The Navy & Marine Corps Aviation Maintenance Safety Magazine

Mech

Summer 2015

www.public.navy.mil/comnavsafecen/

Night Flight Deck Maintenance

3 Points of Contact

Fall Protection Pullout

The Navy & Marine Corps
Aviation Maintenance Safety Magazine
Summer 2015, Volume 53 No. 1

RDML Christopher J. Murray, Commander, Naval Safety Center
Col Glen Butler, USMC, Deputy Commander
CMDCM(AW/SW) Paul Kingsbury, Command Master Chief
Margret Menzies, Head, Media and Public Affairs Department
Naval Safety Center (757) 444-3520 (DSN 564) Dial the following extensions any time during the greeting
Publications Fax (757) 444-6791

Mech Staff

Nika Glover	**Editor-in-Chief**
juanika.glover@navy.mil	Ext. 7257
AMC Brian Bailey	**Associate Editor**
brian.c.bailey2@navy.mil	Ext. 7293
Allan Amen	**Art Director**
allan.amen@navy.mil	Ext. 7248
John Williams	**Graphic Artist**
john.w.williams1@navy.mil	Ext. 7254

Analysts

LCDR Richard Thousand	**Aircraft Maintenance and Material Division Head**
richard.a.thousand@navy.mil	Ext. 7265
CW05 Daniel Kissel	**Avionics/ALSS Branch Head**
daniel.kissel@navy.mil	Ext. 7278
CWO4 Carlos Oreamuno	**Aircraft Maintenance Branch Head**
carlos.oreamuno@navy.mil	Ext. 7258
AFCM Corey Speer	**Aircraft Maintenance Assistant Branch Head**
corey.speer@navy.mil	Ext. 7269
MGySgt William Potts	**System Maintenance Assistant Branch Head**
william.potts@navy.mil	Ext. 7276
AMC Brian Bailey	**Airframes/Hydraulic**
brian.c.bailey2@navy.mil	Ext. 7285
GySgt Robert Godwin	**Airframes**
robert.godwin@navy.mil	Ext. 7292
AMC Shana Goodman	**Airframes**
shana.m.goodman@navy.mil	Ext. 7190
ADCS Elmer Bagtas	**Powerplants**
elmer.bagtas@navy.mil	Ext. 7190
ADC David Cook	**Powerplants**
david.f.cook@navy.mil	Ext. 7219
GySgt Greg Dutton	**Powerplants**
orin.g.dutton@navy.mil	7291
GySgt John Ayo	**Logs and Records/TD/CTPL**
john.ayo@navy.mil	Ext. 7239
AZC Marcus Fuller	**Logs and Records/TD/CTPL**
marcus.fuller@navy.mil	Ext. 7222
AECS Brian Grimes	**Avionics**
brian.grimes@navy.mil	Ext.7256
ATCS Daniel Eborn	**Avionics**
daniel.eborn@navy.mil	Ext. 7280
GySgt Theophilus Thomas	**Avionics**
theophilus.thomas@navy.mil	Ext. 7291
PRCS James Adams	**ALSS/Egress/Environmental**
james.l.adams@navy.mil	Ext. 7290
AMEC Tom West	**ALSS/Egress/Environmental**
thomas.e.west3@navy.mil	Ext.
ASCS Angel Santos	**Aviation Support Equipment**
angel.a.santos1@navy.mil	Ext. 7187
GySgt Daniel Devine	**Ordanance**
daniel.d.devine1@navy.mil	Ext. 7140
LT Tracy Mackey	**Facilities Branch, Fuels, CFR/ARFF, Bash**
tracy.mackey@navy.mil	Ext. 7281
ACC Christopher Sweet	**Air Traffic Control**
christopher.e.sweet@navy.mil	Ext. 7240
ABCM Tyrone Roseborough	**ALRE/Air Terminal**
tyrone.roseborough@navy.mil	Ext. 7218
Code 12 All Call Number:	
safe.avnfdbk@navy.mil	Ext. 7812

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.

Mech (ISSN 1093-8753) is published quarterly by Commander, Naval Safety Center, and is an authorized publication for members of the Department of Defense. Contents are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense, or the U.S. Navy. Photos and artwork are representative and do not necessarily show the people or equipment discussed. We reserve the right to edit all manuscripts. Reference to commercial products does not imply Navy endorsement. Unless otherwise stated, material in this magazine may be reprinted without permission; please credit the magazine and author. Periodicals postage paid at Norfolk, Va., and additional mailing offices.

POSTMASTER: Send address changes to Mech, Naval Safety Center, 375 A Street, Norfolk, VA 23511-4399.
Send articles, BZs and letters to the address above, or via e-mail to the Mech staff, SAFE-Mech@navy.mil.

Features

School of Aviation Safety, Quarterly Newsletter
https://www.netc.navy.mil/nascweb/sas/newsletters.htm

www.facebook.com/NavalSafetyCenter

www.twitter.com/NSC_Updates

Get Twitter Video Updates at: www.twitter.com/NSC_Vid_Updates

WATCH OUR VIDEOS at:
www.youtube.com/navalsafetycenter

Departments

Maintenance personnel ready an AV-8B Harrier assigned to Marine Medium Tiltrotor Squadron 161 (Reinforced), 15th Marine Expeditionary Unit, for take-off aboard USS *Essex*. (U.S. Navy photo by Sgt Emmanuel Ramos)

HSC-2 maintenance department personnel tow an MH-60 to the flightline after repairs. (Navy photo by Visual Info Spec John W. Williams)

EDITOR'S NOTE
WHERE IS THE GOLDEN WRENCH?

Following the lead of our flagship magazine, *Approach*, we have hidden a wrench icon within the cover design. It is smaller than the wrench pictured here In previous issues it was Navy blue and on the TOC page. We hope you enjoy this issue. Thank you for submitting your BZs, stories and articles they are invaluable to our mishap-revention efforts.

Maintenance Causal Class A Flight Mishaps FY 15

from 01 Oct 14 - 18 Mar 15

5 Class “A” mishaps with 1 (20%) maintenance related ($1,309,648).

- **MV-22B Near aircraft ditch. Crewchiefs egressed into the ocean, 1 fatality.**

Maintenance Class B and C Mishaps FY15

from 01 OCT 14 - 18 MAR 15

50 Total Class B/C Mishaps totaling $3.7M (34 pending cost analysis and 21 pending further investigations)

- **FAILURE TO FOLLOW PUBLICATION/LACK OF SUPERVISION (15)**
  - *** 1 Class B ($452,540)**
  - *** 14 Class C ($1.48M including 3 low power turn mishaps. 4 mishaps pending further cost analysis)**
- **FAILURE TO PERFORM PROPER RISK ASSESSMENT (12)**
  - *** 12 Class C ($544,926 including 4 tow/move evolutions.**
  - *** 10 mishaps pending further cost analysis)**
- **ATTENTION TO DETAIL (1)**
  - *** 1 Class C ($95,907)**
- **MAINTAINER SLIPPING/FALLING (1)**
  - *** 1 Class C (fractured 3 ribs)**
- **CAUSAL FACTOR PENDING ANALYSIS (21)**
  - *** 5 Class B ($1.1M with all pending further investigation and 4 cost analysis)**
  - *** 16 Class C (all pending further investigation and cost analysis)**

The Importance of a Cranial

By AO3 Hunter Hughes

We were nearing the end of the final phase of a comprehensive unit exercise in the fleet readiness training cycle and would soon be combat-ready. In two weeks, we'd return home for some well-deserved leave prior to an extended deployment.

It seemed like it would be a normal day when I looked at the flight schedule the night before. I walked into the ordnance shop and prepared for work on the flight deck donning a float coat, cranial, gloves and my tool pouch. Then we were off to the flight deck to relieve the previous shift.

My shipmates and I loaded ordnance for the flight schedule. As the quality assurance safety observer (QASO) watched over us, we launched 10 aircraft from the deck of the USS *Carl Vinson* (CVN-70). When the jets landed for the night, it was extremely dark. With only minimal lighting on the deck, our colored flash lights cut through the darkness. That's when the hard work began.

Maintenance throughout the night flowed smoothly. Ordnance personnel armed and de-armed aircraft in preparation for the next day's flight schedule. We downloaded ordnance for wash jobs and release-and-control checks. Then we began to download bullets into a linkless ammunition loading system (LALS). We began to upload PGU-27 20mm training rounds into the aircraft guns, and as my chief and QASO looked over my shoulder, I positioned myself on a step in order to "time" the gun.

Afterwards, I stepped down to pull the LALS outboard. I grabbed the handle on the MHU 191 and slowly pulled the LALS away from the aircraft so that I could time the LALS. Once the LALS was complete, I pushed the MHU 191 closer to the jet so I could connect it to the gun. After the LALS was connected to gun, I stepped down to pull the MHU 191 out to put tension on the belts. When I let the brake down, I turned, hitting my head on the corner of the starboard aileron, which went right below my cranial shell and stabbed me in the upper eyebrow. Most of the impact was on the top half of the cranial shell. An inch lower and it would have been in my eye. Had I been wearing goggles, the stitches I received would not be there today.

AO3 Hughes is attached to VFA-81

By AM1(AW) James Webb

While deployed within the U.S. Sixth Fleet Area of Responsibility (AOR), the op tempo at our P-3C airframes shop had been light. At our main hub, Naval Air Station Sigonella, there were a few sorties per day, daily inspections following flights, and the typical routine of scheduled and unscheduled maintenance actions. The good life, however, quickly changed to a recurring cycle of countless hours inside a dark, cramped and potentially toxic environment, following the results of a routine fuel sample.

In the course of a long-range, turbine-powered, Navy patrol mission, ranging from the warm humidity of near sea level atmosphere to the extremely cold upper atmosphere, some water vapor will condense within the fuel tanks. More will be absorbed directly by the jet fuel, and free water will often settle and accumulate on the tank floor. Frequent sump draining is an important part of preventive maintenance on the P-3C, eliminating the usual hazards of water in fuel.

Fuel is sampled on every daily inspection to make sure it is suitable. If water contamination is observed, the sample is discarded and a gallon is drained before taking another. If the next sample is clear and free of any substance then the aircraft fuel is safe. If the sample has contaminants, it is labeled and delivered to the nearest fuel-sample facility for analysis.

One day, while taking fuel samples from each low-point drain, one of our Sailors saw what appeared to be slimy brown matter suspended in water within one of the fuel sample jars. The young technician did exactly what he was trained to do: he notified maintenance control and ensured quality assurance involvement. The fuel sample was immediately sent to the local fuels division at NAS Sigonella, who confirmed particulate contamination and water content beyond the acceptable limits. The fuels technician suggested it was biological growth. We knew what we were dealing with: microbiological contamination.

Looking for the Smoking Gun

To understand the problem, we thoroughly reviewed the *Aircraft Discrepancy Book* (ADB). Custody of the aircraft had been transferred to our squadron a few weeks earlier by another squadron that was ending a seven-month deployment. We discovered that this aircraft operated forward deployed for 14 months prior to the discovery.

