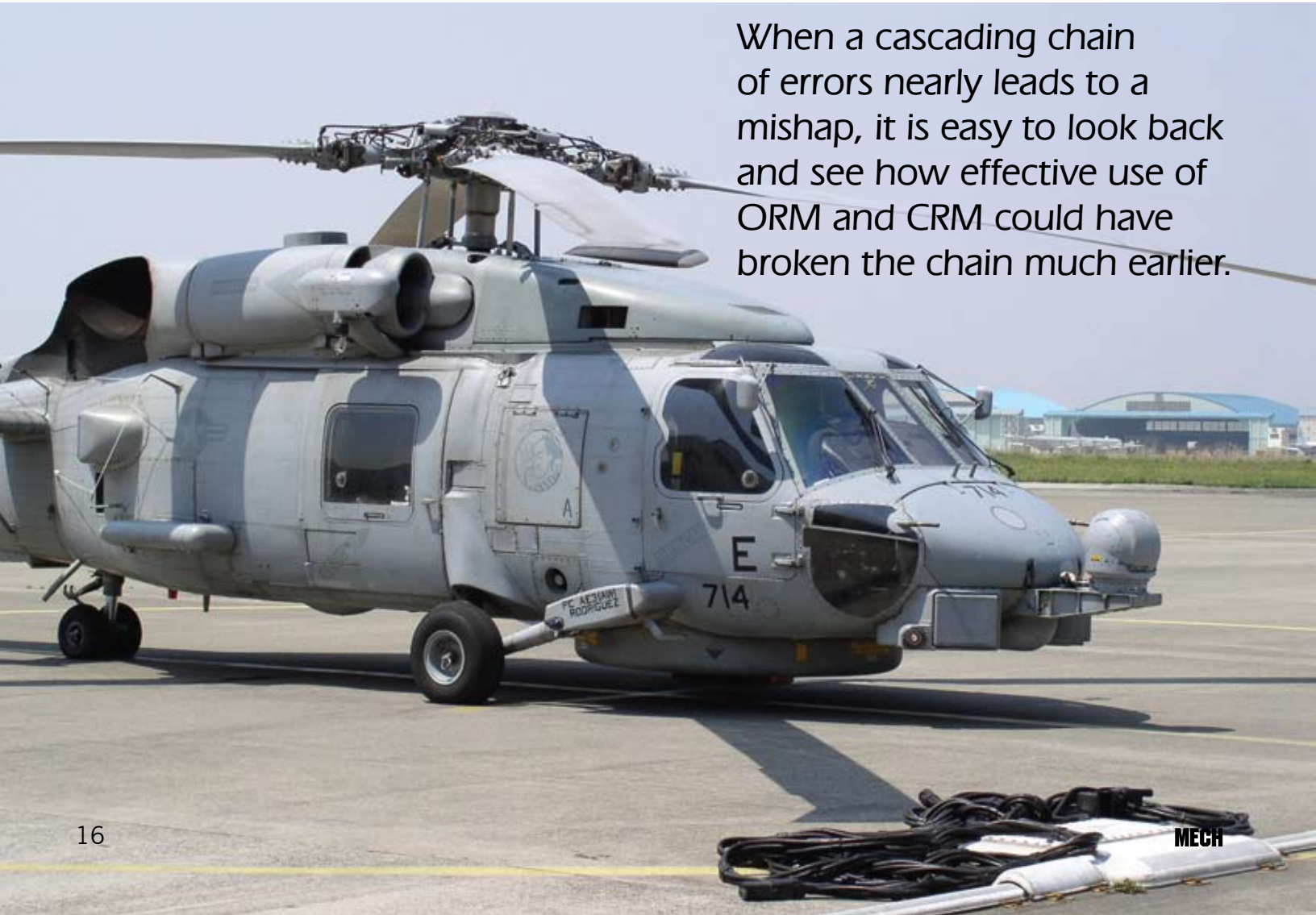
Will an H-60 Fly with Two Roll-Trim Servos?

By HSL-51 Public Affairs

Operational risk management and crew resource management have been two of the most successful tools used to address the growing trend in human factors-based mishaps in aviation. While these ideas have been less emphasized in the maintenance realm, they can provide the same benefits. When a cascading chain of errors nearly leads to a mishap, it is easy to look back and see how effective use of ORM and CRM could have broken the chain much earlier. This is a case-study in how poor risk management and breakdowns in communication and situational awareness led to a maintenance error that could have caused a mishap.

For the LAMPS community, challenging maintenance evolutions at sea, with limited personnel and equipment, are the standard. Cramped hangars, pitching decks, and a small number of maintainers are not obstacles for a first-class maintenance department. We excel in difficult situations. Unfortunately, complacency becomes the No. 1 enemy when "easier" maintenance tasks are done ashore.

In this case, a helicopter that had been flying in the pattern in Atsugi had a hydraulic malfunction while on deck on a short parallel taxiway used for pattern work. Recent wet weather and uneven surfaces prevented the aircraft from being towed back to the



When a cascading chain of errors nearly leads to a mishap, it is easy to look back and see how effective use of ORM and CRM could have broken the chain much earlier.

hangar for repair. Maintainers had to cross the flight line to troubleshoot the problem, which turned out to be a blown seal on the pitch-trim servo. These replacements happen often enough. No need to spend more time thinking about what to do; just order the part and fix it, right?

At this point, the first ORM questions should have been asked: "What is different about this job?" "What are the risks?" For one thing, the bird was stuck out on a remote spot, so simply walking across the airfield was out of the question. While the on-scene troubleshooters were held up at the aircraft, coordinating with base operations to cross the runway and taxiways, another set of maintainers put the part on order to expedite the repair. This resulted in a significant change from how parts typically are ordered. Normally, the technician who finds the faulty component orders it, since he or she knows exactly what part is broken.

In this case, calls concerning the part were relayed from the aircraft troubleshooters via hand-held radio to Maintenance Control. Word then verbally was passed to the airframes shop, where a technician broke out the correct publication to find the part number. Was the information lost in translation? Aggravating the problem, the publication had incomplete labels on the diagrams. The technician began confusing a pitch-trim servo with a roll-trim servo. The two components are nearly identical and only one step different during installation. The only visible difference is that one part has a grey cylinder called an "idler," where a piston should be.

