2016, Vol. 61 No. 3

Approach

The Navy and Marine Corps Aviation and Aviation Maintenance Safety Magazine

The Heat is On

Fixing Sudden Cockpit Temperature Changes

Flying Blind

See How One Pilot Lands Safely Without Instruments

See MECH: Now on back cover

Approach- MECH

The Navy & Marine Corps Aviation and Maintenance Safety Magazine

2016 Volume 61, No. 3

RDML Christopher J. Murray, Commander, Naval Safety Center
Col Matthew Mowery, USMC, Deputy Commander
Maggie Menzies, Department Head, Media and Public Affairs
Naval Safety Center (757) 444-3520 (DSN 564)
(Dial the following extensions any time during the greeting to reach the desired person.)
Publications Fax (757) 444-6791
Report a Mishap (757) 444-2929 (DSN 564)

Approach-MECH Staff

Nika Glover, Editor-in-Chief juanika.glover@navy.mil, Ext. 7257
John Williams, Visual Information john.w.williams1@navy.mil, Ext. 7254
Allan Amen, Visual Information allan.amen@navy.mil, Ext. 7248

Aviation Safety Programs Directorate

CAPT John Sipes, Director john.sipes@navy.mil Ext. 7225
Kimball Thompson, Deputy Director edward.thompson@navy.mil Ext. 7226
CAPT William Murphy, Aircraft Operations Division Ext. 7203
CAPT Mike Penny, Aeromedical Division
LT Alexa Sandifer, Explosives/Weapons Division Ext. 7164

All Analyst

safe-code11@navy.mil Ext. 7811

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.*Approach* (ISSN 1094-0405) is published bimonthly by Commander, Naval Safety Center, 375 A Street Norfolk, VA 23511-4399, 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. *Approach* is available for sale by the Superintendent of Documents, P.O. Box 979050, St Louis, MO 63197-9000, or online at: bookstore.gpo.gov. Telephone credit card orders can be made 8 a.m. to 4 p.m. Eastern time at (866) 512-1800.Periodicals postage paid at Norfolk, Va., and additional mailing offices.

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Approach

On the cover:
A pilot flies an F-5N Tiger II. The photographer Jose Ramos is also a pilot. His work has been featured in many publications and websites. You can view more of his work at www.ramosaviationphotos.com.

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We want honest appraisals and realistic solutions. Our staff is always open to new ideas, so don't be afraid to try something different. We also want your input. Send your letters, opinions, viewpoints, and comments to safe-mediafdbk@navy.mil.

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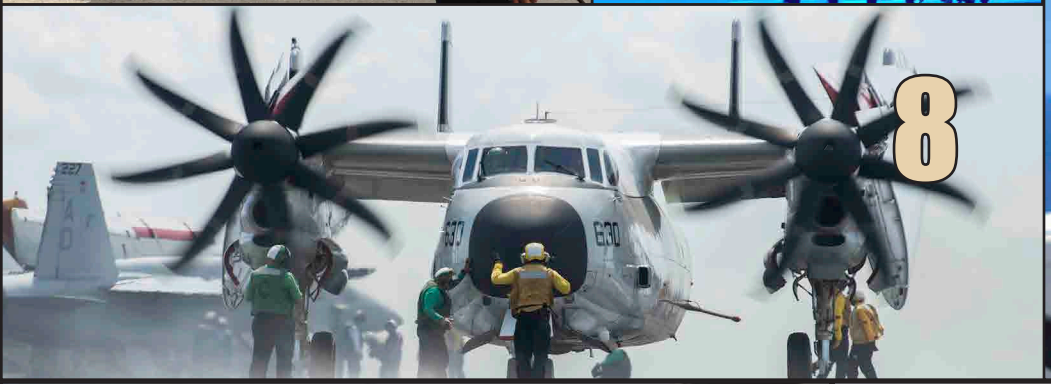


BY LT PETE KOWALCYK, VAW-120

When CRM Fails, Mishaps Follow

This is a radio call that no aircrew wants to hear from tower while rolling down the runway, yet this is exactly what occurred on Sept. 1, 2015. Although the pilots were able to safely abort the takeoff, the incident was still severe. As instructors at VAW-120, the E-2/C-2 fleet replacement squadron, we are fleet-experienced aviators that are susceptible to the same crew resource management (CRM) pitfalls as anyone who has ever donned a flight suit.

On that day we had multiple events, both pilot and NFO training sorties, scheduled for our 3-hour flight. This is a normal flight expectation for VAW-120 and as instructors; we fly these types of training flights multiple times a month. Additionally, we would need to hot refuel at the beginning of our flight. However, due to the hot pits closure at our home field, Naval Station Norfolk, we decided to fly to NAS Oceana to hot refuel. Once we cleared the runway at Oceana, the pilots folded the wings and began taxiing to the refueling pits. In the cockpit, the pilots noticed and communicated to the NFOs a standard central air data computer (SCADC) failure and would be troubleshot post-refueling. The aircrew ran the appropriate hot refuel checklist and shut down the starboard engine (leaving the port engine running) in accordance with NATOPS.

After the crew completed refueling, the pilots conducted a wind-milling start of the starboard engine. The pilots started a slow taxi out of the pits, at the same time, the NFOs started to troubleshoot the SCADC failure with concurrence from the pilots. The instructor NFO sent one of his students to the forward equipment compartment (FEC) to reset the SCADC circuit breaker. Scrambling to get the weapon system ready prior to takeoff, the instructor NFO directed his student NFOs to deselect the pilots on the intercommunication system (ICS) to improve combat information center (CIC) communication. While the instructor NFO did have the cockpit selected, he became "comm-saturated" due to the multiple radios selected, students ICS communications, and training being conducted. This ultimately led to the CIC separating from the cockpit, and the beginning of the CRM breakdown.

LT Chris Sloan gives a presentation to VP-16 aircrew members on crew resource management (CRM). CRM training is designed to improve the overall safety of flight. (Photo by Petty Officer 3rd Class Charles E. White)

Meanwhile in the cockpit, the pilots were very busy working clearance, adjusting plans to complete the pilot sorties, and passing the controls and radio responsibilities. This was a unique mission because the pilots were conducting an instructor standardization check that required the pilot to fly from the right seat (copilot seat). As the pilots taxied down the taxiway, and unbeknownst to the NFOs, ground control had requested Greyhawk-55 to take an intersection departure on runway RW23L. The pilots initially heard on tower that there were two F/A-18s cleared for landing on RW23L. The entire crew missed the tower radio call that changed the F/A-18s'clearance to land on RW23R. Not realizing that the F/A-18s were cleared to land on the parallel runway and attempting to get ahead of the traffic, the pilots accepted the intersection takeoff. Greyhawk-55 initiated a roll-and-go takeoff without coordinating with the NFOs.

As Greyhawk-55 began to accelerate, the instructor NFO noticed the wings still folded and immediately called out to the pilots, "What is going on?" Around the same time, Oceana tower asked, "Greyhawk-55, confirm wings open?" The pilots immediately decelerated while calling, "Abort, abort, abort."