Deployed maritime patrol and reconnaissance squadrons operate out of numerous locations, some of which are not U.S. military airfields. The provisions at these airfields may differ significantly from what we receive at home fields. For example, Djibouti Ambouli International Airport (HDAM) uses commercial JET

A-1, which does not contain the additives normally included in military fuels. Fuel additives such as Fuel System Icing Inhibitor (FSII) and its commercial variant were not used at some of the locations in the area of responsibility. These additives help prevent entrained water in fuel from freezing, specifically preventing the occurrence in and around filters and valves.

While the P-3C does not require icing inhibitors, we discovered that a positive side-effect of these anti-icing additives is their performance as biostats: they prevent the development of rapid microbiological growth. This added benefit, we believe, would be particularly important in hot, humid environments where water is more likely to condense and accumulate in fuel tanks.

So What's the Big Deal?

What many maintainers may not know is that the slimy brown material which may appear to be nothing more than a nuisance is actually fungus and/or bacteria that produce extremely corrosive waste products. Microbes are present in most aviation fuels. However, they exist in negligible amounts and propagate in free water accumulations within jet fuel tanks, forming a mat-like colony that adheres to tank flooring. Often these colonies cannot be removed by draining fuel. If the microbial growth is accelerated due to high humidity and high temperature, it will consume the fuel and other food sources within the fuel tanks, and the waste products can become entrapped in concentrated levels which will subsequently cause rapid corrosion of surrounding metal. The waste products can also become trapped inside of components, filters, and fuel nozzles, degrading their performance or, in the most extreme cases, cause them to fail completely. Obviously this issue is not one to take lightly, and not one we were willing to take any shortcuts on while completing the fuel-cell decontamination.

Time To Act

Integral fuel cell repair is an unscheduled variety of maintenance and a specialized work in which true proficiency is acquired only through practice. It involves spaces which only experienced spelunkers would enjoy: small, dark and hazardous conditions, requiring careful maneuvering through baffle holes and various wing and fuselage compartments. Confined space entry is regulated by the Occupational Safety and Health Administration and further governed by the Naval Aviation Maintenance Program, under the designation of the Aircraft Confined Space Program.

In the confined spaces of a fuel cell, the most common hazard is the jet fuel. The residual fuel and fumes are toxic and flammable; they can ignite under certain temperatures and vapor concentrations. Other hazards arise from sealants, lubricants, and other chemicals used in the maintenance and repair of the cell. Our P-3C airframe technicians were well-versed in fuel-cell maintenance procedures, tending to leaks, repairing and restoring the integrity of the fuel tanks. However, we found no reported hazard reports or documented cases of squadrons having to "dive" all of the fuel tanks, let alone manage the daunting task while operationally deployed across three separate detachment locations in Europe and Africa.

Considering the amount of time required to make the necessary corrective actions, augments were requested and provided without delay from other P-3C squadrons and our neighbor in Sigonella, the Aircraft Intermediate Maintenance Detachment (AIMD). These augments provided added capacity that helped expedite the procedure by diving two tanks simultaneously. This balancing act required two dedicated teams working in parallel.

The first step of the decontamination procedure involved the removal and inspection of explosive suppressant foam (ESF) baffling, a technical directive (TD) incorporated to prevent the development of vapors within the fuel tanks. The TD, implemented at the Fleet Readiness Centers, utilized four teams of three workers, each dedicated to a fuel cell. In total, this TD encompasses more than 400 man-hours of labor, opening and venting the tanks, and installing ESF baffles. We knew we had an exhausting feat ahead of us: removing and reinstalling the ESF following any necessary repairs to the cells.

We found microbiological contamination in four fuel tanks (tank five was okay). Technicians noted that most of the contaminants in the tanks had distinct outlines observed around the edges of the foam where microbiological growth was concentrated.

Bubbled sealant containing a musty smelling liquid was discovered surrounding multiple rows of rivets.

To clean the tanks, a 9:1 ratio of fresh water and aircraft soap was applied, and all deteriorated sealant was removed and replaced. A recently purchased pneumatic fuel vacuum proved extremely helpful collecting the waste from within the fuel tanks and removing the dried biological contamination from the removed foam baffles. ESF baffles meeting rejection criteria were replaced with new pieces, cut from a supplied block of foam. Foam baffling was reinstalled and tanks were closed and sealed. All four engine high-pressure filters, low-pressure filters, and fuel-heater strainers were replaced as a precaution, even though engine efficiencies checked good and sluggish and erratic performance was not observed. After 27 days of extensive decontamination work, the aircraft was fueled, leak-checked and returned to the flight schedule.

Lessons Learned and Recommendations

Fuel-tank entry and repair is hazardous and must be approached with caution, but this work does not have to place maintenance personnel at risk. Preparation and supervised execution are the enablers to success. In order to minimize exposure in the hazardous, confined spaces, we used deliberate Operational Risk Management (ORM) procedures. For example, at the beginning of each shift, a brief was conducted to identify team members, their responsibilities, goals and limitations, and the fuel-cell rescue plan. Fuel-cell workers were rotated around a work-center-led schedule, ensuring no more than a 1:1 ratio for time in the cell and out. When prolonged time in the tanks caused excessive soreness and skin irritation to some technicians, our leadership responded by placing the affected maintainers in back-up safety observer roles to limit their exposure. "No speed faster than safe" quickly became a motto that our "Skinny Dragon Tank Divers" lived by.

Our squadron developed guidelines on approval authority based on time limits in the fuel cells. This ensured risk was managed at the appropriate level and prevented control measures from being neglected. Managing time spent in and out of the fuel cell and manpower augments from AIMD and sister squadrons helped manage personnel limitations and fatigue.

We recommend that squadrons verify the quality and source of fuel they accept. If possible, limit JET A-1 use or request FSII additives, and take immediate action if biological growth is detected. As a precaution, our crews operating out of Djibouti began drawing fuel samples post-flight in attempt to capture all water accumulation caused by condensation following descent from many hours at high-altitude. We developed an aircraft rotation plan, trying to move aircraft out of high-risk locations every 90 days, to limit the likelihood of biological growth in a hot, humid environment

It took us just under a month to complete the entire decontamination procedure, a massive effort encompassing more than 2,000 man-hours. This experience demonstrated the value of taking the time to properly evaluate major evolutions and apply ORM principles. In the end, the safe completion of every task is what counts. Even when it really counts, there is still "no speed faster than safe."

AM1 Webb is the Quality Assurance Leading Petty Officer with VP-4

NIGHT FLIGHT DECK MAINTENANCE

By AME1(AW) Roy Devolgado

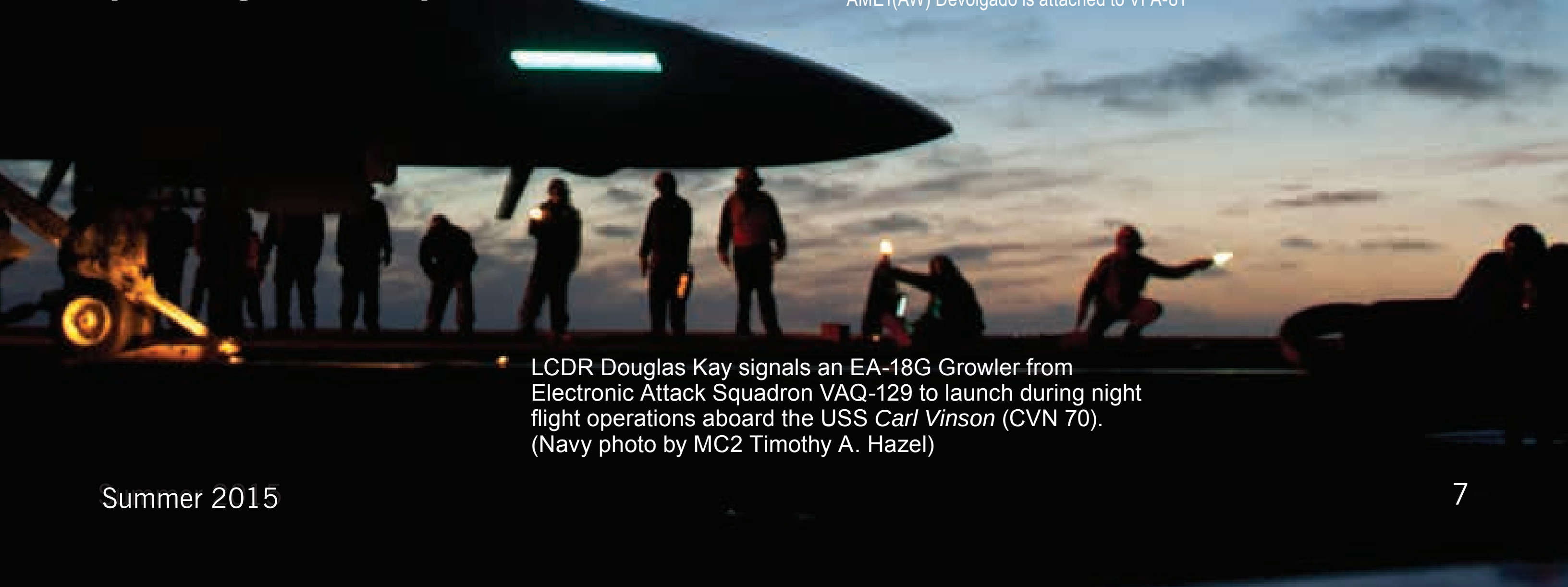
My squadron had successfully completed the Fleet Readiness Training cycle and was combat-ready.

We had just returned from a leave period and were two weeks away from an extended deployment. We had been working on rebasing five 728-day inspections two months prior. To add to this hectic workload, we also had a recurring ECS discrepancy on aircraft 205. To give ourselves more time to focus on deployment preparation and 728-days, we put aircraft 205's electronic control system (ECS) discrepancy on the back burner.

Once underway, an experienced AME3 and I were finally able to direct our efforts to fixing 205. With 39 knots of wind across a pitch-dark flight deck, it was not the best night for maintenance. We used extreme caution while working on top of the aircraft. We removed panel 49 to gain access to the system flow modulating pressure regulator valve as per IETM and placed the panel under our tool box. While installing the new valve, the flight deck went to "deceptive lighting" and the ships speed increased. As the wind began to blow harder, the panel was suddenly blown off the aircraft. It hit the deck and then it fell over the fantail. We immediately notified Maintenance Control and conducted a FOD walk down of the area around 205 and the fantail. We didn't recover the panel.

Maintenance on the flight deck is not the same as working on the flight line or in the hangar bay. In those extreme wind conditions, we should have put greater effort into securing removed panels. Someone could have been seriously injured by the panel. We wouldn't have lost the $400K panel had we put it in the cockpit, used a chain to secure it to the deck, or even placed it in the nearest shop.

AME1(AW) Devolgado is attached to VFA-81



LCDR Douglas Kay signals an EA-18G Growler from Electronic Attack Squadron VAQ-129 to launch during night flight operations aboard the USS *Carl Vinson* (CVN 70). (Navy photo by MC2 Timothy A. Hazel)

THE 18 INCH RULE

By AM2 Carlos Pereira and AM2 Michael Thierry

When we walked to the plane, it was supposed to be just another routine A-Check. On the P-8A Poseidon, this check is a regularly scheduled maintenance inspection every 90 days. Each subsequent A-Check peels back another layer of the aircraft that may have not been previously inspected or seen. We were doing the A-4 check, meaning it was the fourth check of its kind since the aircraft's acceptance into the fleet.