The "What's different?" question could have been asked again here. The labels on the illustrations were incomplete, the procedures were ambiguous, and the component diagrams offered little help. As a result, a roll-trim-servo assembly was ordered, instead of a pitch-trim-servo assembly. By the time the wrong part had arrived, a shift turnover had occurred, and night check was on the job. Since the aircraft was in a remote location, and the component was to be turned in after the swap, there was no part to compare to the one received from supply at the time of acceptance. The serial numbers on the MAF matched the part, so the CDI signed and verified that the part ordered was the part that had arrived. Unfortunately, it was not verified as the right part for the job.

As the repair progressed, it started getting dark. The pad was unlit, so the maintainers were working with flashlights. Adding to the discomfort, it was 40 degrees, with light rain, and winds were gusting to 30 knots. Japanese Base Operations added to the pressure by calling several times asking us to expedite the repair since the helo was fouling the taxiway. In true can-do fashion, we replaced the part. Quality assurance verified the torques on the assembly, and the job was done. The work was signed off, and the aircraft was prepped with a daily and turn-around in the same challenging conditions. The extra idler and wrong assembly were missed again. Maintenance was finished, so it was up to the aircrew to complete the FCF. The next morning, the aircrew completed the FCF brief but then was distracted with a similar question: "How do we coordinate transport to the aircraft while complying with rules on transporting pyro in survival vests?"

With Hornets working the pattern just 150 feet away on the main runway, two functional-check pilots and an aircrewman completed the preflight on the parallel taxiway. Despite using standard FCF practices (all crew members pre-flighted the entire aircraft), no one recognized the extra idler and incorrect assembly. The aircraft completed the short FCF and was signed off as an up bird. (For trivia buffs out there, apparently an H-60 will indeed fly with two roll-trim servos installed.) The next day, supply called the squadron asking why we had turned in the wrong part. It was then we recognized the discrepancy. As the events were reconstructed, it became clear what had happened. The incorrect part was replaced, and the aircraft was FCFed again, with no damage done to anything but our egos. TPDRs were submitted for the pubs to clear up the ambiguities. We held a one-day maintenance and flight stand-down the next day to go over what had happened with all hands. We also addressed the complacency and communications issues head-on.

Most of you reading this now are asking the same question we were asking then: How on earth could something like this happen? The safety record of this squadron is outstanding. Some of our best maintainers and pilots were involved, but no one caught the error.

The next day, we convened a roundtable to assess where the process had broken down. Here is the list of factors:

An unfamiliar environment

Poor and distracting weather conditions

Pressure, both external and self-imposed, to get the job done quickly

Ambiguous reference materials

Communication breakdowns (from the shift change and using hand-held radios, instead of face-to-face contact)

Complacency at every level ("The last guy checked it and didn't say anything, so I don't expect to see a problem.")

Operational risk management would have prompted supervisors to start asking questions about this evolution. If they had, many of these factors would have been identified as sources of risk, and controls could have been put in place to mitigate them. Maybe the work could have been postponed until daylight. Maybe we could have tried to get a light cart out to the taxiway. Maybe someone from QA could have had an extra look, even if not specifically required. Maybe the old and new parts could have been compared side by side like they normally are.

Crew resource management generally applies to the dynamics that occur in the cockpit. But increased emphasis on some of the same principles—specifically communications, situational awareness, decision making, and leadership, could have broken this chain earlier, as well.

The author works at HSL-51 but chose to remain anonymous.

Good

Great message with an interesting approach.

Bad

What do you get when you store and use an electric-cart charger with a damaged equipment plug in an aircraft hangar by a water fountain in a high-traffic area?

If you're lucky, all you get is your picture in the BAD section of *Mech* magazine.

Ugly

Where is that eye wash station?

ORM for the Maintainer

Navy photo by MC2 Joseph Buliavac

By Ted Wirginis and Denis Komornik

We almost seamlessly maintain and repair aircraft and equipment all over the fleet, but did you ever wonder how we do this? Simply put, it's because we have very dedicated professionals doing their job. Whether we realize it or not, though, the success of those individuals who are just "doing their job" hinges upon thorough application of Operational Risk Management. Three levels are involved:

In depth, when our leadership and acquisition folks provide the equipment, training and guidance for maintenance actions

Deliberate, when we plan and brief for the events or operations of the day

Time critical, when we actually apply the risk controls or use the resources provided to us for getting the job done.

If you look back at the fall 2008 issue of *Mech*, you will see a familiar diagram (Figure 1) that shows the three levels in a shaded gradient, with no definitive lines between the levels. One level flows to next, dependent upon the time available, which obviously decreases as we get closer to the point of executing a maintenance action. We spend most of the time doing the job; that means managing risk and resources at the time-critical level.

Why is it important to understand the three levels of ORM? Because each level plays a role in improving our chance of completing the mission. In particular, the controls developed at each level are resources we can tap into to accomplish our job or mission during its execution. These resources make it easier to do our job and help catch errors that might interfere with the task or prevent mission success. Beyond the equipment itself and our fellow shipmates, there are other resources available to help mitigate risks associated with routine and expedited maintenance. These resources broadly can be

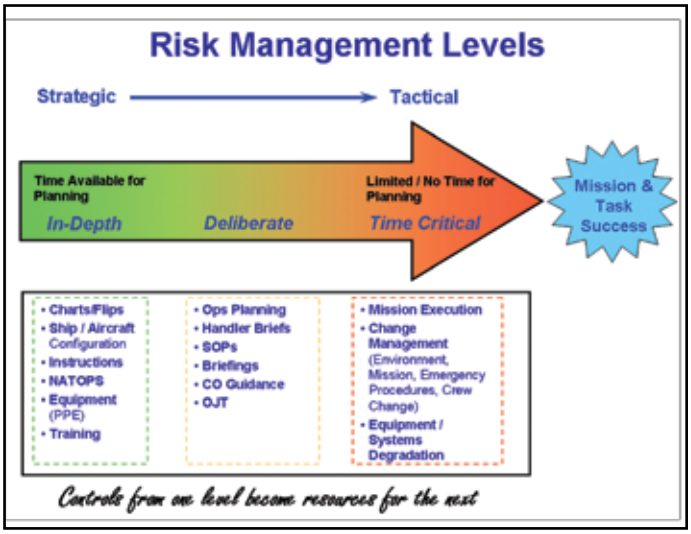


Figure 1

categorized into the following blocks:

- **Policies, procedures, and routines,** such as general orders, SOPs and guides. These resources speed up decision-making and increase predictability through standardized operations.
- **Checklists and job aids,** such as instructions and MIMs. These resources decrease potential for error and improve coordination.
- **Automation,** such as alarms, warning lights, and lock-out warnings. They alert us, help us interpret and process information more quickly, and help distribute the workload.
- **Briefings and external resources** transfer situational awareness from a supervisor, shipmate, briefer, or crew member. Briefs establish expectations and improve situational awareness.
- **Knowledge, skills and techniques,** such as training, practice and drills. These resources are brought by the individual to the task or mission. Besides helping us do a particular task, knowledge and skills improve situational awareness and ability to make informed decisions.