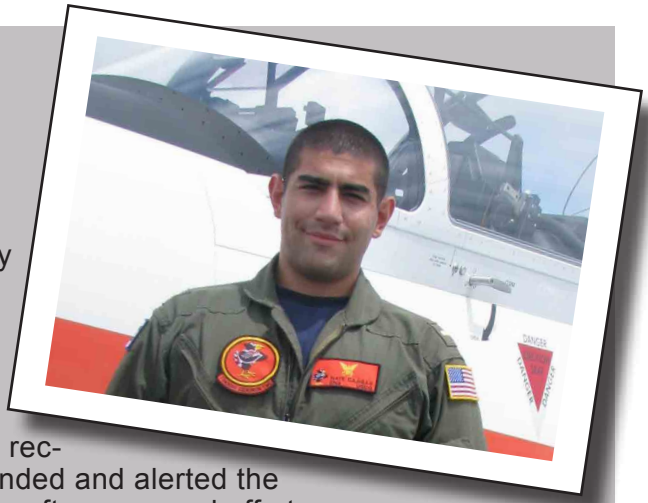
The crew aborted the takeoff and safely exited the runway. While a mishap was avoided, the incident serves as a wakeup call for not only the aircrew but the E-2/C-2 community as well. We, as the instructor pilot and instructor NFO, have learned a great deal from this incident and believe our story can help our peers, not only in the Hawkeye and Greyhound communities, but also naval aviation at large. The "get it done regardless" mentality coupled with complacency can lead to errors that we as seemingly experienced aviators and aircrew cannot allow to happen, regardless of experience or how many times you've done this before.

Editor's Note: LT Brant Brock, with VAW-120, also contributed to this article.

Approach Bravo Zulu

Sailors and Marines Preventing Mishaps

ENS NATHANIEL CAJIGAS, VT-2



On April 4, 2016, Ensign Nathaniel A. Cajigas, USCG, a flight student with VT-2 at Naval Air Station Whiting Field, Fla. demonstrated exceptional diligence and superior situational awareness while standing the assistant runway duty officer watch at Navy Outlying Field Evergreen, Ala. A Student naval aviator flying a T-6B aircraft called in a "pattern low key with gear extended" while conducting a practice precautionary emergency landing from the pattern, but he had not actually extended the landing gear. While managing crowded and dynamic T-6B operations, Ensign Cajigas recognized the approaching aircraft did not have its gear extended and alerted the runway duty officer immediately. Due to his actions, the aircraft was waved off at approximately 300 feet. Ensign Cajigas' outstanding decisiveness prevented a gear up landing saving both the aircraft and crew.

CDR BRIAN ANDERSON, CTW-6, MAJ TRAVIS WELLS, VT-10

On June 16, 2016, Commander Brian S. Anderton, USNR, a flight instructor with CTW-6 and Major Travis B. Wells, USMC, a flight instructor with VT-10 at Naval Air Station Pensacola, Fla. demonstrated outstanding situational awareness and exceptional crew resource management while executing a T-6A day training flight. While monitoring an airport common frequency, Commander Anderton and Major Wells overheard the pilot of a civilian aircraft request assistance assessing the status of his landing gear. The T-6A crew coordinated with the civilian pilot, flawlessly matched his configuration and airspeed, and joined in a cruise positon. As the T-6A crew approached the civilian aircraft, they noted the landing gear was only part way down. The civilian pilot subsequently executed an emergency manual landing gear extension. The T-6A crew confirmed the landing gear came all the way down and the civilian pilot safely landed his aircraft. Commander Anderton and Major Wells then completed their training mission. Commander Anderton and Major Wells' professionalism and flying skill prevented damage and injury to the civilian pilot and his aircraft.

BY LT MATT PETERSEN, LTJG BLAKE SMITH & PO3 RYAN MORINA, HSM-51

No Moon No Horizon No Instruments

The MH-60R can be described as a network of computers, with a helicopter built around them. On a midnight flight, we were going to find out what happened when those computers went haywire.

It was the third month of an extended FDNF cruise; it was my second time as a helicopter aircraft commander (HAC), and LTJG Blake Smith and PO3 Ryan Morina's nugget cruise. We had flown together as a crew dozens of times, and we were well-versed and comfortable flying together. This mission was looking to be an exciting night of searching our operating area for a contact of interest. As we got off deck, we realized it was also going to be a varsity night behind the boat. There was no moon, no horizon; a thick blanket of haze up through several thousand feet; and nothing to look at but green static through our night vision goggles.

Two hours into our event, with no joy so far, we found a radar contact that looked interesting. We were already 70 miles from our ship, with no diverts in the area. We pushed farther out to get eyes on. As we did, the computer popped a GPS unavailable advisory. A few minutes later came drift velocity miscompare and longitude miscompare. The aircraft was flying just fine – it's possible it was just software problems.

We had a bad feeling about it. We had never seen these two new advisories before. In fact, they weren't in the NATOPS pocket checklist, or even in the NATOPS manual. MH-60R software development outstripped NATOPS development, and it was not uncommon to see advisories in the aircraft that were not mentioned in the NATOPS manual. Thus far, they had been annoyances only; not safety-of-flight related. Although our aircraft seemed OK , we discussed our discomfort with a mysteriously degrading aircraft on a moonless night. We turned for home.

The soul of the MH-60R is the embedded GPS inertial navigation system (EGI). The two EGIs draw from onboard accelerometers as well as GPS, and feed the flight instruments and the automated flight control system, or AFCS. The AFCS keeps the aircraft spinning side up. If the EGIs lose touch with GPS, in theory, they will kick over to only the onboard gyros (INS) and continue to provide attitude instrument information to the pilots. Because there are two EGIs, a dual-EGI failure was considered unlikely, and we had never trained on it. A glass-cockpit aircraft, the MH-60 has only four analog back-up instruments, which are very rarely used.

These are a steam gauge altimeter, airspeed indicator, magnetic compass, and an attitude indicator the size of a wristwatch. We called the back-up attitude indicator the "peanut gyro" due to its size. When we lost EGIs and AFCS in IMC in the simulator, we typically departed controlled flight. The last time that we knew of a crew of an H-60 series aircraft losing their primary flight instruments at night, they didn't make it home.

We were 60 miles from the ship, headed home, when our EGIs bit the dust. Our primary attitude indicators processed, giving opposite readings on pitch and roll. Our heading indicators rotated unrealistically. Our vertical velocity indicators read substantial climbs and descents, even as the aircraft wallowed in level flight. The aircraft displayed a series of miscompare indications for almost every parameter of digital flight instrumentation. Our AFCS control panel spit out a slew of failures, and we felt the aircraft controls become squirrelly, with the nose wandering up and down in pitch and mucking about in roll. The GPS-derived groundspeed indication accelerated to 255 knots, a physical impossibility for this aircraft. Every malfunction was written across both the right and left seat flight displays.