Each inspection is a little different than the last, but they are usually straightforward with few surprises. The hangar was busy that afternoon. Day and night shifts were working together to get the job accomplished so the aircraft could return back to the flight line ready to execute missions in support of 7th Fleet operations. Any P-8A sitting in the hangar for an extended period of time affected the fleet's overall mission capability.

Working in Kadena's usual scorching summertime heat and humid conditions in the hangar, we were on task card 54-800-01-01, which required removing the 431DL panel located on the forward strut fairing of the No. 1 engine. After removing the panel, we had to thoroughly inspect the area, check the integrity of the structure, and look for any corrosion or cracks – theoretically, a quick, 15-minute inspection.

For every maintainer who works daily on aircraft, the 18-inch rule is second nature. It is a simple concept, but keeping it in mind forces you to be constantly aware of your surroundings and ensures nothing is missed or overlooked. We use it every time we work on a discrepancy. This way, we can notice other discrepancies, corrosion, cracks, FOD, leaks, and abnormalities that would have not seen otherwise.

In this case, we were surprised to find an unknown tool that had clearly suffered the wear of time and moisture. It was heavily corroded, resting on a spot on the hydraulic line that appeared to be flattened out over time. The tool did not have any VP-5 markings nor was it a recognized tool in our squadron inventory.

We reported the find to a nearby maintenance chief (AEC Craig Leathers), who was assisting with the wing panels. AEC Leathers took the tool to Maintenance Control, who confirmed it did not belong to the squadron and forwarded it to the squadron's Quality Assurance team for further investigation.

The tool had originally been used to install Adel clamps. It had a small wooden handle and a thin, rectangular blade. It posed a serious threat to the safety of the aircraft while trapped away in the confines of the 431DL panel. Because of the constant flowing of hydraulic fluid throughout all phases of flight, the hydraulic line in which the tool rested on becomes heated. As the line warms up, it expands and becomes more pliable. After numerous takeoffs, landings, accelerations and decelerations by the aircraft, the tool repeatedly moved back and forth over this line. The friction generated from the tool onto the warm pliable line gradually developed a dangerous flat spot, with the line itself becoming thinner on the surface. The damage to the hydraulic line was so significant that the aircraft was immediately put in a "down" status until further investigation and awaited a new hydraulic line.

This specific hydraulic line belonged to System A of the P-8A aircraft. If the tool was not discovered and the line was allowed to become more degraded over time, it risked eventually being punctured at the location of the flat spot and 3000 psi of pressurized hydraulic fluid could have spewed out of the line into the engine casing. The pilots flying the aircraft would unknowingly brace themselves for an eventual loss of hydraulic system A, resulting in a loss of many components critical to flight. Some of the major components powered by that hydraulic system are the aircraft's ailerons, elevator, rudder, landing gear, flight and ground spoilers, and the number one engine thrust reverser for landing rollout. This demonstrates how severely damaging and dangerous one small missing tool or similar FOD can be to an aircraft and its aircrew.

AM2 Pereira and AM2 Thierry are attached to VP-5

In the photo on the opposite page the tool is barely visible, but when compared to this photo it becomes evident. This photo shows the entire tool used to install Adel clamps on the aircraft, yet, it is not a part of VP-5's tool inventory.

BravoZulu

Preventing Mishaps

Regarding "The 18 inch rule" story from the opposite page, VP-5 leadership offered comments on the teamwork of AM2 Pereira and AM2 Thierry.

AM2 Pereira and AM2 Thierry are two of the most professional and hardest-working maintainers of a very highly skilled and well regarded maintenance team in VP-5. They humbly claim that anyone else in their position would have made the same discovery. While that might be true, their efforts in discovering the missing tool should not go unrecognized. Sometimes the most difficult practices are not the ones you necessarily train for every day, but rather the ones that require constant persistence and forceful adherence. In aviation maintenance, it is important to remember the basic fundamentals that you were trained on and to proactively exercise them every day. Over time, the technical expertise will grow and the simple concepts might go to the wayside. AM2 Pereira and AM2 Thierry have the technical acumen to strip an engine apart and put it back together, but on this day, it was a basic technique that fixed a serious hazard. They could have quickly completed their work and moved on uneventfully to the next task in the arduous and lengthy A4 check, but their dedicated professionalism and awareness paid off.

The Crack Felt

Our Wing made an immediate assessment of the situation and knew there was a much larger problem.

By AD1(AW) Bryan McGinty

As a Quality Assurance Representative (QAR) for the Bear Aces of Carrier Airborne Early Warning Squadron (VAW) 124, I have conducted many inspections and have experienced my fair share of "catches." On a recent inspection, I found something that caught me off guard.

The USS *George H.W. Bush* had steamed east for our 2014 deployment. After the air wing's carrier qualifications, Bear 602 flew aboard for the transit across the Atlantic. When it landed, we discovered a cracked main scavenge oil line on the port motor. She was taken down to the hangar bay for repair.

Our maintenance department quickly set to work on 602, discovering that a collapsed reduction gear box (RGB) mount had caused the original problem. Within a day, we had the port motor repaired and ready for low power turns. All that was left was for QA to look it over and perform a FOD-free check to ensure that all maintenance had been done by the book and nothing had been missed.

During the foreign object debris (FOD)-free inspection, I was in the port outboard hot section panel, looking in the forward direction and doing my QA checks. As I finished and pulled my arm and flashlight out of the hot section access panel, I noticed a small fuel leak coming from the center of the port nacelle wing. Knowing that this was abnormal, I immediately began tracing the fuel leak up the nacelle

U.S. Navy photo by MC3 Raul Moreno/modified to the center wing butt where the wings lock into place when being spread for launch.

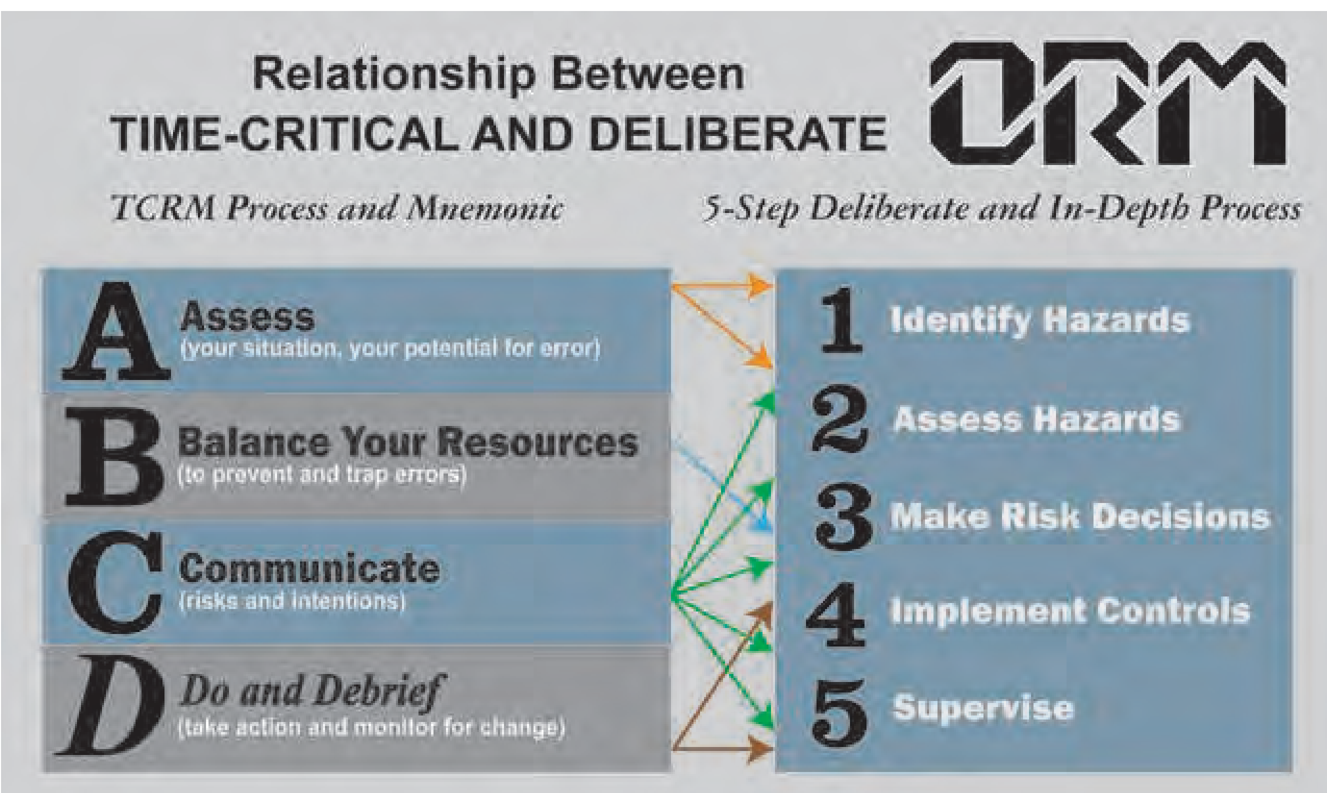
The fuel cells for the E-2 are just on the other side of the bulkhead. I discovered fuel pooling at the base of the wing butt. After an extensive search around the aft upper wing lock cylinder area, I discovered what looked like a small crack in the bulkhead, not more than a few inches in length. To the untrained eye, the crack appeared to be nothing more than a small jagged line drawn in pencil. After running my finger over the area, I confirmed the worst: a crack had penetrated the bulkhead and into the fuel cell.

Immediately I notified Maintenance Control of my initial assessment and began the standard process of taking pictures to document every detail of the discovery. Our command forwarded the information to the COMACCLOGWING commander and maintenance officer, as well as the other maintenance departments in our sister squadrons throughout the community to see if this was an isolated incident or a possible wider issue with the entire Hawkeye fleet.

To our surprise, several other squadrons found similar structural cracks in the same area on their aircraft. Our Wing made an immediate assessment of the situation and knew there was a much larger problem. What originally seemed like a straightforward inspection led to a key discovery that saved the community from a possible Class A mishap due to a wing structural failure or fire. As a result of our inspection, the entire Hawkeye fleet was “red striped” and placed in a down status temporarily until all E-2s worldwide (including those in France, Taiwan, Japan, and Egypt) could be inspected for similar structural cracks/issues and verified safe for flight.

When it comes to being a part of Quality Assurance, you are the last line of defense when certifying that an aircraft is safe for flight. Taking the time to ensure that all maintenance is completed properly and giving that extra look to make sure nothing is wrong pays huge dividends.