Figure 2

We can draw on these resources, created as controls, during the in-depth and deliberate levels of risk management to help us execute the task or mission at the time-critical level. Those in a leadership position are responsible to make sure the resources are available to maintainers who will be doing the tasks.

It is essential to continuously review available resources and make sure they are current, effective and relevant. This is a critical component of managing risk.

Don't think of ORM as an added program to do the job; it's an integral part of warfighting. We need to think, plan and perform better than our enemy to win or to succeed. We need to understand the threats and hazards we face—the things that stand in the way of successfully accomplishing our missions. We prepare to go into battle by developing tactics and procedures to counter our adversaries, and then we hone the skill necessary to execute them. We need to do our jobs, sometimes under extreme stress, and we need to do it as a team.

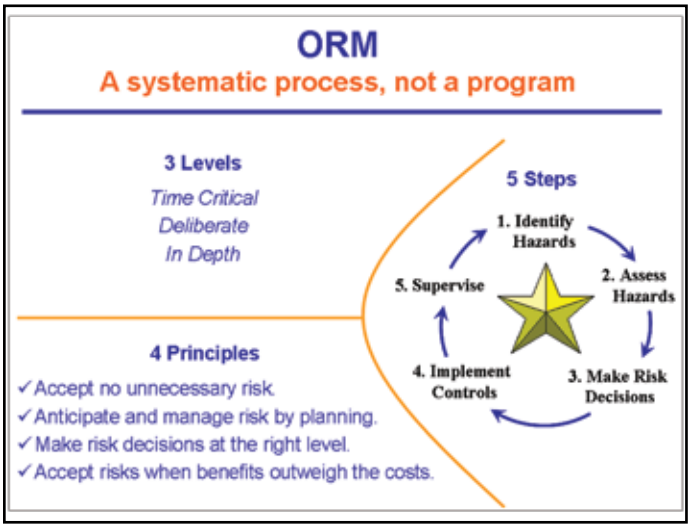


Figure 3

How does ORM fit into our daily lives when most of the time we're told what to do, when to do it, and that we'd better hurry up and do it? That's when we should apply time-critical risk management.

Recall the five-step process of ORM (Figure 3). This is the fundamental process used to anticipate hazards and to develop controls to mitigate the associated risks before doing the job. Time and experience has shown that it works exceptionally well for the in-depth and deliberate levels, but is a challenge, at best, to apply at the time-critical level. To help fill this time-critical gap, we have developed a new tool. You can read about it in the next issue of *Mech*.

Mr. Wirginis is the ORM manager and Mr. Komornik is the ORM training and education specialist at the Naval Safety Center.

PMA260 Aviation Support Equipment

By LCdr. John Ruane

The Naval Air Systems Command (NAVAIR) serves the Nation and the Navy by developing, acquiring, and supporting naval aeronautical and related technology systems.

PMA260 is a program-management office in Air 1.0, which, led by Capt. Mike Belcher, procures and provides life-cycle support for all common support equipment used by each type-model-series aircraft throughout the Navy and Marine Corps. This inventory encompasses more than 2,500 line items of support equipment. PMA260 currently manages more than 50 designated acquisition programs including the consolidated automated support system (CASS) (Navy) and RTCASS (Marine Corps). More than 60 military, federal and contractor personnel work at NAVAIR headquarters in Patuxent River, Md., while the rest of the PMA260 team works at six other sites throughout the country.

PMA260's mission is to provide cost-effective, aviation-common support equipment for fleet operations and maintenance activities. They also fund requirements for replenishing peculiar support equipment (PSE) for out-of-production weapon systems. The scope of their mission includes 157 funded programs across the 5 year budget with 124 current contracts in place. These contracts cover modernizing CASS; procuring new hydraulic power-supply systems and a new land-based, mid-range tow tractor; and developing 45 abbreviated acquisition programs.

PMA260's additional responsibilities include:

- Providing support-equipment leadership for the naval-aviation enterprise
- Serving as DoD Executive directorate for automatic test systems

- Serving as a member of the joint panel for aviation-support equipment (JPAVSE) committee, aviation common systems (ACS) committee, and joint aeronautical logistics commanders (JALC)
- Managing AUTOSERD and SERMIS, which includes all SE and IMRL gear
- Being designated as a USD(AT&L) reduction of total ownership cost (RTOC) special interest program

They support the fleet, providing the tools needed to fix, service, arm, and handle aircraft. In other words, PMA260 provides every type of ground support necessary to meet requirements of the daily flight schedule

of fleet aircraft squadrons. Today, they provide sustainment, logistic support, and training for support equipment. Their mid-term priorities focus on replacing aged and obsolete gear that is no longer serviceable, and they have modernization road maps for where they are going. Long-term plans include a fleet-prioritization process that identifies equipment for future replacement.

All their programs go through a rigorous acquisition cycle. Everything is tested environmentally (shock, vibration, EMI) to make sure the gear will function safely in the harsh environments in which fleet Sailors and Marines operate. PMA260 is reducing the support-equipment footprint throughout the fleet by combining multiple testers, which reduces inventory, maintenance, and calibration requirements. Reduction of maintenance requirements directly affects the safety of Sailors and Marines by reducing their already busy workload.

PMA260's efforts are not only saving taxpayer dollars; they are making maintenance work environments safer, easier, and better. Their program office has made cost reductions through reliability-centered maintenance efforts (monitoring trends and adjusting their process to reduce man-power requirements and maintenance-documentation processes). One example of cost savings through reduced footprint is seen with the O-level weapons release-and-control test sets. They are replacing nine different testers with only one. Over the years, different platforms have bought their own individual testers, which led to increased maintenance, training, and manpower requirements.