While we wrestled with the aircraft, barely maintaining straight and level flight on the peanut gyro, we declared an emergency and attempted to troubleshoot the EGIs. Amazingly, both our EGIs were shown as fully functional. Without miscompares in NATOPS, we were drawing a blank for troubleshooting. We considered cycling our EGIs, but also saw that possibility as further degrading the aircraft, which still claimed to have good EGIs. As a crew, we quickly assessed our situation. What do we have that still works? The helicopter was still spinning side up. The engines were running. Trim seemed to work. Altitude and airspeed seemed to be valid. "Trust your

instruments" had been drilled into us a million times – but tonight, there were hardly any instruments that we could trust.

It became rapidly apparent we could focus on little else beyond flying the aircraft. The back-up instruments were mounted in the center of the cockpit, between the two pilots. In order to read them accurately, one had to lean inward, away from the vertical, essentially begging for vertigo. As we flew, the aircraft kept wandering off to the left. At first we thought this was part of the controllability problems, but we realized that as the left-seat pilot flew, leaning to the right to read the instruments, he was unconsciously rolling us back to the left, to level his vestibular plane.

We realized that we were getting close to falling down the rabbit hole of vertigo. We fought this by flying and reading instruments together, talking back and forth as we did. We weren't so much "flying pilot" and "monitoring pilot" any longer. Instead, we combined all of our inputs, corrections, and instrument readings together into one steady stream of communication. As one pilot moved the controls, the other read the instruments, calling for corrections and slight movements in a given direction. The magnetic compass tumbled every time we turned (think back to the good old T-34 sims) and we swagged rollout headings on turns. We talked to each other, continuously, for the next 45 minutes, and as we did we kept vertigo at bay.

Approaching the ship, we needed to descend to our landing pattern altitude. We stepped down, calling every 100 feet, stopping our descent in stages to ensure that we could recage when we pulled power. Every crew member was monitoring altitude, one pilot on the radar altitude (RADALT), the other on the barometric backup and aircrew member backing up RADALT, with the ship's onboard controller, OS2 Lamb , monitoring our descent via SPY radar. We found the ship visually as a speck in our NVGs at three nautical miles, but had to turn outbound to set up a shallow, extended final. We requested a clear-deck landing as we didn't feel that we had the controllability to fight for a trap over the deck.

Creeping toward the back of the ship, oscillating power and altitude as we did so, we had to fight off the black-hole illusion common to small deck landings, by talking back and forth to stay oriented and caged and to keep the aircraft under control. Our altitude fluctuated high enough to consider a wave off, but we had only been able to orient ourselves to the deck at 0.3 DME, and flying this approach again didn't seem worth the risk. We slid the aircraft back forward and down over the deck, inched into the circle, and set it down smoothly.

Post-mission reconstruction of the many sources of flight data provided by the MH-60R showed that GPS had rapidly cycled in and out several times, precipitating this event. Both of our EGIs reacted poorly and began generating incorrect outputs. The bad EGI data scrambled our flight instruments and the AFCS. As to why the EGIs didn't kick to INS as advertised, and what caused the initial GPS interruption? The jury's still out.

In the meantime, stay fluent in crew resource management and partial panel. It may save your life.

Sailors stand ready to launch an MH-60R Sea Hawk on the flight deck of aircraft carrier USS GEORGE WASHINGTON (CVN 73). (Photo by Petty Officer 2nd Class Chase C. Lacombe)

BY LCDR DEREK ASHLOCK, VFC-111

Too Hot to Handle

As a seasoned aviator, during Operation Desert Storm I had my fair share of emergencies. From losing an engine and performing a single-engine approach at the boat several times, to losing a leading edge flap inflight, I have an extensive experience dealing with situations outside the norm. Recently I encountered an event that quickly progressed from bad to worse.

I was leading a light division out of Key West (consisting of me in an F-5N and two Hawker Hunters on the 7 a.m. SFARP launch to act as red air strikers. Taking off from RW 32, power-up and wipe-out were normal and the ECS flow felt normal as did the temperature.

After a normal acceleration and takeoff —promptly as the gear came up and locked— and upon turning to our assigned heading, the ECS went past what I would consider normal full flow.

With the amount and velocity of the air coming out of the diffusers, I couldn't hear the radios. It was even more concerning that the temperature was something akin to a blowtorch and as if one wasn't enough, I immediately knew the combination of both was a serious situation. Initially trying to deflect the air blast coming from the right diffuser, the air was so hot that I could not hold my gloved hand over the airflow.

The outer control rings that meter airflow on the left canopy were literally too hot to touch so I could not turn them down or off, let alone divert their direction. I was amazed that flames were not accompanying the extraordinarily high temperature.

Mental note No. 1, "Golly, this is more serious than just hot air..."

Climbing through 1,500 feet armed with only my system knowledge because there is no procedure for this in NATOPS, I manually selected man cold to remove the auto temperature logic from the system. Knowing full well the advertised time required to effect change could be north of a minute, I gave it its due effort as much as I was able. After holding the toggle for 10 or 15 seconds with no change to flow or temperature, the heat building up in the cockpit was rapidly approaching unbearable. I abandoned this step and proceeded to my next course of action.

Mental note No. 2, "If RAM/DUMP doesn't work quickly, I'm going to have to jettison the canopy very, very soon..."

After reducing power, leveling at 2,500 feet and selecting RAM/DUMP on the pressurization switch, the amount and velocity of air coming through the system began to reduce but the temperature remained extremely hot. I could now hear the radio and I asked my Hawker Hunter wingman to back me up with my thought process as he was also qualified in the F-5N. He came back immediately with the same procedures I already had completed and that I was not trailing smoke or on fire. It was reassuring that I had acted properly and hadn't caused this myself or, even worse, forgot some simple step along the way. As mentioned before, there is no procedure in the F-5 NATOPS about runaway cockpit airflow/temperature.

With the airflow reduced and the temperature still hot but bearable, I passed the lead to the Hawker Hunter to press to the area and complete the red air presentation while I declared an emergency and coordinated my return to base with approach. I then spoke to my squadron ODO on AUX frequency who was brand new and on his first time on the desk. Confirming there was nothing in NATOPS to aid in my situation, I told him my game plan and then returned my attention to tower to alert them of my situation. I informed them of my problem and that I had it under control and would adjust my gross weight 5 miles south of the field. As the Tiger does not have a fuel dump system, I did a few afterburner 360s and landed with a 4.0 on the fuel on a 7,000 foot runway without issues.

Post-flight maintenance inspection discovered the bleed air regulator valve had failed to fully open, so full bleed air was coming into the cockpit directly from the engine. The extreme temperature of several hundred degrees and overwhelming velocity ultimately made sense.

So, what are my takeaways?

First, I have had my fair share of emergencies, but haven't had an emergency ramp up as fast to a near desperation level (consideration of jettisoning the canopy) in a matter of seconds before. The amount of airflow and heat was beyond my imagination. With no NATOPS procedures, only system knowledge that the RAM/DUMP switch would cease engine airflow to the cockpit and evacuate the extremely hot air aided me in handling this unique (to the F-5), situation.