AD1(AW) McGinty is attached to VAW-124

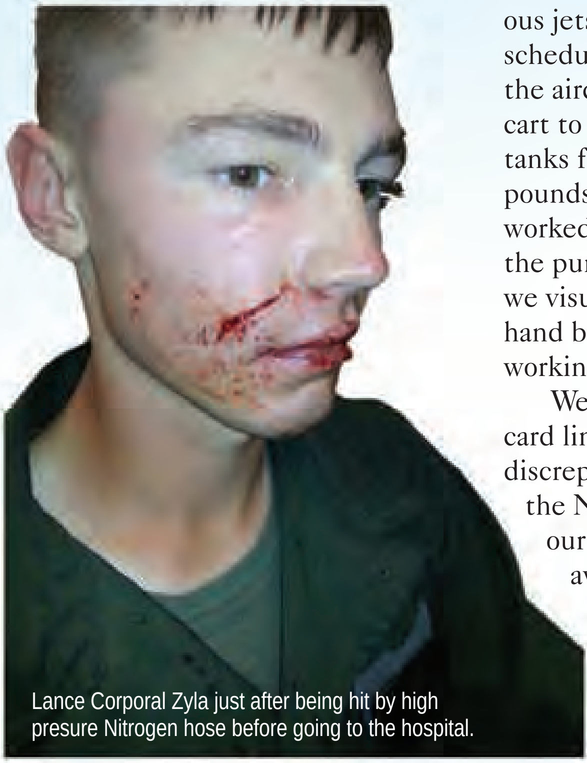


3 Points of Contact

By Lance Corporal Jacob Zyla

It was a Friday morning in beautiful San Diego and I was just starting the day, already looking forward to the weekend.

The entire unit had just completed a three hour "safety-stand down" the day before and had discussed at length the use of PPE and "flight line situational awareness." I had just finished assisting two fellow Marines in the servicing of numerous jets that were on the day's flight schedule. Prior to heading out to the aircraft, we checked the NAN-cart to make sure that none of the tanks fell below the minimum 500 pounds per square inch (PSI). We worked all the levers and made sure the pump functioned, and then we visually inspected the tires and hand brake to ensure they were working as well.



Lance Corporal Zyla just after being hit by high presure Nitrogen hose before going to the hospital.

We followed the pre-operation card line by line and found no discrepancies. We then checked out the NAN-cart from SE to begin our tasks. I have always been aware that there are many things within the F/A-18 community that are dangerous (engine exhaust, numerous people moving around turning jets), but I never really considered much of the ground support equipment (GSE) to be dangerous. The exception is the NAN-cart or nitrogen cart. I would soon learn that the NAN-cart is dangerous, but not for the obvious reasons.

The NAN-cart has several tanks that contain nitrogen presurized to about 3000 PSI which is used to service struts, APU accumulators, and emergency brakes on F/A-18s before flights and during other maintenance actions. Everyone is very cautious when working with such high pressures of nitrogen, especially around aircraft. I was about to discover another reason why NAN-carts are dangerous.

LCpl Lopez, PFC Veal, and I were assigned to do the morning Pre Flight servicing on the aircraft. As PFC Veal was finishing servicing the right main landing gear on the last jet, he handed off the hose to me in

Lance Corporal Zyla demonstrates the three points of contact which should be used when handling highly presurized hoses/systems like that of the NAN-cart.

order to bleed down the manifold pressure. LCpl Lopez proceeded to turn off the pump as I grabbed the hose and put it underneath my arm with three points of contact with the nozzle facing behind me.

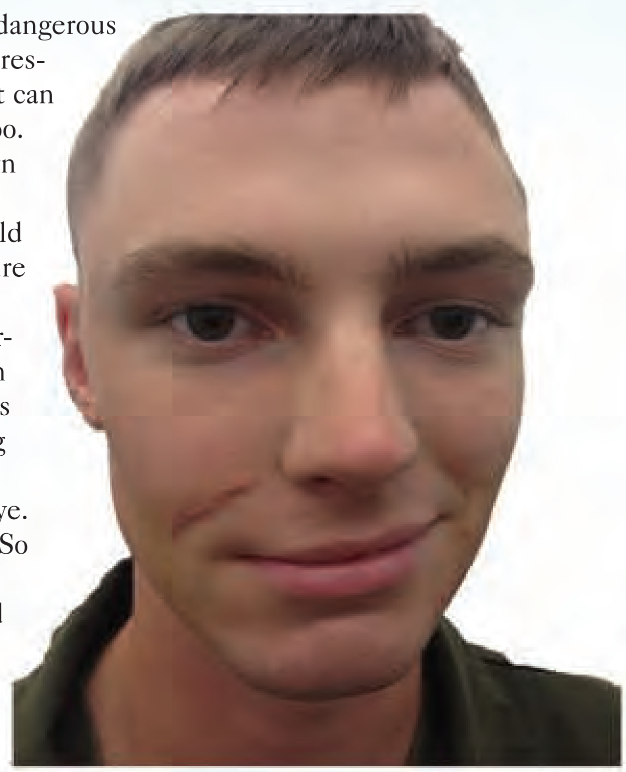
As I proceeded to bleed the extra nitrogen out of the hose, I made a crucial mistake. Instead of slowly bleeding the hose, I cranked the valve wide open causing the hose to pressurize quickly and slip out of my arm. The hose then jumped out of my control and slashed my face on the right cheek leaving a 2-inch laceration.

LCpl Lopez heard a loud bang as I dropped the hose and moved out of harm's way, which prompted him to dump all the remaining pressure in the line to stop the hose from moving and injuring anyone else. Although I was wearing my cranial and the proper PPE, it did not protect me from acquiring a real nice wound.

Once it was confirmed that I had been bitten by the NAN-cart, I walked back to the shop with PFC Veal and informed our SNCOIC, AM1 Billings, of the accident so that he could call for an ambulance. After a lengthy stay at the hospital, 15 new stiches on my face, and an SIQ chit for three days, I realized that in fact, a NAN-cart can be dangerous for more than just high pressures in the cylinders—it can reach out and bite you too.

If anyone should learn anything from this accident, it is that they should be cautious of the pressure in hoses and tanks. Pre-operation is just as important as proper PPE. Even though the laceration was under my goggles, having my cranial on saved me from getting hit in the eye. I could have lost an eye. So always keep three points of contact on pressurized hoses from the NAN-cart and have a firm grip.

The author after being hit by high presure Nitrogen hose, a lengthy stay at the hospital, 15 stiches to the face, and an SIQ chit for three days.



By AN David Powell

NOT SO WIDE OPEN SPACES

One only needs to step out on an open flight deck prior to deployment to appreciate how large a Nimitz Class Aircraft Carrier really is.

From bow to stern the flight deck is over 1,090 feet and it is 252 feet wide at its largest point. This enormous four acres of sovereign U.S. territory becomes an extremely busy and crowded place when, we (the air wing) and our seventy plus aircraft come out for deployment. In an instant, what once was a calm, quiet, and open space becomes jam-packed, noisy, and above all….dangerous. All around there are turning propellers, spinning rotors and invisible jet blast ready to knock you off of your feet if you are not ready.

It was a beautiful day during our recent COMTUEX in the VACAPES area and although my primary duties are that of an E-2C Hawkeye plane captain for the Bear Aces of VAW-124, I was assisting in the propeller safety chain for our C-2A sister squadron, the VRC-40 Rawhides. This is not uncommon, during most cyclic operations, VAW squadron personnel are often called upon to assist the COD squadrons with boat support since the majority of their maintenance personnel are on the beach.

As we get ready to begin startup of the engines the propeller safety chain will establish itself around the aircraft, typically at just about a double arm interval. We are pretty hard to miss, about a dozen or so maintainers with arms extended moving our hands up and down to alert others to the fact two large propellers are turning and to beware and watch out. Just like most of the procedures handed down in the navy most are written in blood and this procedure is no different. Once a safety chain has been established it is common practice to not allow the chain to be broken for anyone, regardless of rank, without approval from the plane captain in charge.

The startup for Rawhide 54 was normal and we maintained our chain during the various prelaunch checks. As the PC proceeded through the aircraft on deck checks a motivated ABH2, from the ship, made a dash from the static E-2 that was parked next to the COD breaking through the propeller safety chain established by me and my fellow shipmates. In the blink of an eye he was heading directly toward the starboard propeller of

the COD. Without hesitating, I quickly reached out and grabbed him pulling him back from within inches of the spinning prop. He came so close that other maintainers on the flight deck were flinching and hiding their faces to avoid watching a shipmate possibly meet his end. With the eight blades of the Hawkeye and COD spinning at 1,106 revolutions per minute that sailor most certainly would have been cut up without the propeller skipping a beat.

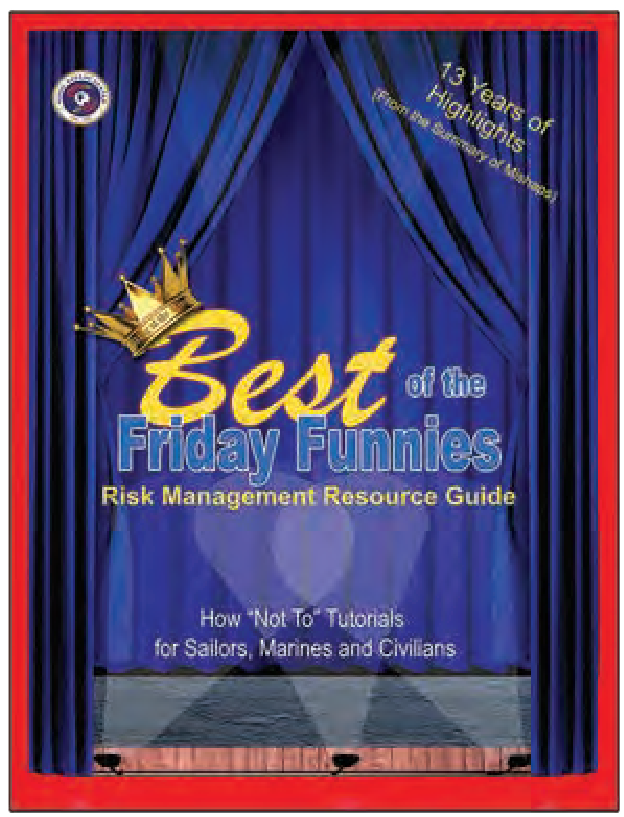
Propeller aircraft having been operating from flight decks since the beginning of US Naval Aviation and in VAW and VRC squadrons, you are taught from the very beginning to treat the propeller and the area around it with extreme respect. You are not even allowed to go through the propeller arc when it is static unless you are doing major maintenance. This really helps to drive home the respect the propellers need to be given.

The next time you walk on the flight deck pay special heed to your friendly propeller safety chain and the big warning in yellow on the side of the island that reads, "BEWARE OF JET BLAST, PROPELLERS, and ROTORS." It will save your life.

AN Powell is with VAW-124

Standby for a New Resource from the Naval Safety Center

Fans of the Naval Safety Center's Summary of Mishaps ALSAFE message are in for a treat. A special issue magazine entitled "The Best of the Friday Funnies" is in production. It will feature the highlights (lowlights?) of the past 13 years. As regular readers know, the Funnies aren't simply brickbats tossed at unwitting personnel. They are mini-seminars from the college of hard knocks, except you don't have to suffer any knocks plus you get to (figuratively) stand around, raising your eyebrows and thinking, "What a knucklehead!" The only price is that you have to think about how you would have managed the risks (or inanimate objects) that overwhelmed the people in the stories. To get your copy, send your mailing address to safe-mediafdbk@navy.mil.