Captain Belcher thinks it's important for the fleet to know what PMA260 is doing for them and to understand that the gear being fielded to them has been put through a rigorous acquisition cycle. This cycle includes design reviews, environmental testing, and a thorough test and evaluation of all the logistic elements. PMA260 makes sure that your support equipment works properly and that it's supportable.

PMA260's logo states, "There is no air support without ground support." They are committed to modernizing common support equipment, including CASS, obsolescence, making common support equipment (CSE) better for the operator, removing legacy automatic test equipment (ATE) and CSE, and reducing the amount of CSE needed in the fleet. See a video and find out more about PMA260 and how they are working to help Sailors today, in the near-term, and the long-term, by visiting our website at www.safetycenter.navy.mil. Also, look for future articles in the Air-Wing toolbox section of *Mech*.

LCdr. Ruane is the strategic planning division head and Mech *magazine editor at the Naval Safety Center.*

Flight, Flight-Related, and Ground Class A and B Mishaps 9/12/2008 to 12/08/2008

Class A Mishaps

Date	Type Aircraft	Command
09/15/2008	AH-1W	HMLA-269

Aircraft crashed in desert during weapons delivery.

10/04/2008	FA-18F	VFA-103 (was VF-103)

Superhornet struck flight-deck director during cat stroke resulting in fatality.

10/04/2008	HH-60H	HSC-84

Dash 2 hit dash 1 while landing at night on goggles.

10/20/2008	OH-58C	NAVTESTPILOTSCH

Aircraft rolled over and was destroyed.

10/20/2008	P-3C	VPU-1

Orion departed the runway after landing.

10/27/2008	MH-60R	HSM-71

Sonar transducer separated from aircraft while dipping. No injuries.

12/08/2008	FA-18D	VMFAT-101

Hornet crashed on final to homefield. Pilot ejected. Injury-TBD.

Class B Mishaps

Date	Type Aircraft	Command
09/16/2008	T-45A	COMTRAWING 2

Goshawk engine FODed during high-power maintenance turn. No injuries.

09/24/2008	FA-18E	VFA-122

Starboard engine FODed during night ops resulting in engine flameout.

10/25/2008	AV-8B	HMM-264

Leading edge root extension separated from aircraft. No injuries.

11/09/2008	MH-60S	HSC-8

Tip caps impacted tail boom while on night-training flight.

11/11/2008	SH-60F	HS-14

Cable departed sonar reeling machine. Transducer lost at sea.

11/13/2008	TH-57B	HT-8

Aircraft rolled over while practicing full autorotation. No injuries.

11/14/2008	E-2C+	VAW-77

Hawkeye departed taxiway after brake failure during landing.

11/17/2008	EA-18G	VX-9

Port engine fire during flight.

11/21/2008	UH-1Y	VX-31

No 2 engine drove main rotor and No. 1 engine to exceed limits. No injuries.

12/03/2008	T-45C	VT-22

Engine overspeed during run up for takeoff. No injuries.

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Naval Safety Center Data
Cdr. Paul Bunnell
For questions or comments, call LCdr. John Ruane
(757) 444-3520 Ext. 7220 (DSN 564)

Sailors and Marines Preventing Mishaps

BRAVO Zulu

Send BZs to: SAFE-Mech@navy.mil

BZ of the Quarter

AM1(AW) John Baumgartner
VAW-126

During an E-2C low-power engine turn on USS *Harry S. Truman* (CVN-75), Petty Officer Baumgartner noticed a tractor driver moving an F/A-18F inside the E-2C safety chain. Initially, another petty officer in the Hawkeye safety chain told the tractor driver to stop. That petty officer turned his attention back to his duties in the safety chain and subsequently felt the tractor push against him and through the safety chain. Petty Officer Baumgartner immediately intervened and stopped the flight-deck petty officer from moving the Super Hornet any farther.

When the F/A-18F stopped, its nose was within two feet of the turning E-2C propeller. Petty Officer Baumgartner's quick actions narrowly averted a mishap which could easily have injured or killed a number of Sailors.

Cpl. Philip Moores
VMM-162

During a 35-hour inspection on Yankee Sierra 05, Cpl. Moores found small metal shavings near the prop-rotor gearbox. Realizing something was wrong, he meticulously searched for the source of the shavings. He found a deep, inch-long groove in the non-rotating ring of the swashplate. The groove was caused by a bolt from the gimbal ring, which had come loose, damaged the swashplate, and subsequently broke in half.

If Cpl. Moores had not detected this failure, the swashplate likely would have failed during subsequent flights.

AM2 Eugene Estella
CMO-2 MDT B

Petty Officer Estella was turning the elevator-trim wheel on a P-3 aircraft when he felt some resistance. Upon reaching the stop, he began rotating the trim wheel in the opposite direction and still felt a slight bind. He went inside to notify QA.

A visual inspection inside the rear empennage revealed a snapped elevator cable; the other cable was bunched up and tangled around the cable drum. These problems could have caused the flight controls to fail.

AT2(AW) Gregory Domme
VFA-94

During a cross-country recovery, Petty Officer Domme noticed a shimmer of light coming from aircraft 465's right main tire. A metal object was embedded in the tire, and he immediately notified Maintenance Control for assistance.

After deflating the damaged tire, he removed the object: a half-inch rivet. The limit for any wear or damage to this particular tire is 3/8-inch.

AT3 Patrick Larivee
HSL-44

After completing daily and turnaround inspections on an SH-60B aboard USS *McInerney* (FFG-8), Petty Officer Larivee noticed black fluid leaking from the starboard main-landing-gear strut on another helicopter, Magnum 455. He immediately asked for help from an AM CDQAR.

Further inspection revealed a dissolved seal in the strut. Petty Officer Larivee's attention to detail and assertiveness prevented the failure of the strut during shipboard landings.

AE2 Christopher Kilbourne
HSL-49

While embarked aboard USS *Thach* (FFG-43), Petty Officer Kilbourne went beyond his normal job responsibilities by discovering a hazard and taking positive steps to rectify it. A detachment aircraft had a complete failure of all heading, navigation and attitude instruments over the flight deck. This failure was caused by a newly incorporated compass system, for which there was no guidance in the maintenance manuals. Despite a lack of technical data, Petty Officer Kilbourne creatively scrutinized every component in the system for a possible cause. Eventually, the discrepancy cleared itself, with no maintenance action.