Second, CRM was my friend. From communicating with my wingman for procedural backup and a visual inspection, to engaging our ODO to dig into NATOPS, to being directive with tower about my game plan, good crew resource management was a key factor in resolving this emergency in a safe, timely and efficient manner.

Lastly, with the historically volatile weather in the Florida Keys, I caught a break with basic VFR conditions. Had the weather been less than optimum, the attention that was required in the cockpit to battle the extreme heat could have led to disastrous results. Often, as naval aviators we launch in less than ideal weather conditions, hardly pausing at the thought that bad things could happen let alone happen in a rapid manner. I have run the scenario through my head in bad weather or at night, and am thankful to have had this emergency during daylight and VFR conditions.

A pilot flies an F-5N Tiger II. (Photo by Jose Ramos)

BY LT LINDSAY MCCAMMOND

CRISIS AVERTED

During CQ periods, VRC squadrons frequently receive multiple boat hits in a day to shuttle personnel on and off the carrier. Known as double shuttles, these missions result in longer crew days, but also provide a great platform for flight crew training and upgrade flights.

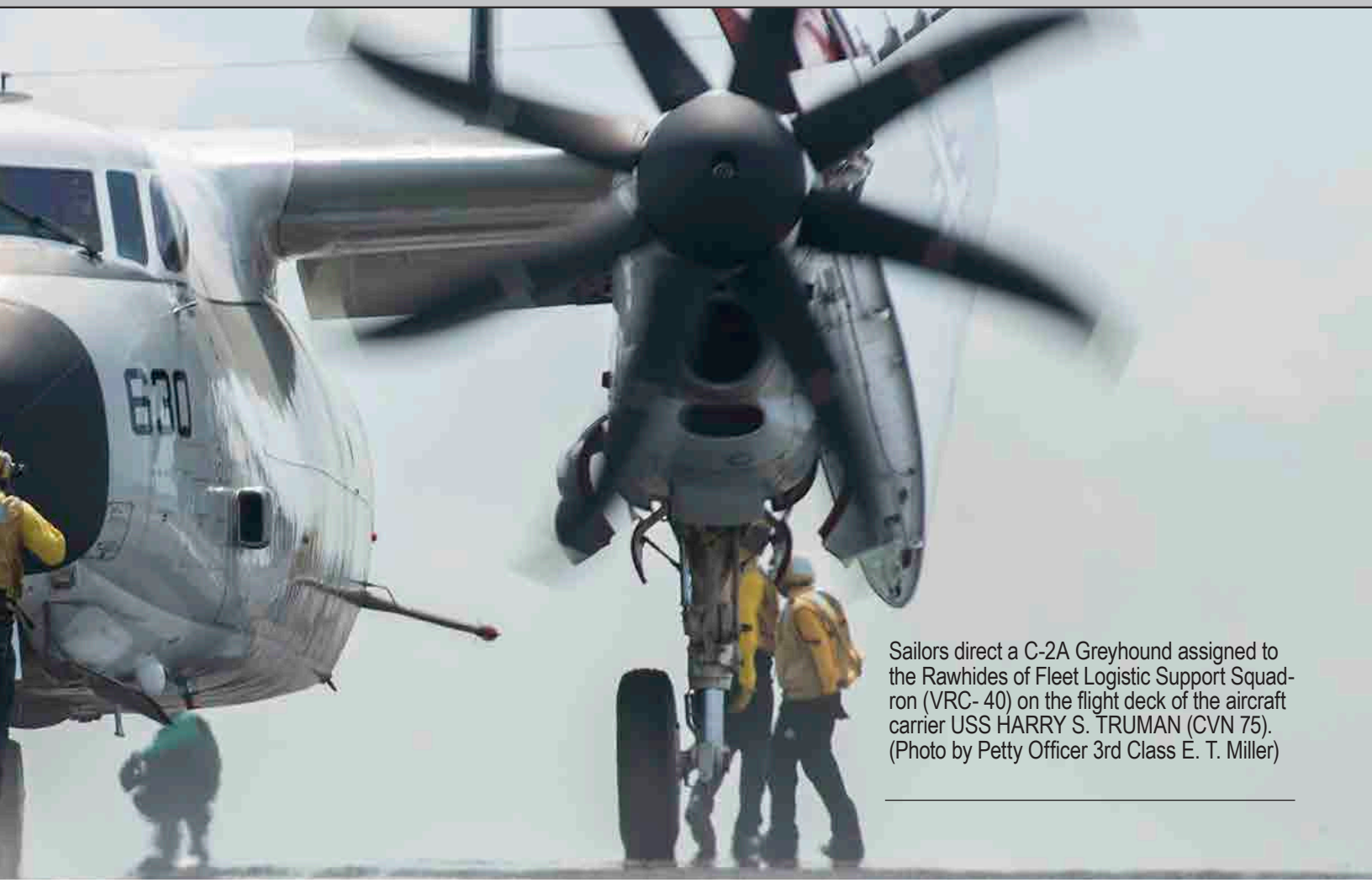
It was an early 4:30 a.m. brief for the first overhead of the day. Homeguard CVN operations during CQ periods off the coast of California generally consist of max passengers on with max exodus off. The crew of USS THEODORE ROOSEVELT (CVN 71) affectionately referred to it as "COD-A-PALOOZA." On the tail end of CVW CQ with two weeks at sea under their belts, so ensued COD-A-PALOOZA onto the flight deck. The CODs' mission was to rescue our battered Sailors from the clutches of Dave-Jones' locker, and take them back home to terra firma. Thank goodness it was "raining COD!"

The first flight was uneventful, as the crew of Password 25 successfully completed the first round of "rescue" missions to and from the carrier. At 9 a.m., applause was heard from the cabin passengers as they touched down in the land of sunshine.

Everything went according to the brief for the second flight as well. Password 25 trapped, sidelined to offload brave new warriors on their conquest against Poseidon and the arduous FRS CQ ahead, and then picked up the final group of passengers for the day. Standard turn-around on deck—everything from the on-load of passengers, safety brief, and inspection of harnesses and passengers — went seamlessly. In our community, it is imperative to the safety and success of the mission that the entire crew be strapped in and secure with all checks complete, save the cat extend, wings and flaps, prior to alerting the Air Boss we are up and ready as an aircraft. Heaven forbid, we taxi around and lose brakes close to the scupper railing or land an airplane on a foul deck, and end up overboard with individuals who aren't strapped in, making survivability much less likely. Imagine finding yourself overboard in the water with now no reference point to escape the first thing we aviators learn in the dunker is to always have a reference point, which is usually your seat. So, we do not rush as an aircrew team during checks, especially when entrusted with the lives of America's finest on board. Therefore checks are thorough, complete, and cabin-secure prior to our awaited go-fly signal to the flight deck.

With concurrence from the aircrew in the back, I gave the PC the "go-fly" sign. He proceeded to pass us off to our yellow shirt for the launch. He broke us down, put us on CAT extend, and completed our final checks as standardized. After a few minutes, we were taxied to the catapult.