GET CON
Wear Your Harness and Lanyard–
Avoid Injuries!
01-10-05 Nov 2014 JWW

NECTED!

USMC photo by Capt Nick Arnold, USMC
MAG-26 Fall Prevention Program

LEADERSHIP PERSPECTIVE

Factors that Influence Risk Acceptance

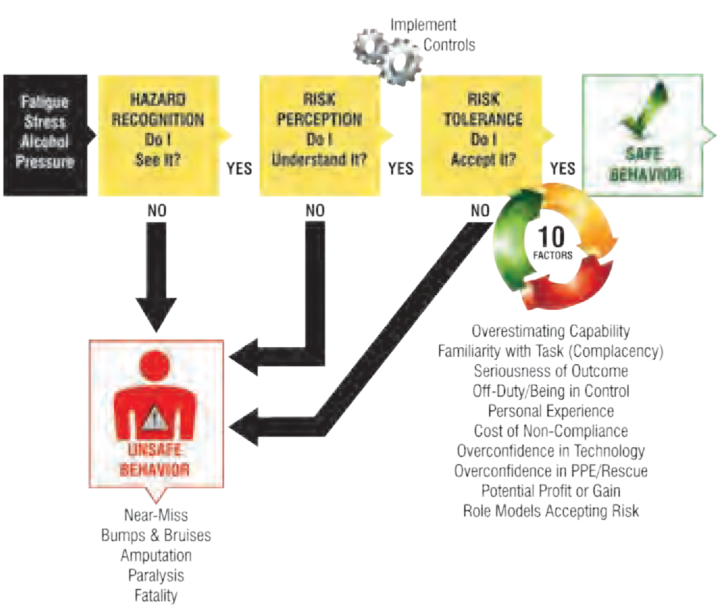
By CMDCM (AW/SW) Paul Kingsbury
Command Master Chief, Naval Safety Center

Far too often safety gets a bad rap. The "products" of safety are narrowly seen in terms of policies that slow down work or require unwieldy or unattractive PPE. Who really digs wearing that glow-belt during PT or wearing a hard hat and safety glasses in the shipyard? These perceptions can distract us from truly thinking about risk-taking behaviors that we should understand and strive to influence.

Consider that in the course of a typical workday, our people literally make millions of risk decisions. From the time we wake up, we are engaged in activities that involve hazards and risks. The risk-decision-making process involved only takes a matter of seconds but can result in outcomes that have significant financial, operational, and emotional cost for the individual and organization. Safety leaders can positively shape the decisions their people make. Leaders must understand that although their people may identify hazards and understand the outcomes, a variety of factors can influence them to take more risk than they should.

Before we explore the factors that influence risk acceptance, we have to understand the fundamental process of making risk decisions. Figure 1 outlines the process that occurs and how the outcome of each step can lead to a safe or unsafe behavior.

Fig. 1: The risk-decision-making process



We've done a good job at identifying hazards, labeling them and training on them. However, we must also identify the new hazards presented by new missions and evolving technologies. We're OK at ensuring our people understand the outcomes that can result from failure to implement hazard controls, but we must continue to educate in order to pass on the corporate memory of mishaps. The area we fail to effectively understand and influence is how individuals make the decision to acceptance or reject risk once the hazards are known and understood.

What the model does not capture are the factors that can skew the decision-making process from the start, including stress, fatigue, and alcohol use. These can all affect our ability to identify hazards and understand outcomes; they influence how much risk we accept. We've constructed an entire risk-management model around this decision-making process. Supervision is the important last step of our five-step deliberate risk management process for a reason: it's the element that is key to identifying weaknesses in the individual decision-making process and provides the opportunity to stop at-risk behavior before it occurs.

We often hear the mantra of "management by walking around," but do we consider it in the context of shaping the risk decision-making process? For example, we supervise maintenance evolutions to identify where our people are taking too much risk by not following procedures, not using PPE or falling victim to a lack of experience. We also supervise lower level leaders to ensure they are not modeling poor behaviors and are helping look for these 10 factors as well. *(See next page.)*

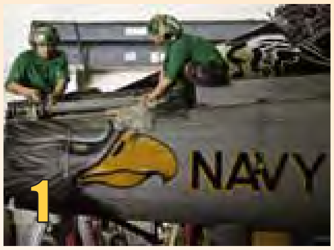
Understanding these 10 factors reinforces the value of knowing our people so we can identify behavioral changes that occur when they are distracted, tired or inebriated. In turn, we make better management decisions and don't put them in situations where they are unable to make effective risk decisions.

Sometimes the most important concepts to understand about leadership are the ones we take for granted. Taking time to understand how our people think about risk and the ways that you can influence that decision-making process will go a long way to making you a more effective leader while improving organizational performance.

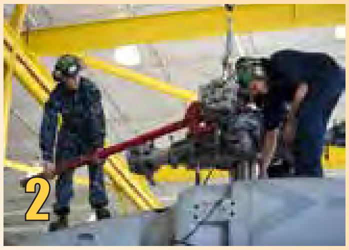
The 10 Factors of Risk Tolerance

As a safety professional, you can positively shape the risk decision making of your Sailors. Although they may identify hazards and understand the outcome, a variety of factors may still influence them to accept more risk than they should. Let's take a look at what can influence risk tolerance and what safety leaders can do to shape those behaviors.

Adapted from "Strategies for Understanding and Addressing Risk Tolerance," Exxon Mobil, 2011. *U.S. Navy photos*



Overestimating capability (younger people) and experience (role models). Reflect on your role as a mentor, admit that despite your experience the exposure is still there. Acknowledge skill but reinforce policies and procedures.



Familiarity resulting in complacency. Encourage Sailors to focus on the task like it's the first time they have done it. How would I teach this to a new person? Stop and think. Draw from knowledge, skill and techniques.

Underestimating seriousness of the outcome. A hazard could involve a "pinch point" but the outcome actually results in amputation or crushing. Hazard identification should better define the outcome. Get people to ask, "How bad could it really be?" Apply the ABC*D* process. Teach Sailors worst-case scenarios.

Voluntary actions and being in control. Key factor in off-duty risk (people are 28 times more likely to be hurt off the job). Overconfidence and false sense of control may lead to underestimating risks. Integrate "stop and think" moments into personal activities. Use checklists to improve situational awareness.

Personal experience with an outcome. If you've seen a mishap or a near-miss that ended badly, you will be less tolerant of the risk. However, as incident rates improve, fewer leaders will have had these experiences resulting in scepticism. Know what incidents have occurred and point out the consequences. Tell sea stories.

Cost of non-compliance. Identify the cost of non-compliance and increase where necessary. As the actual or perceived cost increases, the risk tolerance decreases. Remove barriers and reward those who gauge risks and mitigate the factors that increase the potential for error.

Confidence in equipment. Overconfidence in technology increases risk tolerance. Ensure technical training captures the limits of equipment and engineering. Promote the ABC*D* process and on-the-spot risk assessment. Make sure Sailors know how to gauge risk. Teach them to ask, "What if it fails?"

Confidence in PPE and rescue. Relying solely on PPE and rescue efforts increases risk tolerance. Emphasize the limits of protection and rescue measures. Ensure Sailors understand these as "last line of defense" or "not to be relied upon" controls. Provide appropriate ORM and TCRM training.

Potential profit or gain. Perceived or actual (fiscal, emotional, physical) gains increase or decrease risk tolerance. Remove rewards for risk taking. Eliminate barriers to doing it the right way. Bring these concepts into leadership discussions to increase awareness.

Role models accepting risk. Leaders' actions influence the mindset, behavior and decision-making abilities of their workers. Identify and address risk-taking leadership (in the appropriate situations). Recognize perceived pressure that could lead to erosion of standards and address immediately.

Maintainers in

ANAN Arturo Gourentchik, assigned to VAW-116, performs maintenance on a E-2C Hawkeye on the flight deck of the USS *Carl Vinson* (CVN 70). (U.S. Navy photo by MC2 John Philip Wagner)

ABH Thoren Pond removes chocks and chains from an MH-60S Sea Hawk helicopter assigned HSC-26 during flight operations aboard the USS *Mitscher* (DDG 57). (U.S. Navy photo by MC2 Anthony R. Martinez)

AE Megan Dennis, performs pre-flight operational checks aboard the USS *George H.W. Bush* (CVN 77). (U.S. Navy photo by MCS Ciarra Thibodeaux)

AD3 Kaithlin Bush, and AD2 Joseph Debonopaula both of HSC-2 power plants dept search for parts using the PEMA. (U.S. Navy photo by Visual Information Specialist John W. Williams)

the Trenches

Marines assigned to 31st MEU perform maintenance on the engine of a UH-1Y Huey helicopter on the flight deck of the USS *Bonhomme Richard* (LHD 6). (U.S. Navy photo by MC3 Kevin Cunningham)

AWS2 Danielle Moder, assigned to the HSC-8, conducts lookout procedures during a familiarization flight, for pilots and air crewmen. (U.S. Navy photo by MC1 Shannon Renfroe)

AM2 Jessica Gonzalez assigned to HSC-6, takes apart a spindle for a rotor head on an MH-60S helicopter in the hangar bay of the USS *Nimitz* (CVN 68). (U.S. Navy photo by MCSN Siobhana R. McEwen)

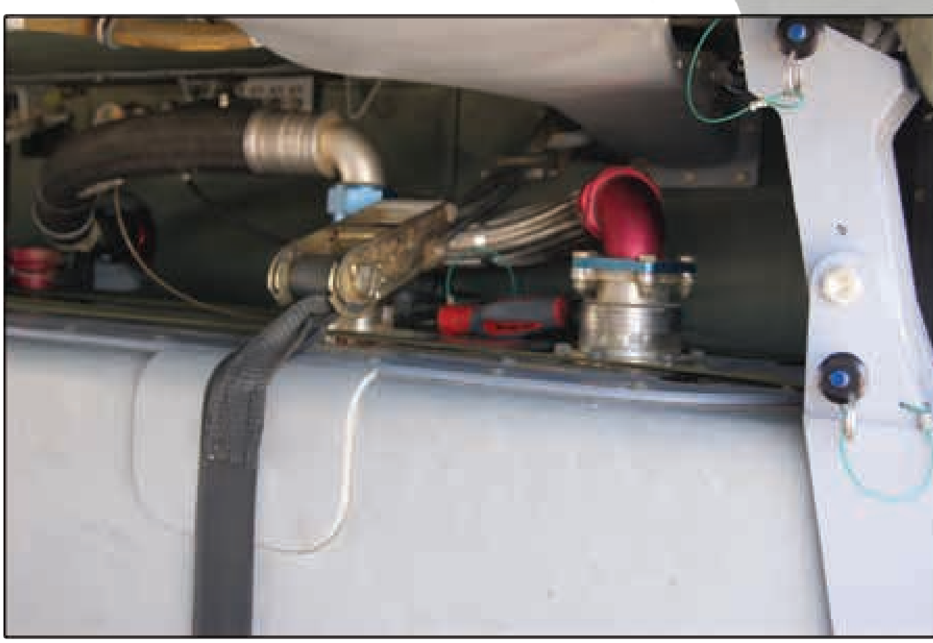
AE2 Nick Lacey, assigned to HSC-15, inspects the electrical system of an MH-60S Sea Hawk helicopter in the hangar bay of the USS *Carl Vinson* (CVN 70). (U.S. Navy photo by MC2 John Philip Wagner)

MISSING TOOL

AM1 Benjamin Bailly

The morning started uneventfully. The sun was shining, and the temperature was chilly for mid-March in San Diego Readers who haven't been acclimated to San Diego weather probably don't know that the long sleeves and foul weather gear come out the minute the temperature drops below 65 degrees. I was out on the flightline, soaking in the beautiful morning (in my foul weather gear), waiting for the pilots to walk out to preflight aircraft 611.