Petty Officer Kilbourne was not satisfied with an unverified corrective action. He realized the potential for a catastrophic incident this discrepancy could cause if it reappeared. He refused to recommend the aircraft as safe-for-flight until a known cause could be identified and corrected. His efforts were the first step in identifying a community-wide deficiency in the H-60B/F/H's replacement attitude and heading-reference system.

AM3 Allen Gibson
VFA-94

After repairing aircraft 400's inertial navigation system during a rescue detachment, Petty Officer Gibson noticed the left nose tire appeared to have significantly less pressure than the right nose tire. He immediately contacted Maintenance Control and helped coordinate the acquisition of a new set of tires.

Closer inspection revealed the tire had deflated, and the bead had broken away from the wheel. Petty Officer Gibson prevented a catastrophic blow-out of the nose-landing-gear tire.

AD2 Evens Pierre-Paul
HSL-40

While supervising the drainage of an aircraft fuel sample on an SH-60B, Petty Officer Pierre-Paul noticed a major fuel leak on the aircraft. He immediately directed a fuel-spill team on scene and simultaneously put himself under the leak to secure a faulty fuel-sump valve.

Petty Officer Pierre-Paul's attention to detail and quick reactions avoided a potentially dangerous situation. Through proper procedures and a take-charge attitude, he was able to stop and contain the leak before any harm came to the environment or the aircraft.

AM3 Brandon Hood
HSL-49

During a countermeasures washdown of the O-2 level aboard USS *McClusky* (FFG-41), Petty Officer Hood noticed water leaking onto a helicopter. Saltwater had infiltrated the hatch above the port helicopter hangar, and Hood immediately made the call to terminate the wash.

The detachment maintainers limited the saltwater exposure with an immediate fresh-water washdown. Without Petty Officer Hood's actions, the aircraft would have had severe salt-water damage.

AE2(AW) Marshall Minot
HSL-51 Det.4

While acting as flight-deck director, Petty Officer Minot recognized an unannounced ship turn during a helicopter move—a dangerous situation. He made a verbal call and hand signal to chock and chain the aircraft. His instinctive and assertive order for chocks and chains likely saved both the brake rider and helicopter, which might have rolled over on the tilted flight deck during a sharp turn.

AM2 Jocelyn Joseph
HSL-51

During corrosion-prevention work at sea on Black Beard 01, Petty Officer Joseph noticed a series of cracks in the secondary collective servo. The cracks were in an inconspicuous area of the SH-60F's hydraulic bay. After informing Maintenance Control, resulting in downing the aircraft, he helped replace the component and saw it through the FCF a day later. His attentiveness to the job prevented a catastrophic failure of the servo.

AT2(AW) Jurgen Vasquez
HSL-51

Petty Officer Vasquez was the fire guard and chock runner for Warlord 717. While standing on the port side of the aircraft, waiting for the signal to pull chocks, he noticed movement near the tail cone. He went to the starboard side of the helicopter and saw both tail-drive-shaft covers were unfastened. He told the plane captain, who signaled the pilots to shut down. Petty Officer Vasquez's quick reaction and attention to detail prevented a hazardous situation from developing.

AM1(AW) Jason Grisso
VAW-126

While preparing a Hawkeye aircraft for aircrew man-up, Petty Officer Grisso noticed slight differences on the starboard mainmount tire. Looking at the tire sidewall more closely, he saw different size, ply and cut parameters than what he had seen the last eight years of working on C-2 and E-2 aircraft. He subsequently compared sidewall ply ratings with that of the port mainmount tire and confirmed his suspicion of the incorrect tire mount. He radioed Maintenance Control for further corrective action.

AM3 Ivan Kennedy
VAQ-137

While serving as a flight-line troubleshooter, Petty Officer Kennedy spotted a hydraulic leak in the left wheelwell. Further investigation revealed a cracked hydraulic line in the landing-gear system. He immediately notified the QA representative for the launch and downed the aircraft.

Had this discrepancy gone unnoticed, the aircraft could have experienced a catastrophic hydraulic leak while airborne.

AD2 Charlie Tran
HSL-49 Det. 4

Petty Officer Tran found a two-inch gouge on the trailing edge of an aircraft's tail-rotor paddle during a post-flight tail-pylon folding. Further investigation revealed that the tail-rotor de-ice harness had detached from the paddle, struck the tail-rotor blade, and caused significant damage. He immediately notified his chain of command and single-handedly removed and replaced the tail-rotor paddle. He also took the initiative to inspect the other detachment aircraft and discovered damage to their harnesses.

Petty Officer Tran identified a major hazard, prevented a possible mishap, and his actions resulted in a fully mission-capable aircraft within 24 hours.

AD3 Eddie Ramos
HSL-49

Petty Officer Ramos noticed white-powder corrosion protruding from sealant on the accessory module of Red Stinger 103. Considering the critical functions of the accessory module and magnesium's high susceptibility to rapid corrosion, he removed the remainder of the potting compound.

Further inspection revealed severe pitting in multiple areas on the accessory module—a major hazard.

Shingo Silver Medallion Awards

By Jim Markle

Naval Aviation Maintenance is silver across the board. Proudly displaying their Shingo Silver Medallion awards (from left to right), Capt. Timothy S. Matthews, Commanding Officer Fleet Readiness Center Southeast; Col. David A. Smith, Commanding Officer Fleet Readiness Center East; Capt. Michael Kelly, Commanding Officer Fleet Readiness Center Southwest; and RDML Paul A. Grosklags, Commander Fleet Readiness Centers pose after the fourth annual public sector Shingo Prize award ceremony held at the Crystal Gateway Marriot in Washington, D.C. on Thursday, Oct. 9, 2008. The Shingo awards were established in 1988 to promote awareness of lean manufacturing concepts and recognize organizations that achieve world-class manufacturing status. There are three award levels: The Shingo Prize, Silver Medallion, and Bronze Medallion. Only four public sector organizations across the U.S. received Silver Medallions, and three of those were FRCs.

Mr. Markle is a public affairs specialist at Fleet Readiness Center Southwest.

Photo by Steve Fiebing

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Egress/Environmental Systems

Things That Go Boom Can Be Fatal

By AMEC(AW) Eric Wickham

Problem: Egress and ALSS-related ordnance stored in work centers longer than the allowable timeframe can create a dangerous and possibly fatal work environment. Recent surveys revealed a trend of ordnance not being transferred from a work center to an RSL when not immediately needed for maintenance. The chance of injury is greatly increased in the event of a fire in maintenance spaces.