Upon taxing past the JBD for CAT 2, the flight deck held us as CAT 2 got up and ready. We could see the shuttle retracting and I'm sure our tow link was being lowered. At this time, our aircrew was conducting a final look-around while strapped in. The youngest member of the team, a crew chief



Sailors direct a C-2A Greyhound assigned to the Rawhides of Fleet Logistic Support Squadron (VRC- 40) on the flight deck of the aircraft carrier USS HARRY S. TRUMAN (CVN 75). (Photo by Petty Officer 3rd Class E. T. Miller)

trainee, seated in the last row which stares down the ramp, noticed his neighbor was suspiciously and awkwardly holding onto his upper right restraint. He asked the CDR if anything was wrong, to which he responded with a no. Our trainee, skeptical of this answer and knowing the precariousness of a cat-shot while seated backwards, called his bluff and notified the cockpit that something was wrong and that he needed to get out of his seat. Coincidentally, it was also the same time that CAT 2 was ready for us, and we were signaled to taxi forward. I shook it off and signaled to the yellow shirt that we needed to hold our position. The yellow shirt seemed a little confused and slightly upset, so I immediately came over tower frequency alerting the Air Boss that we needed to hold our position in order to deal with an "undone" passenger.

After receiving confirmation from me that it was safe to get up and investigate, the aircrew discovered that one of the upper restraint straps was not properly fastened and had essentially come undone completely while strapping in. Instead of asking for help, the passenger planned on simply holding onto the strap during the catapult shot, which could have been catastrophic. For those unfamiliar with the C-2A cabin arrangements, our seats sit backwards to increase survivability in a hard landing or crash. The seats in this arrangement are graded to withstand 20Gs – making cat shots an extremely interesting experience for all. This passenger also happened to be seated directly in front of the ramp, where many a cell phone have shattered against while trying to take that perfectly unauthorized cat-shot selfie. Had the acceleration from zero to 130 knots end speed, expelled him from the seat, his battle scars would have consisted of some broken bones, most likely to the face with a probable concussion, while at worst may have caused death.

The a aircrew members fixed the upper restraint, helped the passenger get strapped in properly, took a quick look over the cabin, strapped in again, and away we went, slipping the surly bonds of the flight deck. A "COD-POCALYPSE" was averted.

It only takes a matter of seconds for a dangerous situation to develop and progress if situational awareness deteriorates, complacency creeps in, and good CRM is not practiced. If you see something out of the ordinary, speak up and rectify the situation. Having the courage to speak up and effectively executing sound CRM principles, such as communication and assertiveness, prevented a possible mishap.

If you feel something is wrong with your harness, speak up and ask; but don't arbitrarily walk about the cabin to get assistance. Tap the information up a row to the crew chiefs who can verbalize suspend to the cockpit whereby we can safely assist. As the face to and from the fleet, we do care and believe in customer service. While you do not have a choice in carrier providers, we are here to assist and provide you with one heck of a ride.

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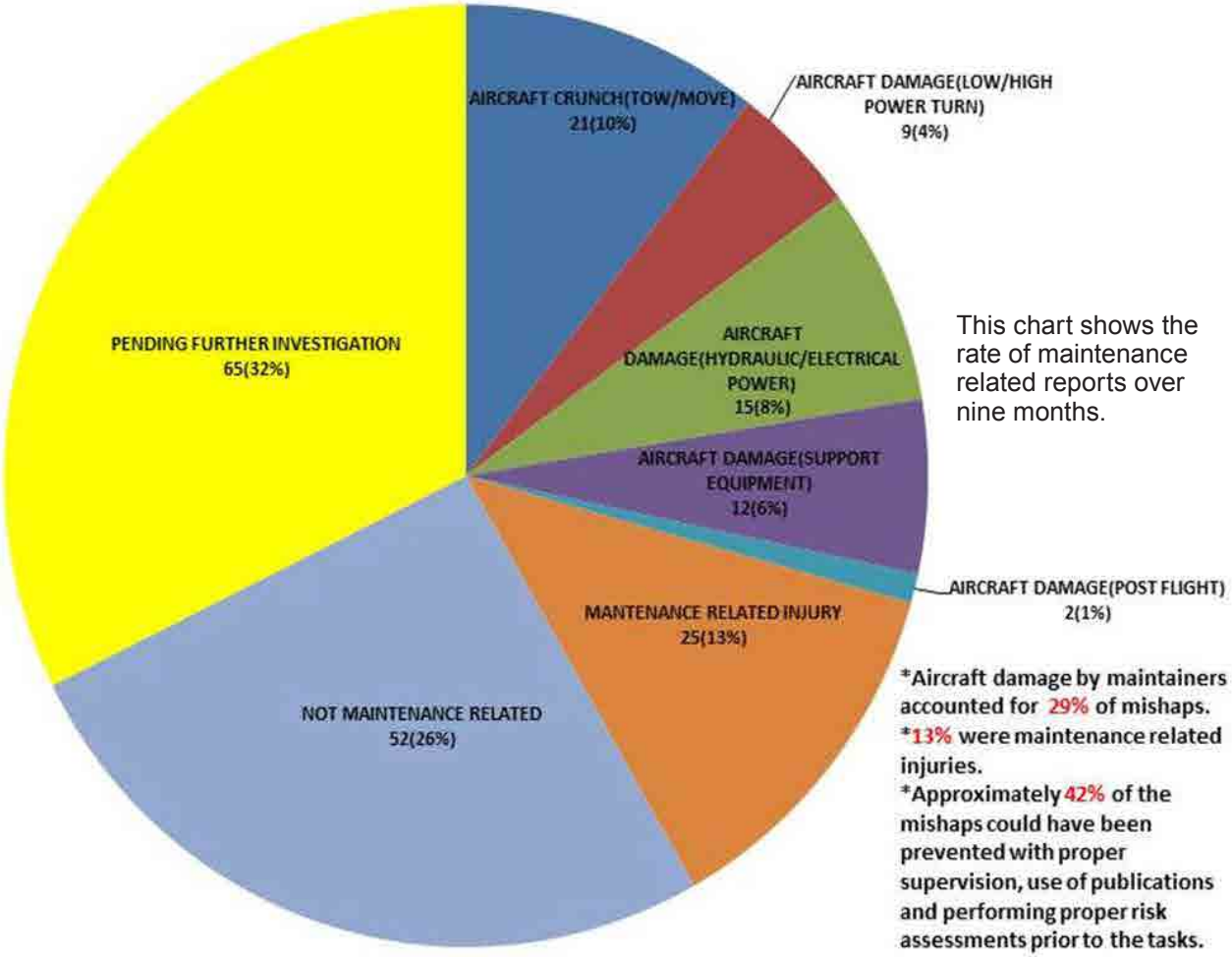
Maintenance Related Aircraft Damage and Maintenance Injuries



This chart shows the rate of maintenance related reports over nine months.

*Aircraft damage by maintainers accounted for 29% of mishaps.
*13% were maintenance related injuries.
*Approximately 42% of the mishaps could have been prevented with proper supervision, use of publications and performing proper risk assessments prior to the tasks.