I was an Airframes troubleshooter, ready to assist the pilots and aircrew with any last-minute discrepancies. Preferably, troubleshooters at HSC-6 are at a minimum CDIs. I am a fully qualified CDQAR. Troubleshooting moves a lot more smoothly when you have experienced personnel out there. I had my tool pouch on my shoulder and I was ready for anything they could throw at me or I thought.



The screw driver is just barely visible under the strap lockdown.

During preflight, the HAC (who happened to be the XO) noticed that someone had left the cap off the internal auxiliary fuel tank on the extended range fuel system (ERFS), inside the cabin. The XO ordered the fuel be re-sampled. A MAF was immediately issued to the line division to perform the sampling procedures.

Taking fuel samples is usually simple: you drain a small amount of fuel into a Mason jar and inspect for contaminants. An airman arrived from the line shack and asked me what he was supposed to do. That was mistake number one. Always put yourself "in-work" on a MAF before starting the job. You should also tell maintenance control what you will be doing and what aircraft you will be working on. He had no idea he was needed to take fuel samples.

A fuel-sample kit was brought out, and the Airman donned the required PPE. Since I am a CDI, I offered to help out and inspect the samples once they had been taken. Starting the sampling process, he had to remove the aux tank fuel cap, because it had been replaced when it was found open. I noticed that he was struggling with the cap and loaned him the flathead screwdriver out of my tool pouch, to help ease the cap open. That was mistake number two. Never just give out tools to anyone without documentation and a tool tag. Accountability is key to good maintenance procedures. The cap was finally removed and a sample taken.

The sample check was good, so the cap was replaced and I did an ATAF (all tools accounted for) of the fuel-sample kit. No discrepancies. However, I didn't do an ATAF of my own tool pouch, nor did I have the plane captain take a look at my tools. That was mistake number three. Always check all of your tools before leaving the aircraft. Had I complied with that simple procedure, I would have noticed that the flathead was not in the pouch, and the helicopter would never have started up, engaged rotors and launched with a screwdriver sitting on top of the fuel tank.

We proceeded back to the line shack to sign off the fuel-sample MAF. A tool ATAF is supposed to be conducted upon return to the workcenter, but since that was not my shop, and I was headed back out to the flightline after signing off the paperwork, I once again overlooked my tools. That was mistake number four, and the last opportunity I had to intervene in the bad situation that was unfolding.

After the remaining aircraft launched, I returned to the airframes shop and turned in my tool pouch. At that point, I finally discovered that the tool was missing from my pouch. I realized with a sickening feeling what had happened and I knew exactly where that !@#$%&* screwdriver was!

I immediately initiated the missing-tool procedures (which worked quite well), the aircraft was recalled and the screwdriver recovered. I got egg on my face and did a lot of worrying about what was going to happen to me in the near future.

Several unnecessary events had taken place simply because I hadn't followed procedures and had neglected to open a pouch and look inside. This situation could easily have been worse, but it also could and should have been avoided altogether.

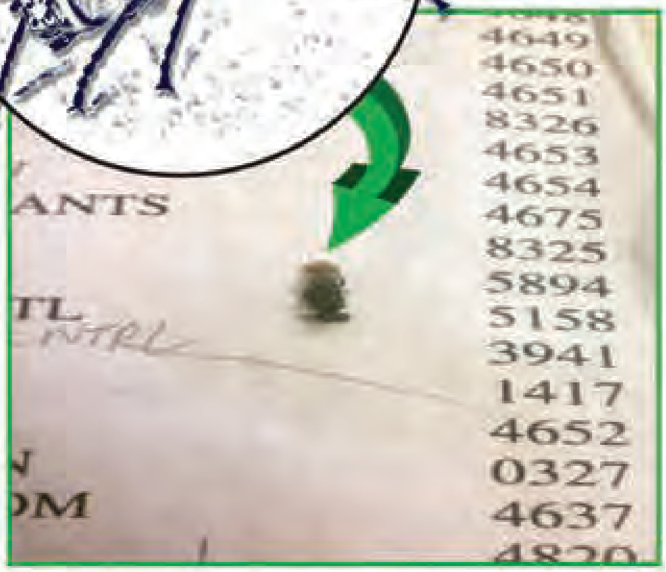
AM1 Bailly works in the Airframes Department of HSC-6

I realized with a sickening feeling what had happened and I knew exactly where that !@#$%&* screwdriver was!

AM1 Bailly (right), is shown with Airman Burris (left), after the aircraft was recalled and the screwdriver recovered.

A Fly in

By LCDR Christopher Swanson



On every flyoff, whether it is at the close of a six month deployment or a ten day detachment, there is always a certain level of anxiety that develops in all aircrew all you hope for is that there are no issues with your aircraft so that you can get wheels in the well and safely press on home.

We were closing out one of my last field carrier landing practice (FCLP) detachments for VAW-120, the Hawkeye/Greyhound Fleet Replacement Squadron (FRS) based in Norfolk, Va. The Greyhawks of VAW-120 did four to five FCLP detachments per year, descending upon Naval Air Station Jacksonville so that we could use the isolation of Naval Outlying Landing Field (NOLF) Whitehouse for our training. Getting out of Norfolk allowed us to get our students away from the distractions at home and concentrate on the task at hand, which was getting them prepared to land the most challenging carrier based aircraft onto a small postage stamp on the sea that all tail-hookers lovingly refer to as 'Mom.'

As the squadron operations officer I was also dual-hatted as the detachment officer in charge. I was responsible for six aircraft and about 150 aircrew, maintainers and civilians. With the amount of landings that the aircraft were subject to make, they naturally took a beating. Each one logged hundreds of passes and flew close to eight hours daily. With all that flying there bound to be gripes. Our maintenance could do just about anything but there were limitations especially as we vame to the end of detachment. Any down gripe before fly off could mean a multi-day delay in getting home.

We had just finished another successful detachment and had gotten a lot of great work done. As we finished our last set of FCLPs, my detachment maintenance officer and I were relieved to have all the birds come back from the last night period in an 'up' status. Daily turnarounds and inspections were completed. The birds were closed up and prepped for the morning flyoff back to Norfolk.

We arrived at the spaces ready to rock roll with no surprises. As the division flight lead, I conducted a mass brief to ensure all crews were on the same page. As we closed the brief with an ORM assessment we spent some extra time on the "get-home-it-is" factor. Frist, there was no hurry to get home–the actual fly off for our carrier qualifications was still a week away.

Our maintenance would not be boarding the NALO home until about 1400 which would give up some support if issues were to arise on man up. We all planned on staying with our aircraft to prevent confusion and we planned to launch separately if fallouts occurred. Lastly, all of my instructors were great professionals who had been on det before and we had all seen a host of things go wrong.

My crew and I walked out to man up our aircraft. We greeted our linemen and plane captains who had painstakingly looked over our aircraft. They were proud to release them to us and excited to see us get skyward

the Ointment...

so they could follow us home. I conducted a preflight check, looked over the outside of the aircraft and saw nothing wrong. We loaded our bags and gear and then we all took our positions in the aircraft.

My copilot and I ran through our prestart checks and we got ready to start. Before we could even fire up the motors, I immediately began to smell a faint electrical burn. I casually looked over at my copilot and asked if he smelled anything but he just kind of looked at me and said, "Nope, I think it's all in your head – let's get this thing fired up and go home."

I held the start and began to scan the cockpit. My attention was drawn to our elevator trim gauge which was pegged nose up. I leaned down to smell the trim switch on the yolk and sure enough got the rancid odor of burnt wires. I immediately pushed the "trim disconnect" button and pulled the elevator trim circuit breakers to cut power to the trim switch so as not to burn out the actuator and create an even bigger problem.

We passed off the lead to dash No. 2 and relayed the situation to our maintenance. You could here the collective sigh on the radio as they knew their work was not quite done. They quickly started pulling parts from the pack up kit (PUK) to get us repaired and get us back on our way. Since it was only a trim switch it was potentially an easy fix but one that would require some soldering and an hour or two of work. We ran up to the ready room to relax and let our professionals do their thing.

After about 15 minutes, I got a call from the maintenance desk to come down stairs. I got on the horn with our desk chief and asked him what was going on, "Sir, I found the problem, but you have to see it to believe it," he said. So, I walked down to maintenance. On the desk, in the middle of a phone list, to my surprise was the issue which had caused our delay. It appeared as if we had a stowaway looking to join us on our journey to Norfolk. Somehow this little fly had made it into the pilot's yoke and onto the terminals of the elevator trim switch. This created the bridge of current needed to run the trim and short out the switch almost to the point of causing a fire. Luckily he was the only thing burnt up in the process. This once self-propelled crispy little piece of FOD, thankfully weighing less than an ounce, took down a 54,000 pound aircraft and caused a two hour delay.

Maintenance made the repair and did a quick operational check. With nothing else wrong we walked to the aircraft again and manned up without incident. The trim worked very well with our "friend" removed. This time we were able to get wheels in the well and on our way. The two hour flight home was uneventful and we landed home in Norfolk without incident. After over 10 years of flying the Hawkeye on and off the ship I had been stopped on manup and launch for many things, but this was a new one and unexpected one to say the least.

LCDR Christopher Swanson, VAW-124 Safety Officer

I LEANED DOWN TO SMELL THE TRIM SWITCH ON THE YOLK AND SURE ENOUGH GOT THE RANCID ODOR OF BURNT WIRES.

VAW-120 aircraft are pre-flighted and prepared for the flight back to Norfolk, Va.

Photo by Clark Pierce

Bravo Zulu

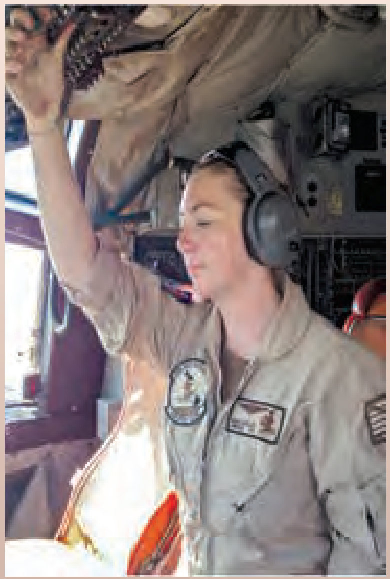
Sailors and Marines Preventing Mishaps

PR2 Justin Harvey
VAW-120

Petty Officer Harvey discovered that his shop's work bench was cracked in multiple locations. Recognizing that the bench was essential to the shop's maintenance efforts, he immediately notified the shop supervisor of the discrepancy.