Solution: We are responsible for our personnel's safety at all times. It is imperative that we follow the guidelines and procedures set forth in our ordnance-handling manuals. NAVSEA OP 5 para.11-6.3 outlines the storage facility and timeline requirements for work-center temporary storage.

Best Practices: Work centers that are vigilant in their housekeeping tend to be more vigilant in safety and related programs. Take some time and look around your respective work centers. You may be surprised what you find in that box that has been sitting in the corner since before you checked in. Commands that are doing this right include VFA-136, VAQ-129 and CMO-10.

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

Don't Let Your Eyewash Station Become an Eyesore

By AMCS(AW) Robert Chenard

Problem: Some commands are not maintaining eyewash stations. These survey photos show blocked, dirty, and poorly placed eyewash stations.

Solution: Two CSEC questions (with references) are relevant:

- Do your eyewash stations meet all safety requirements? Ref: COMNAVAIRFORINST 4790.2A, Chap7, para.7.1.8.2.1; OPNAVINST 5100.19E, Vol.1, Part 1, B0508 a through g; OPNAVINST 5100.23G, para.1902a and ANSI Z358.1
- Are your eyewash stations periodically activated and functionally tested in accordance with the required periodic maintenance? Ref: COMNAVAIRFORINST 4790.2A, Chap 7, para.7.1.8.2.1; OPNAVINST 5100.19E, Vol.1, Part 2, B0508.a(10); OPNAVINST 5100.23G, para.1902a

OPNAVINST 5100.23G states, in part, that "All such emergency facilities shall be located where they are easily accessible to those in need. Work centers shall activate plumbed eyewash units weekly for a period long enough to verify operation and flush the line. Inspection and maintenance tags should be placed on self-contained eyewash units to document most current inspection/maintenance. Periodic maintenance shall include cleaning of the unit, replacement of water (depending on manufacturer's recommendation), and checking for proper operation."

Water flows onto electrically hard-wired fire alarms

Look at the picture with the debris on the eyepiece again. That is bird excrement! Would you want to have that flowing into your own eye if you needed to use the eyewash?

Blocked by trip hazards

Dirty with bird excrement

Best Practice: Make all hands responsible for these emergency devices. Don't just leave it for the safety petty officer! If you see something wrong with an eyewash station, tell Maintenance Control. If it only needs cleaning, do it. You may be the one who needs it next!

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

Tool-Control Trends and Analysis for 2008 Show Deficiencies

By MSgt. Michael Austin

Problem: Most squadrons surveyed in 2008 had deficiencies in tool-control practices and procedures, specifically:

- Incomplete signatures and documentation on the required forms
- Inconsistency between QA's missing/broken/worn control-numbers log and the final source documentation maintained by the tool-control manager (TCM) in the tool room
- The QA's logbook for tool-control-assignment numbers often were left blank for final disposition of the report.

Solutions: COMNAVAIRFORINST 4790.2A, Chap 10.12.3.9 states that the program monitor shall:

- Conduct missing-tool investigations and annotate findings on the Missing/Broken/Worn Tool Report or FRC equivalent form.
- Keep a log to assign a report number to each Missing/Broken/Worn Tool Report. A sequential numbering system shall be used and consist of year, type of report, and serial number, for example, 95-M001 (M = missing), 95-B002 (B = broken), or 95-W003 (W = worn). The logbook must contain: report number, calendar date, initiated by, work center, tool box/item number, nomenclature, investigator assigned, and final disposition.

COMNAVAIRFORINST 4790.2A Chap 10.12.4.3, O-level and "IMA Missing Tool Procedures" state:

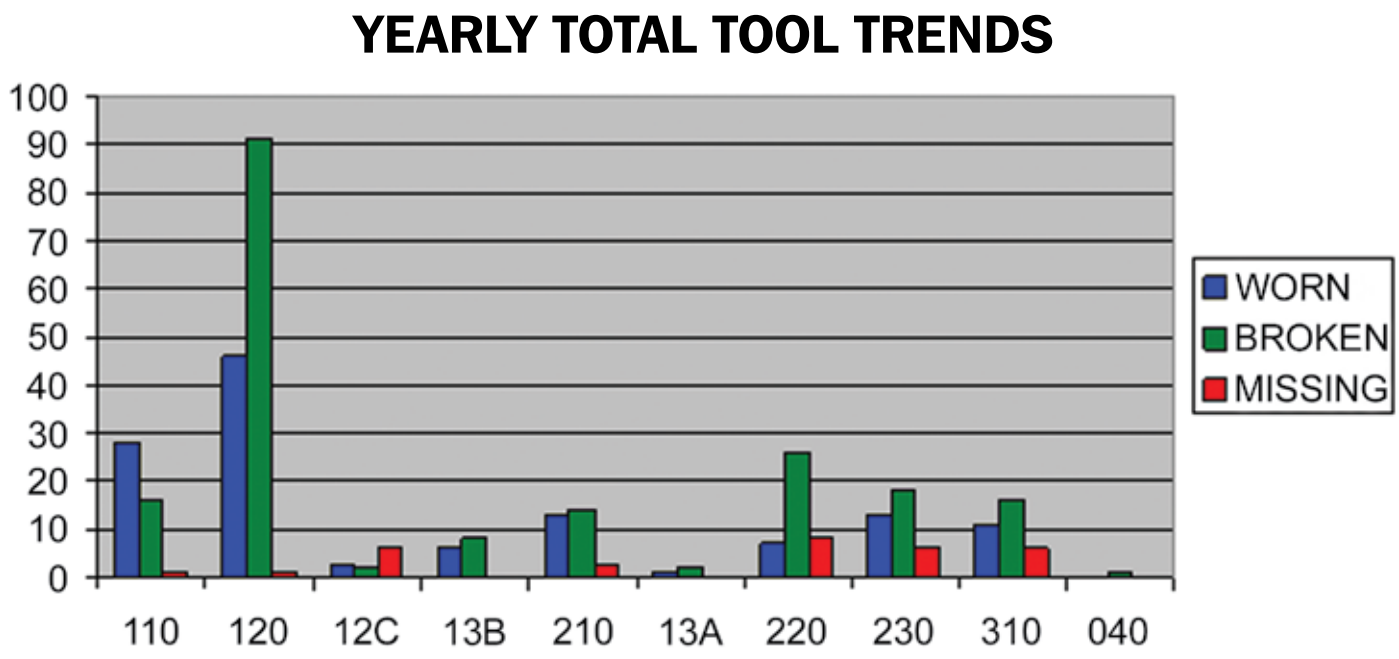
- The work center immediately notifies Maintenance Control or Production Control of a missing tool and conducts a thorough search of the work area(s), using and filling out the Missing/Broken/Worn Tool Reports in their entirety.