11 Examples of Recent Maintenance Related Reports

1. C-2A: Binding flight controls on preflight due to improper bolt installation.

2. Afloat mishap: SVM's foot was inadvertently run over by a tow bar while working on the aircraft.

3. EA-18G: Maintainer lacerated eyebrow by walking into horizontal stab.

4. MH-60S: Sailor injured finger while conducting tail pylon fold as part daily inspection.

5. F/A-18E: Left and Right TEF Impacted doors 64L and 64R during ground low power turn.

6. F-35: Radome was damaged during towing.

7. F-35: Engine mount sustained damage during engine installation.

8. SVM was using soldering when solder debris entered the SVM's eye. SVM was not using required PPE at the time.

9. MQ-8B: Hangar bridge crane control arm impacted MQ-8B multiple times causing damage to the aircraft.

10. Fuel sprayed in maintainer's eyes during maintenance. Maintainer was not using required PPE at the time.

11. E-6B: Nosewheel collided with aircraft during nose gear swing.

MECH Bravo Zulu

Sailors and Marines Preventing Mishaps

PO3(AW) TXITXIMEE LEE, VFA-195

While conducting a pre-flight inspection on a F/A-18E Super Hornet, Petty Officer Third Class (AW) Txitximee Lee discovered a loose brake over temperature indicator on the starboard brake assembly of 407's port wing. She immediately initiated a foreign object debris (FOD) search in the vicinity of the aircraft, ensuring the area was clear of any additional FOD hazards. By identifying and removing the potential FOD hazard, Petty Officer Lee prevented an unsafe condition that could have resulted in aircraft damage. Her attention to detail and quick response averted a potential aircraft mishap and personnel injury. Her actions illustrate how every maintainer plays a crucial role in preserving life and equipment by preventing future mishap events.

PO1 EUGENE BUFFARD

While on detachment to Naval Air Station Fallon, Nev., after a fellow maintenance Sailor had received a severe electrical shock from aircraft 504's nose wheel grounding point with power applied from the ground power station. PO1 Buffard expertly troubleshot the ground power station and determined it had a faulty neutral grounding circuit. This previously undetected fault caused the aircraft structure to be part of the circuit and the grounding strap to transfer electrical current back to ground. His diligence and attention to detail not only prevented further shock hazards to VAQ-209 Star Warriors, but to future commands operating at NAS Fallon.

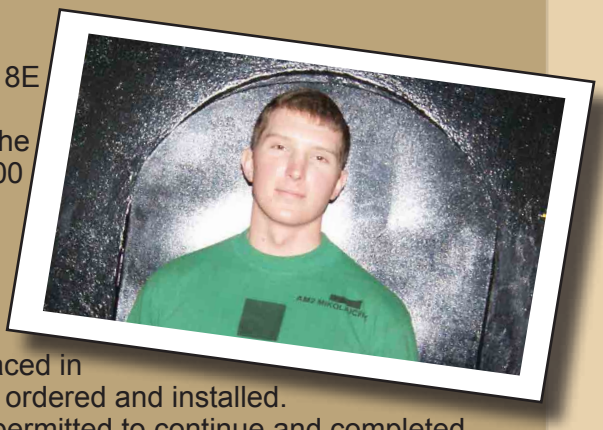
PO3(AW) KELSEY MCGLINCH, VFA-195

While conducting final checks on a F/A-18E Super Hornet prior to aircraft launch, Petty OfficerThird Class (AW) Kelsey McGlinch discovered a missing brake spacer in a padeye on deck under the aircraft 402's port wing. She immediately initiated a foreign object debris (FOD) search in the vicinity of the aircraft, ensuring the area was clear of any additional FOD hazards. By identifying and removing the potential FOD hazard, Petty Officer McGlinch prevented an unsafe condition that could have resulted in aircraft damage. Petty Officer McGlinch's attention to detail and quick response averted a potential aircraft mishap and personnel injury. Her actions illustrate how every maintainer plays a crucial role in preserving life and equipment by preventing future mishap events.

PO2 ERIC HUNTOON, VAW-116

PO2 Eric Huntoon displayed exceptional situational awareness while participating in flight deck operations. As "Sun King 603" launched, PO2 Huntoon noticed that the tail skid was not fully extended. Had the aircraft come around and taken a hard landing, this could have resulted in damage to the aircraft and injury to the aircrew. He quickly notified the flight deck coordinator, who notified squadron and ship personnel who prevented it from continuing CQ. The aircraft was then sent to its home base in Pt. Mugu, Calif., to be serviced. It was released safe for flight to continue with CQ the next day.

PO2 KENNETH MIKOLAICHIK, VFA-151



While conducting a phase alpha inspection on a VFA-151 F/A-18E Super Hornet, PO2 Mikolaichik was in the process of conducting the HS1 and HS2 hydraulic return hose assembly inspection. As he performed the HS1 portion of the inspection, prior to applying 5,000 psi to the system, he noticed a slight bulge on the top part of the return hose. Upon further inspection he realized the hose had an enormous swelling and would likely have ruptured had he applied pressure through the system. PO2 Mikolaichik quickly called vigilante maintenance control, informing them of the hydraulic return hose condition. As a result of his action, the aircraft was placed in a non-mission capable status and a new hydraulic return line was ordered and installed. With the replaced hydraulic line, the phase alpha inspection was permitted to continue and completed with no further incident. By performing a thorough in-depth inspection, PO2 Mikolaichik prevented a catastrophic mishap from happening. If not discovered prior to flight, the expansion of the hose could have caused it to burst, creating a complete loss of pressure to the HS1 primary hydraulic system and a loss of the designed redundancy of two hydraulic systems. Loss of this redundancy in flight increases the risk of experiencing a complete hydraulic failure. His meticulous step-by-step procedural compliance prevented a possible mishap or loss of life.

LCpl ANDREW FORBUS, SPMAGTF SC-16

While conducting final checks on a daily inspection on a SPMAGTF SC-16 CH-53E, LCpl Andrew Forbus discovered abnormal wear and fretting on both sides of the tail rotor disconnect after cleaning the grease out of aircraft 165651 (Modex 05). He immediately notified a flight line collateral duty inspector who then alerted the quality assurance division. Upon further inspection, using a method yet to be published by the engineers, the alignment of the tail rotor disconnect coupling was found to be out of limits, necessitating removal of the tail pylon for a planning & estimate (P&E) team rework. Had this easy-to-miss discrepancy gone undetected the aircraft could have had a tail rotor disconnect failure resulting in the loss of tail rotor drive in flight, potentially resulting in a Class A mishap. LCpl Forbus prevented a potential aircraft mishap and loss of life. His actions demonstrate the importance of every maintainer playing their crucial role in preserving life and equipment by preventing future mishaps.