The work bench was then broken down and repaired to withstand its rated 500 pound load capacity.

PR2 Harvey's attention to detail potentially averted serious injury to personnel had the work bench collapsed.



AM2 Amanda Dewelles,
VP-9

During a maintenance turn pre-flight inspection on aircraft 158224, AM2 Dewelles noticed the No. 4 engine's fifth stage over-wing duct plug was missing a nut on the back end of the handle. She immediately informed maintenance control and a FOD inspection ensued on all four engines.

Upon completion of the inspection, it was determined that the plugs and covers need to be checked for integrity during every pre-flight to account for all pieces. Her steadfast awareness and overall vigilance broke a chain of events that may have led to a potential mishap and ensured continued safe operations without injury.

AWF1 Michael Jones
VQ-3

While acting as a safety observer during an alert aircraft launch evolution, and after the long cord operator had already cleared engines No. 3 and No. 4 for start, AWF1 Jones saw additional crew members running toward the jet.

The forward lower lobe door had been opened by responding crew members and was still open as the remaining crew members were making their way to the jet.

Jones realized that an approaching crew member was planning to run directly to the lower lobe door which would have placed him directly in front of the intake of an engine being started. So he immediately signaled the crew member and directed him away from the danger area that he was about to enter. Jones similarly guided four more crew members that would have entered the engine danger area. AWF1 Jones' swift actions, which averted several potentially fatal mistakes, are in keeping with the superb safety culture which VQ-3 cultivates.

AD2(AW) Cheryl Scarlato
HSC-7

As collateral duty inspector, AD2 Scarlato was inspecting dusty 615 to ensure that the cap of the auxiliary tank and the fuel sump access panel were properly secured.

While inspecting the fuel sump access panel, she noticed one of the cam locks was not properly installed. She then crawled under the aircraft to secure the cam lock and noticed a large hole approximately 1 foot forward of the fuel sump access panel. She conducted a more thorough inspection to ensure there was no damage to the airframe, auxiliary fuel tank or fuel leakage. She immediately notified her LPO and maintenance control of the discrepancy. Scarlato prevented a possible mishap which may have resulted in serious damage and potential loss of aircraft and aircrew.

AM3 Jennifer Cartwright
HSC-7

While examining a broken passenger seat attachment point on dusty 615, AM3 Cartwright discovered a two inch crack along the structural frame forward of the cargo hook.

Upon closer examination, she found several dents in the vicinity of the crack on the underside of the aircraft. Acting quickly, she immediately notified maintenance control of the downing discrepancy.

Upon further investigation, the damaged structure was determined to be critical to external cargo operations and may have resulted in catastrophic failure if not discovered. Petty Officer Cartwright's diligence, keen attention to detail, and professionalism while performing her duties prevented a possible mishap which may have resulted in serious damage and potential loss of aircraft and aircrew.

ADAN Samantha Moore
HSM-48 Det.1

HMS-48 Det. 1 ADAN Samantha Moore was conducting routine corrosion prevention on the main rotor head of Venom 507 aboard USS *Leyte Gulf* (CG 55) when she noticed chipped paint around a few of the SH-60B's swashplate retaining bolts. A closer look revealed that there was also abnormal grease splatter in the vicinity of these bolts. Investigating further, Airman Moore checked a few bolts and discovered she was able to turn one by hand. Upon further investigation, detachment QA found multiple bolts that could be easily turned by hand.

With organizational level troubleshooting procedures exhausted, the Detachment contacted engineers at NAVAIR Depot Cherry Point for guidance. An engineering disposition was issued, and the findings revealed 65 of 69 swashplate retention bolts did not meet minimum torque criteria. In addition, several bolts exhibited worn or sheared threads. Retaining bolts on the swashplate are flight critical components, the failure of which could lead to a catastrophic loss of the main rotor head as well as the aircraft and crew. Airman Moore prevented a potential mishap through her dedication to her mission and her outstanding attention to detail.

Super Hornet Turtlebacks Have Soft Shells

By AM2 Justin Viduya

New technology comes with new problems, but you might not expect fragility. In the summer of 2014, having transferred our fleet of F/A-18C Hornets, our aircrew and maintainers had the good fortune to fly Lot 36 F/A-18E Super Hornets delivered directly from Boeing's factory.

One day, after the second flight of the day for our "CAG Bird" (aircraft 300), the plane captain (PC) noticed an issue with one of 300's panels. One of the fasteners on the forward, starboard edge of panel 18 (a panel on the upper fuselage directly behind the cockpit, termed the "turtleback") was spinning freely, possibly indicating that the underlying anchor nut was in need of replacement. The PC informed maintenance control of the issue, who then directed workcenter 120 (airframes) to investigate. I checked out the required tools and headed out to the flight line with three other aviation structural mechanics (AMs), including the PC who had discovered the issue.

I was a new Collateral duty inspector (CDI) on the F/A-18E platform. I had been a prior F/A-18A-D CDI for more than a year and was confident in my experience level and abilities. We replaced the old fastener with a new one and confirmed that the anchor nut was damaged when the new fastener spun freely as well. We removed panel 18 to examine the anchor nut underneath. On the F/A-18E, panel 18 is fastened to the fuselage through anchor nuts that are attached to a former (essentially a metal bar that matches the curvature of the panel). This former is a structural part of the airframe. These anchor nuts are attached to the former through brackets that are riveted on. We confirmed that the anchor nut threading was damaged and the entire anchor nut assembly needed to be replaced. We had to remove the rivets from the anchor-nut bracket.

The rivets installed from the factory are a "pop rivet" type, which have a retaining washer on the head of the rivet that is left after installation. This retaining washer must be loosened and removed by center-punching (making a small indentation in the center of the rivet head) before trying to drill through the rivet. Otherwise, the washer will spin and prevent the drill bit from penetrating the rivet body. Proper punching, drilling and removal of rivets and other attaching hardware are essential AM skills, and I saw this as the perfect opportunity to teach my fellow AMs how to remove this anchor nut.

I was careful to begin by showing them where to find the anchor-nut-removal procedures in

the interactive electronic technical manuals (IETMs). Then I talked them through the procedure step-by-step. I focused my training on the PC, who had recently struck the AM rate, and directed him to remove the anchor nut once I was confident that he understood what to do.

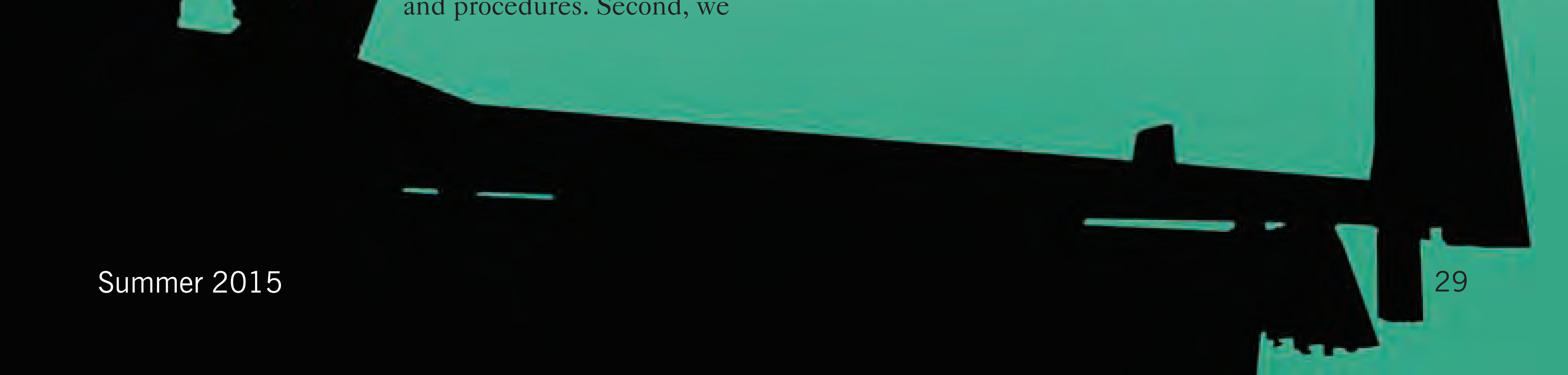
The procedure directed us to use a center-punch and a hammer to first remove the retaining washer on the rivets before drilling out the rivets. I positioned myself to support the former and instructed the PC to center-punch the rivet. The first strike didn't loosen the washer, so I directed him to strike it again. The second strike produced an alarming cracking sound. We stopped work and I inspected the former, discovering a crack near the anchor-nut assembly. I took the tools from the PC and finished removing the rivets and the anchor nut myself in order to inspect the damage underneath the anchor nut. As suspected, the crack extended from the rivet hole outward to the edge of the former. We immediately told maintenance control about the damage. We discovered upon further research that a cracked former was a depot-level repair requiring up to nine months of lead time. Despite exactly following the IETMs procedure, we had taken our "CAG Bird" off the flight line for the better part of a year with two strikes of a center-punch.

Plenty of learning points arose from this incident. First, it was irresponsible of me (the most experienced AM in the group) to direct a novice to perform this task without first demonstrating to him the proper methods and procedures. Second, we overestimated the strength of the Super Hornet's airframe and used too much force, even if the procedure called for a firm hand. Although the Super Hornet may be built to sustain significant combat damage, it doesn't mean that the airframe isn't easily damaged.

My squadron has since learned that other squadrons have experienced similar issues with this part, which leads to the third learning point: a more delicate procedure must be adopted when performing this specific type of repair. The method of first center-punching the pop rivets in a former has repeatedly proven risky. A new, recently-suggested procedure would involve drilling the pop rivet without center punching, while holding the drill at an angle and working the drill bit in a circular motion to drive through the retaining washer, thus avoiding the need to punch and remove the retaining washer before drilling.

As a more permanent solution, the possibility to transition from "pop rivets" to solid, counter-sunk rivets should be investigated. Pop rivets are typically used in confined spaces because they can be installed from one side of an object without requiring any access to the other side of an object. The turtleback former offers plenty of space for a pneumatic squeezer, and would allow the use of solid rivets. The use of solid rivets would eliminate any need to punch the rivet before drilling, thus reducing the likelihood of damage to the former when an anchor nut wears out. There currently is no restriction on the type of rivet used in repairs of these types of anchor nuts. Although I'm not planning on letting a novice make his best effort at maintenance with a hammer and center-punch anytime soon, I'm going to think twice the next time I use these same tools on a Super Hornet's airframe.