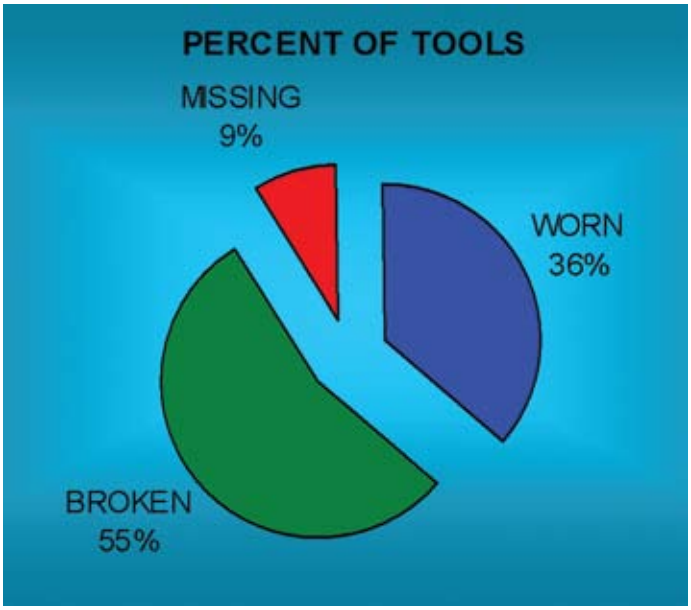
Note that you must treat a broken tool with missing pieces as a missing tool.

COMNAVAIRFORINST 4790.2A, Chap 10.12.3.2 states that the MO/FRC Equivalent shall:

- Not release aircraft/equipment for flight/operation, in the event a tool or part of a tool is missing and not recovered, until an investigation is conducted to confirm the tool/tool part is not in the aircraft/equipment. O-level and FRC activities will use the Missing/Broken/Worn Tool Report or an equivalent FRC form. During the absence of the MO/FRC equivalent officer, the AMO/FRC equivalent shall perform this function.

Best Practice: The best practice is having an





experienced tool-control monitor or QA representative accompany the work center or division during the entire process of the Missing/Broken/Worn Report and investigation. They should make sure the enclosures from COMNAVAIRFORINST 4790.2A, figures 10.12-1 and 10.12-2, are completed. This process ensures that the TCM and QA have the same corresponding documentation, and follow-up can be annotated for final disposition. The investigative process and information from the accurate BTR log can be used in trend analysis, allowing the unit to identify areas for specific training or special audits.

VFA-37 received a Bravo Zulu recently because they used a computerized tool-control analysis chart. Using this month-by-month tool-trend chart is a progressive and proactive approach to identify trends and training needs for the tool-control program.

Master Sergeant Austin is a maintenance analyst at the Naval Safety Center.

Avionics

New Requirements and Tools for Aircraft Wiring

By AEC(AW) James Esslinger

Problem: Many squadrons and I-levels are unaware of new requirements and tools associated with aircraft wiring.

Solutions: Two very important new acronyms that every AE and AT should know are JSWAG (joint-service wiring action group-formerly known as NAVWAG) and WAIT (wiring awareness inspection techniques).

JSWAG is a branch of the Propulsion and Power Engineering Department at NAVAIR. Their website is http://www.navair.navy.mil/jswag/. The annual JSWAG conference was held in early November. Expect next year's conference to take place around the same time of the year and most likely in the same location (Virginia Beach). The JSWAG conference is a great venue to find out actions that already are in place to better the aircraft-wiring environment. It also is a great place to submit new action chits for the team to assist in resolving your concerns or needs. Here are some recent items:

- Zipties no longer authorized for use on military aircraft. This rule already has been placed in the 505 manual.
- Hinged-type cushion clamps authorized for use as suitable replacements for the original harness-installation clamps.
- New tools have been authorized for use, such as the Infra-Red heat gun.

WAIT training is a coordinated effort to help the avionics technician better understand how to inspect for, identify and repair wiring discrepancies before they become an issue. This is great initial hands-on training, as well as excellent refresher training for all electricians. All the information you need to request this training is available on the JSWAG website.

Best Practices: If you are an AE or AT supervisor or the LPO of your work center, you actively should be involved with this group. Every aircraft, whether new or 20 years old, has wiring issues. If you neglect them by not inspecting, you're putting people at risk.

The NA 01-1A-505 manuals have been updated a few times in recent years and have been consolidated into four manuals. You can expect regular updates, and a fresh revision should be available by September 2009.

More leaders of the wiring and electrician community should attend these conferences. The turnouts are good, but the greater our stretch, the better we can effect change in instilling proper aircraft-wiring techniques for military aircraft today.

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

Class C Mishap Summary

By MSgt. Michael Austin

From Sept. 20, 2008, to Dec. 9, 2008, the Navy and Marine Corps had 20 Class-C mishaps involving aircraft.