↑ Airman Jasmine Yelberton performs maintenance on an M61A2 20mm machine gun for an F/A-18E Super Hornet assigned to the Top Hatters of Strike Fighter Squadron (VFA) 14. (Photo by Petty Officer 3rd Class Andre T. Richard)

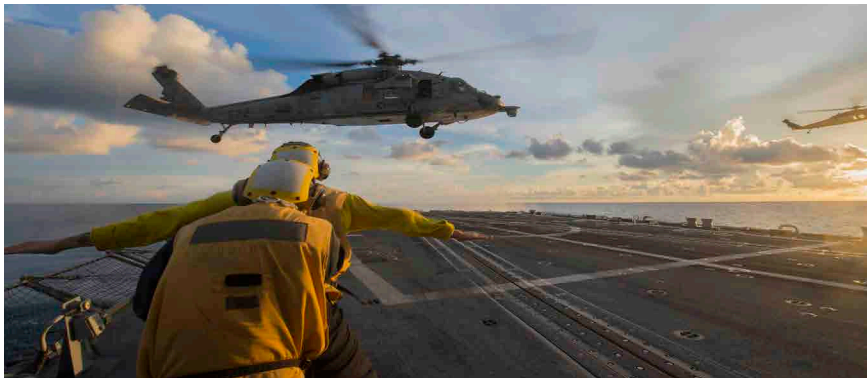
← Petty Officer 3rd Class Ashley Arns, left, and Petty Officer 1st Class Carlos Rodriguez, both assigned to the "Battle Cats" of Helicopter Maritime Strike Squadron (HSM) 73, performs maintenance on an MH-60R Sea Hawk helicopter. (Photo by Petty Officer 2nd Class Siobhana R. McEwen)

↓ Petty Officer 3rd Class Matthew Fitzgerald directs Petty Officer Willie-Earl Reed while towing an F/A-18E Super Hornet aboard the USS JOHN C. STENNIS (CVN 74) flight deck. (Photo by Petty Officer 3rd Class Kenneth Rodriguez Santiago)

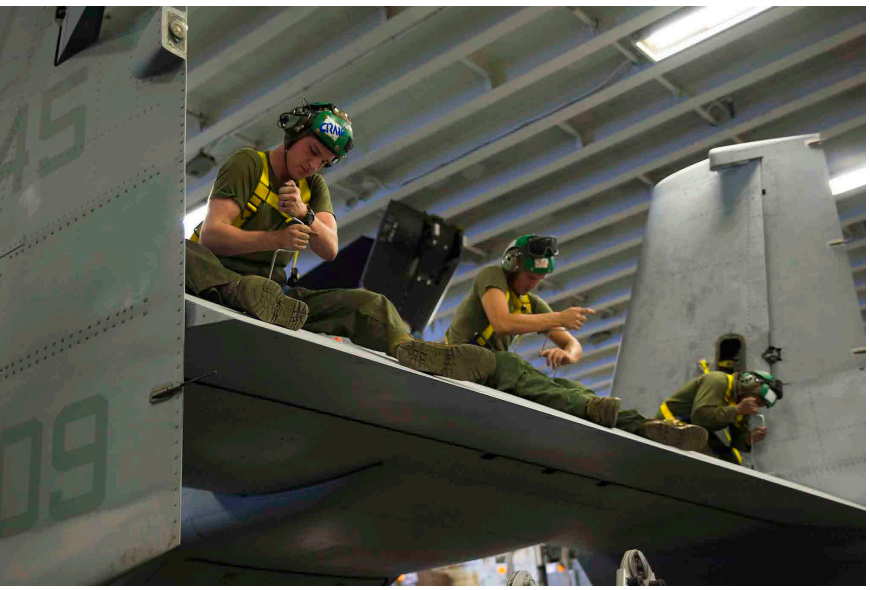
↑ Petty Officer 1st Class Jeremy Parrish directs an F/A-18E Super Hornet on the flight deck of the aircraft carrier USS DWIGHT D. EISENHOWER (CVN 69). (Photo by Petty Officer 3rd Class Anderson W. Branch)

← Sailors load ordnance into an F/A-18E Super Hornet on the flight deck of the aircraft carrier USS DWIGHT D. EISENHOWER (CVN 69). (Photo by Petty Officer 3rd Class Nathan T. Beard)

Maintainers in the Trenches



↑ Sailors signal to an MH-60S Sea Hawk helicopter as it hovers over the flight deck of the Arleigh-Burke-class guided-missile destroyer USS MCCAMPBELL (DDG 85). (Photo by Petty Officer 3rd Class Elesia K. Patten)



Marines tighten screws on an MV-22B Osprey aboard the amphibious assault ship USS WASP (LHD 1). (Photo by Petty Officer 2nd Class Nathan Wilkes)

↓ Commander Adrian Calder, commanding officer of the "Royal Maces" of Strike Fighter Squadron (VFA 27) , performs a pre-flight inspection on his F/A-18E Super Hornet on the flight deck of the USS RONALD REGAN (CVN 76). (Photo by Seaman Jamaal Liddell)

Back to the Basics By MGySgt William Potts

In the military, some of the best stories begin with, "So there I was." This is not one of those stories. I have just finished my first nine months of performing safety assessments as part of the Naval Safety Center team. From my perspective of 27 years as a maintenance professional, I have observed a lot of the same manning and logistical issues: not enough parts and not enough experienced personnel as we are still seeing on a routine basis in the fleet. What sets one squadron apart from another however, is not what they have but how they deal with similar concerns and issues shared by all. In general, all of our mishaps are related in one aspect; the failure to supervise at some level. It sounds like somewhat of a cliché but, what does it really mean to supervise? According to the dictionary, it means to oversee activity or task being carried out by somebody and to ensure that it is performed correctly.

As leaders, we realize that we can't be everywhere all the time, but we are all supervisors on some level regardless of rank or arbitrary title at all times. In order to supervise, one has to be an active, integral part of everything that is going on around them. This requires us to get out from behind the desk, be engaged in mitigating the risks, and getting back to the basics of maintenance practices. Supervision and initiative from the most junior maintainer to the most senior pilot will go a long way in reducing our mishaps. Engage and empower. We need to make "So there I was" a thing of the past!

Challenges of ALSS Assets By CPO Tom West

In my year at the Naval Safety Center, I have assessed more than 50 Navy and Marine Corps units comprised of almost every type model series (T/M/S) aircraft in inventory ranging from the P-3 Orion to the new Joint Strike Fighter. The PRs and Marine 6048s ("Flight E's") are working hard to keep up with the everyday challenges like supply shortages of aircrew flight gear and new maintenance requirements for aviation life support system (ALSS) equipment. It is important for you as the ALSS shop to stay in direct communication with supply and stay on top of turnaround times and availability of gear to meet the high demands of aircrew training.

During assessment visits, there are instances observed where aircrew personnel arrived to their deployable units without all the required gear to support daily flight operations. When this happens, there is a process in place for tracking fleet replacement squadron supply document numbers by naval message to alert the gaining activity that aircrew will arrive without the proper ALSS equipment. This communication process is critical so we do not lose track of document numbers and other pertinent information required by the gaining command.

Another safety concern we have observed is that pre-and post-flight inspections are not being performed on flight gear before and after use. Though seemingly minor, this is malpractice and leads to unaccounted FOD in aircraft, unreported maintenance requirements on ALSS gear, and reduces familiarity with the operation and effectiveness of the gear. Ultimately, this practice could lead to the loss of aircrew and aircraft assets.