AM2 Justin Viduya is an Aviation Structural Mechanic in VFA-97



Maintenance Officer
LCDR Richard Thousand
richard.a.thousand@navy.mil

Editorial Coordinator
AMC Brian Bailey
brian.c.bailey2@navy.mil

PEMA

By-the-Book PEMA Management

By: GySgt John Ayo

During command safety assessments, we have discovered that the majority of central technical publications librarians (CTPL), quality assurance representatives (QAR) and work center supervisors do not understand Portable Electronic Maintenance Aid (PEMA) management. The COMNAVAIRFORINST 4790.25B lists detailed and necessary information on PEMA management. It also outlines responsibilities of the maintenance material control officer, quality assurance officer, IMRL manager, CTPL, work center supervisors and work center personnel.

In accordance with the COMNAVAIRFORINST 4790.25B, the CTPL shall:

(1) Manage PEMAs, technical data resident on

AZ1 Armando Ancayan assigned to HSC-2 maintenance dept serches for technical data and system updates prior to begining work. (U.S. Navy photo by Visual Information Specialist John W. Williams)

PEMAs and PEMA system software via ELMS PEMA Management Module on the NATEC website.

(2) Install PEMA system software updates per the applicable PEMA T/M/S specific directions described on the NAVAIR PMA260 website.

(3) Sub-custody PEMAs to work center supervisors.

(4) Ensure ELMS accurately shows the PEMA serial number and the work center issued to.

(5) Conduct PEMA inventories and verify PEMA system software is current:

(a) Prior to work center supervisor turnover.

(b) Prior to CTPL turnover.

(c) Quarterly (100 percent wall-to-wall physical sighting and configuration verification.

(6) Maintain a current local PEMA inventory sheet with hardware nomenclature, serial number, drop number (if applicable), quantity, location and operational status.

(7) Coordinate PEMA repair/replacement with IMRL Manager.

In accordance with the COMNAVAIRFORINST 4790.25B, work center supervisors shall:

(1) Accept custody and accountability for work center PEMAs.

(2) The technician and either the work center supervisor or collateral duty inspector (CDI) shall inspect the PEMA prior to starting each task and upon completion of each task.

(3) Ensure work center personnel understand the value and operational importance of PEMAs, and their responsibility to report incidents of PEMA misuse or abuse under the SE Misuse and Abuse Program in accordance with COMNAVAIRFORINST 4790.2B Chapter 7 para 7.5.4.

(4) Provide initial and annual follow-on training to work center personnel on:

(a) Proper use and handling of PEMAs and related technical data stored on PEMAs.

(b) PEMA foreign object debris hazards.

(c) Responsibility to utilize PEMAs for work-related functions only.

(5) Ensure PEMAs are properly stored and secured when not in use.

(6) Return non-working PEMAs and PEMAs missing parts to the CTPL for replacement.

The PEMA is the only approved hardware device for utilizing electronic versions of the NAVAIR Technical Manuals. Of critical importance is the need to ensure that the CTPL has the necessary supervision to keep PEMAs up-to-date for work center personnel. Furthermore, the cybersecurity procedures of the DoD Instruction 8500.01 and DoD Instruction 8510.01 shall be strictly adhered to per DoD cybersecurity policy. The COMNAVAIRFORINST 4790.25B is located on the NATEC Website under the ELMS menu.

Wiring

Zip Ties and Wiring: A recipe for disaster

By: AECS Brian Grimes

Assessment visits to a variety of Navy and Marine Corps units has revealed a shocking discovery, the use of zip ties to secure wiring in our aircraft. Seems like no big deal right. WRONG! It's a huge deal. The use of zip ties can result in chaffing of wiring. Which causes shorts, leading to catastrophic events. Also, FOD is an issue as they age, become brittle and the locking mechanisms break. Imagine a zip tie that finally fails and migrates towards an area to jam a primary flight control just as that aircraft is taking off the front end of the flight deck. You guessed it…a recipe for disaster. However, this is not only an issue at the Organizational level, but also at the Intermediate and Depot levels as well. Maintainers have to get back to the basics of wiring repair and follow the directions of our maintenance publications. Let's see what the wiring repair manual says about this.

The *INSTALLATION AND REPAIR PRACTICES VOLUME 1 AIRCRAFT ELECTRIC AND ELECTRONIC WIRING:* NA 01-1A-505-1, WP 10, para 69 states: "The use of plastic cable straps (Zip Ties) is strictly prohibited in all instances."

The INSTALLATION AND REPAIR PRACTICES VOLUME 1 AIRCRAFT ELECTRIC AND ELECTRONIC WIRING: NA 01-1A-505-1, WP 10, para 69 states: use of plastic cable straps (Zip Ties) is strictly prohibited in all instances."

As we acquire new Sailors and Marines to our commands, we must ensure in our training that we not only train towards system knowledge, but that also includes training them on the basics. Don't take for granted that you know how to perform a certain task and not review the publications. Procedures could have changed. If you are not getting back and re-familiarizing yourselves in the basics, then we cannot hope to train our junior Sailors and Marines effectively. When the aircraft specific publication does not detail how a job is to be performed, don't forget to use the general NAVAIR publications. Supervisors, QA, and CDIs must provide the expert supervision during wire repair to prevent the unauthorized use of these items. Strict adherence to wire routing and repair procedures cannot be overstressed, therefore the need to use and understand both the aircraft specific maintenance publications along with the *NAVAIR* 01-1A-505 series publications is imperative.

Remember, there are many miles of wiring in our aircraft and we need to be vigilant in providing the adequate protection for that wiring. Seek out the "how-to" in your references and train from the publications often. Let's continue to provide the safest aircraft possible.

Tires and Wheels

Do You Have Your Training Material

By GySgt Robert Godwin

During command safety assessments, we have discovered that most units either do not have or only have VHS tapes of the required tire-and-wheel video with no way of playing them.

COMNAVAIRFORINST 4790.2B Chapter 10.6 states the program manager shall be knowledgeable of all references. The program manager is supposed to provide indoctrination training to applicable personnel, prior to performing tire/wheel maintenance, regardless of rating/MOS, placing emphasis on hazards associated with aircraft/SE/AWSE tires/wheels. Another requirement is to train personnel transporting tire/wheel assemblies to enable them to identify inflated/deflated tires, be aware of associated safety hazards, and properly handle/protect bearings. The program manager must ensure personnel selected to perform aircraft/SE/AWSE tire/wheel maintenance are fully trained and qualified prior to submitting for certification.

The program manager must also ensure that the following video cassettes are available for use as instructional aids (as required):

(1) "High-Pressure Gases in Aviation" (24795DN) (required).

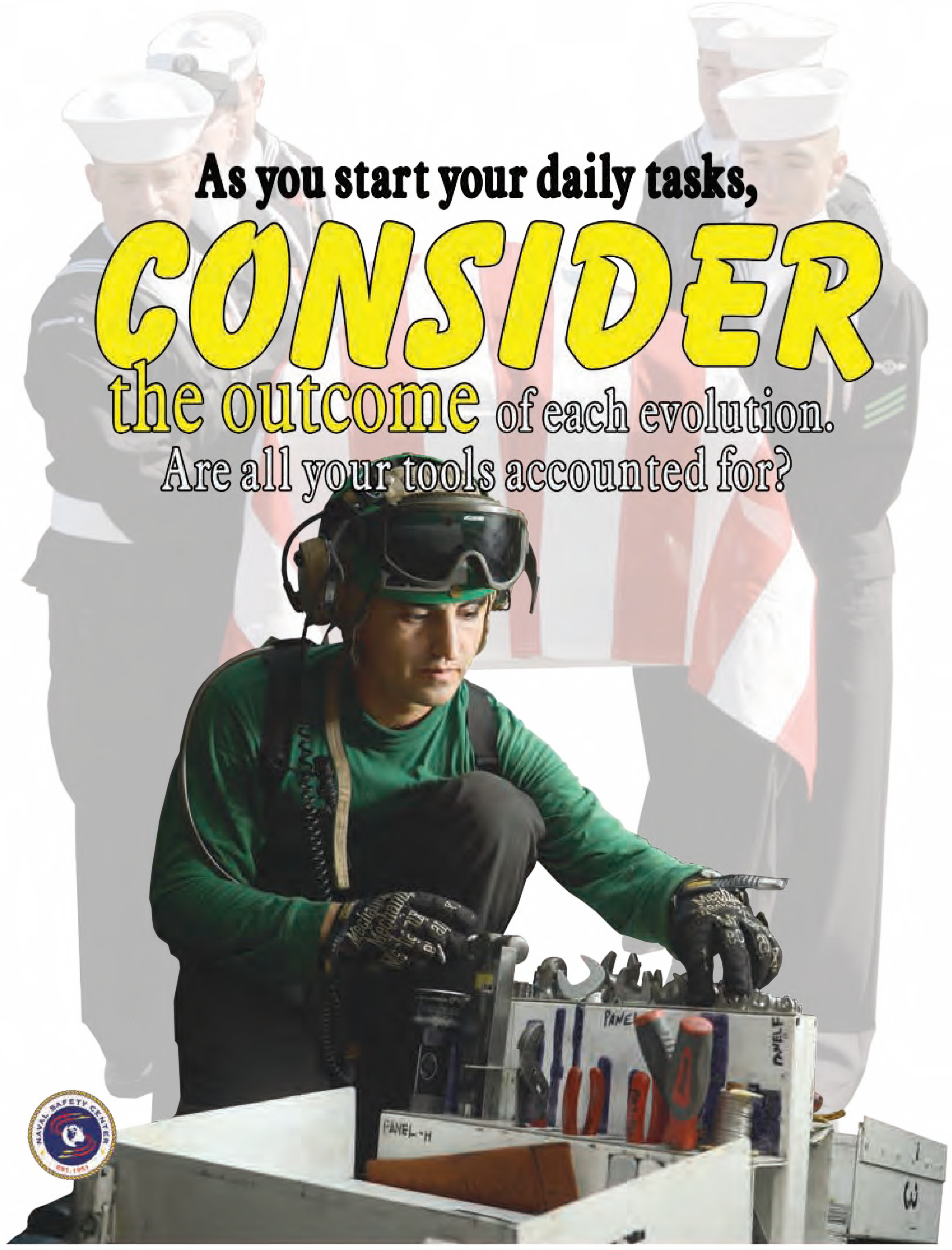
(2) "Rebuilding High-Speed High-Performance Naval Aircraft Tires" (25784).

(3) "Servicing Multi-Piece Wheel Rims" (OSHA) (recommended, SE and AWSE only).

(4) "Servicing Single-Piece Wheel Assemblies" (OSHA) (recommended, SE and AWSE only).

To obtain training videos, contact Defense Imagery Management Operations Center by sending a feedback ticket through http://www.dimoc.mil/customer/contact.html. You can email a request to askdimoc@dma.mil or call customer service at 888-743-4662, DSN 795-9872, or 570-615-9872. You may also contact them for various other training and safety videos. Watch the below You Tube video to better understand the hazards and risks involved with the Tire and Wheel Program. www.youtube.com/watch?v=HANwJp8Z5mc.

U.S. Navy photos by Visual Info Specialist John W. Williams


As you start your daily tasks,
CONSIDER
the outcome of each evolution.
Are all your tools accounted for?