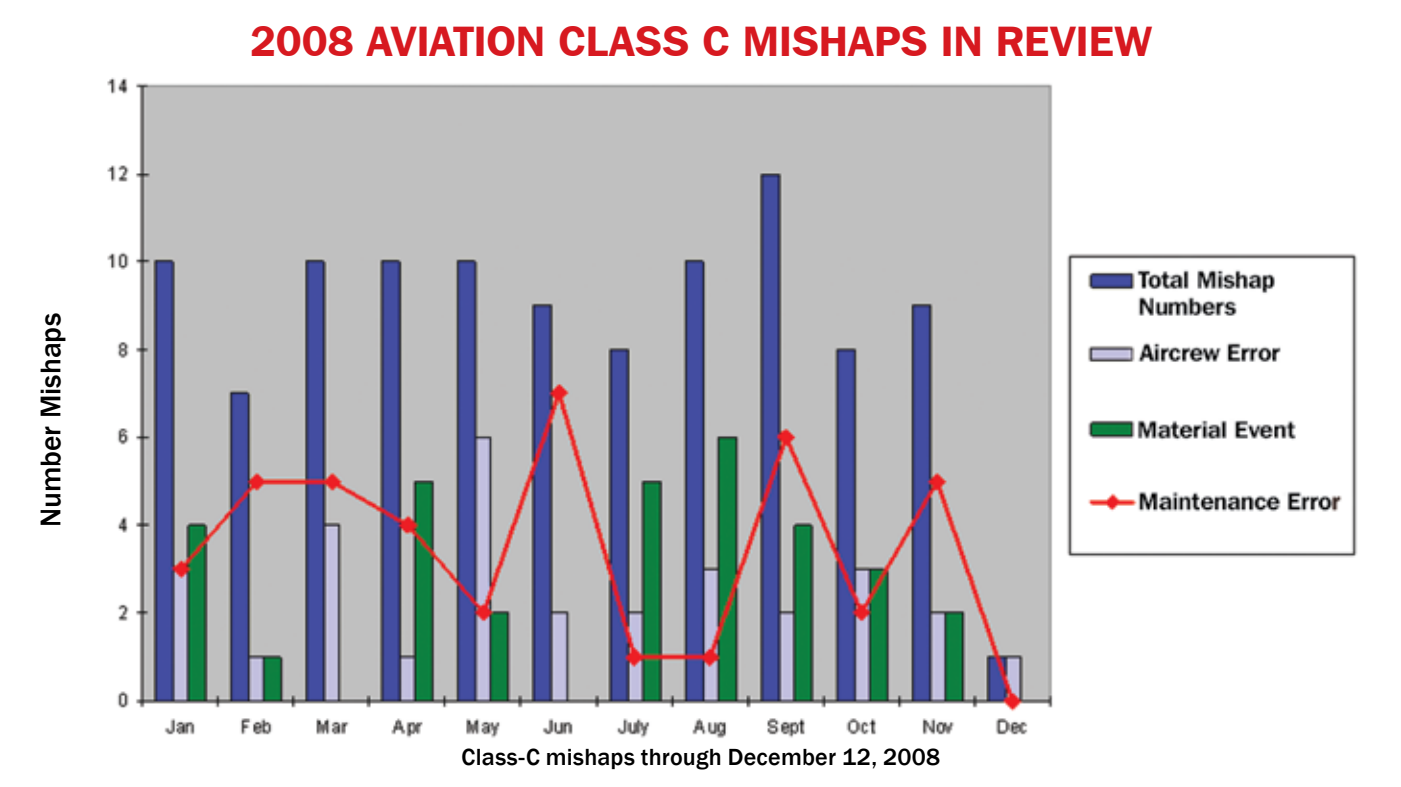
After reviewing several Class C mishaps and initial investigations, one common, major theme stood out in all these incidents. That theme is "situational awareness," commonly referred to by most aircrew and pilots as SA. Maintainers and ground-crew coordinators not using good SA with respect to their location usually miss key factors in the chain of events leading up to a mishap. Here are some recent mishaps that could have been avoided if good SA had been used:

• Two maintainers had to repair an aircraft's onboard oxygen generating system (OBOGS). The experienced maintainer briefly left the other maintainer unattended during removal of the oxygen monitor. After removing the OBOGS component, the junior maintainer closed the aircraft canopy. He did not notice the cannon plug and wiring still was under the left side of the canopy sill. The lack of SA and maintainer supervision resulted in damage to the canopy and OBOGS.

• An FA-18A ingested a cranial into the No. 2 engine during a maintenance turn. There were many causal factors associated with this mishap. The first were poor communication and lack of assets. The plane captain did not effectively supervise the event and did not relay vital information. Only the No. 1 engine was supposed to be turned at 80 percent to troubleshoot the problematic subsystem. Only one protective-intake screen was available and installed. The No. 2 engine screen was NRFI and not installed. Only four maintainers were present during the maintenance turn, and they lacked supervisors for coordination and proper placement of personnel. The lack of communication, safety barriers, and situational awareness, coupled with the placement and running both engines to 80 percent instead of one, resulted in one maintainer's cranial being pulled off his head and ingested into the No. 2 engine. This situation shows that any step in the chain of events could have been avoided if just one of the maintainers had used SA and followed standardized practices and procedures.

During 2008, there were 41 Class-C maintenance-related mishaps. After detailed investigations and analysis of these events, the primary causal factors were lack of supervision, procedures not followed, poor judgment, and lack of situational awareness. The total monetary cost from these mishaps ranged from $820,000 to $ 4,100,000, based on severity.

The accompanying graph depicts 103 events of submitted Class C mishaps. The areas included are: aircrew error, material events, and maintenance error.



Master Sargeant Austin is a maintenance analyst at the Naval Safety Center and coordinator of the Crossfeed 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 October-December.

Safety Surveys

October:	November:	December:
VFA-136	HMM-764	VFA-204
HSC-26	VX-31	VR-54
HSC-28	VX-9	HMLA-773
HMH-366	VMU-3	FRC W/MALS-41
HMLA-467	VQ-3	VMFA-112
VFA-105	VQ-4	VMGR-234
VFA-37	VQ-7	

MRMs

AMO School: Whiting Field, FL
VFA-32: NAS Oceana
HSC-28: NS Norfolk
VAW-121: NS Norfolk
VFA-136: NAS Oceana

Culture Workshops

VP-1
VP-69
HT-18
HS-6
VMFA (AW)-224
FRC-MA (Patuxent River, MD)
TACRON-12
HSC-3
HSL-37
VP-47
FRC-SE (Jacksonville, FL)
ETD Pacific (HI)
HSL-46
VPU-2
VMFA-314
VFA-154
HT-8
FRC-MA (New Orleans, LA)
HSC-8
HMLA-773 Det B (PA)
VFA-106

For more information or to get on the schedule, please contact: Safety Surveys: Maj. Anthony Frost, USMC at 757-444-3520 Ext. 7223, MRM: AMCS(AW) Robert Chenard at 757-444-3520 Ext. 7221, Culture Workshop: Cdr. Duke Dietz at 757-444-3520 Ext. 7212.


Why Manage Risk?
Here Are Two Reasons
Navy photo by MC1 Bruce McVicar
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