The General NATOPS manual, OPNAVINST 3710.7U and the NA 13-1-6 (series) maintenance manuals provide specific guidance on performing pre-and-post flight inspections on issued flight equipment. A "best practice" we have noticed is that several Navy and Marine units have developed locally generated spreadsheets and logbooks that pull information from the NA 13-1-6 (series) and NAVAIR 00-80T-123 to aid the aircrew in the completion of the inspections. Please don't hesitate to contact us if you have any questions.

ORM - Every Day is a Training Day

By SCPO Elmer Bagtas

My time at the Naval Safety Center has given me the privilege of observing maintenance practices performed on all the various (T/M/S) aircraft currently used in the Navy and Marine Corps. While conducting safety assessments, I have seen some of the best and worst practices the fleet has to offer when it comes to managing our programs and maintenance standards. One common observation is a lack of understanding of time critical risk management (TCRM) by our maintainers. When an assessment team talks with maintenance personnel in the fleet, we ask, "What are the basic steps of operational risk management (ORM) and TCRM?", and "How do you feel it applies to you while conducting maintenance?"

Most people know what ORM stands for, and some of them might know steps in the process, but few can actually explain how using ORM and TCRM can benefit them on a daily basis. This process has been around since 1994 and it works! It is a way of thinking that can control hazards, keep our people safe, keep our aircraft flying, and actually improve our maintenance processes if used properly.

I suggest maintainers train like aircrew. Aircrew understands ORM and they use it. In fact, they embrace it. Discuss ORM and TCRM in your maintenance activities. Train on it every day. As maintenance professionals, sit down after completing major maintenance tasks, or even minor events, and debrief how things went in order to capture what worked and what didn't work. This is a simple way to change culture to prevent mishaps and improve day to day performance. TCRM and ORM work – try it and you will see.

"Back to the Basics with CTPL"

By MSgt Theophilus Thomas

During recent safety assessments, we discovered that there are a large number of centralized technical publication librarians who are unaware of many of the fundamental requirements governing the centralized technical publication library (CTPL) program. The NAVAIR 00-25-100 provides basic procedural practices to maintain proper program management. Upon taking ownership of the command's library, every CTPL program manager must first become familiar with the roles and responsibilities regarding the assignment. These responsibilities are found in work package 011 00 page 4 paragraph 9-1 of the 00-25-100, as well as in COMNAVAIRPAC Aviation Maintenance Advisories (AMAs) that are applicable to this program.

Upon setting up the library, upkeep is relatively simple. The electronic library management system (ELMS), which is available on the NATEC website, will analyze your library for currency and produce a readily available list of out-of-date manuals in your inventory. The NA 00-25-100 gives guidance on the frequency to self-initiate your electronic library audit. This function is recommended to be accomplished daily; however, it is mandatory to be accomplished weekly in order to keep the library current and manageable. Click on the "library audit", select a "database query option" then click "submit". This creates a search result containing records matching the query option selected and facilitates rapid publication updates.

Another area often found to be in error, is the management and control of "partial" or "reproduction" publications. The NAVAIR 00-25-100 references the proper procedures used to govern the use of and replication of manuals. Work package 013 00, paragraph 17-1, covers the requirements for the replicated material as well as the correct management techniques.

Additional tips and reference materials are located on the Naval Safety Center's web page: http://www.public.navy.mil/navsafecen/Pages/aviation/maintenance/AvnMntBstPrac.aspx

BY PO2 KARLAN ALEXANDER, VAQ-131

When Checklists Don't Match

What do you do when the checklist does not match how you have done the job in the past? While acting as the CDI during a stab spindle re-torque on an EA-18G Growler, I chose to follow my previous experience. A sickening pop and significant damage to the jet proved that I chose wrong.

My night started out like any other. As shift supervisor, I checked tools, received a pass down from our LPO and went to a maintenance meeting. Phase maintenance on aircraft 503 was finally wrapping up. For airframes, that meant completing stab spindle re-torques of panels 73 left and right. While still new to the EA-18G, I considered panel installation a routine procedure.

Based on my training, however, I felt that the interactive electronic technical manual (IETM) procedures were inadequate. It was my understanding that the IETMs did not keep the stabs from blocking access to the panel screw locations. Due to these perceived shortcomings, I did not reference the IETM throughout the evolution, a lapse that would have consequences later on.

Once we started working on the jet, another petty officer slid the panels under the horizontal stabs and installed every screw except for the eight covered by the stabs. I decided that we would install the remaining screws by applying external hydraulic power to HS1 and HS2 and that I would sit in the cockpit to move the control stick and deflect the stabs. I needed to move the stick completely forward and completely aft to move the stabs out of the way so that we could install the remaining screws. I decided not to cut power during the procedure, as called for in IETM. Experience taught me that the stabs would move back to the streamline position before we had time to install all the remaining screws.

We took our places around the aircraft. With operators on the hydraulic power generators (one person staged to install screws) and me in the cockpit, we applied hydraulic power. I moved the stick forward, providing access to the lower forward screws for each panel. The petty officer installing the screws soon came out from beneath the aircraft and signaled to me that he was complete.

I moved the stick aft and he repeated the process to install the lower aft screws on each side. He then moved to the top of the aircraft to install the remaining upper screws. I moved the stick forward and he installed one screw in the aft hole of 73 right and then repeated the process on the port side.

As we worked through the install, a second petty officer walked out into the hangar and looked to pitch in. If she acted as a safety observer, the petty officer screwing down the panels could stay where he was and she could signal to me when I was cleared to deflect the stab. Unfortunately, I did not think to brief her on the progress of the job, potential danger areas, or anything else. Still, what could go wrong?

We found out soon enough. The petty officer was acting as the safety observer and signaled to me that the aft screws were installed, prompting me to release the stick. I heard a loud pop and signaled the hydraulic generator operators to secure power.

Once out of the cockpit and on the ground, I understood what had made the popping noise. The petty officer responsible for securing each fastener hadn't completely installed the port side screw. When I released the stick, the stab moved into the screw causing it to pull out of the anchor nut.

The resulting non-destructive inspection identified damage to both the stab and panel 73 left that could not be repaired at the squadron level. The squadron was down a stab and there was absolutely nothing we could do to fix it. The only thing we could do was play musical stabs and panels to complete the phase.

During the investigation, I learned that there were amplifying remarks for the maintenance procedures in the IETM when installing panels 73 left and right. They involved placing the hydraulic generators in "aircraft mode" and removing both hydraulic and electrical power after repositioning the stabs. "Aircraft mode" would have prevented the stabs from moving too quickly and would have given us time to install the remaining screws. Following the procedure also would have eliminated the possibility of damage or injury.

After the dust had settled, I thought through other ways I could have prevented this mishap. Placing myself in the cockpit meant that I was unable to control the situation or inspect the work, unacceptable conditions for a CDI. A quick phone call to our local NATEC representatives would have clarified the procedure and explained why the hydraulic generator setting mattered.

Finally, fully briefing my plan to complete the job and taking an additional minute to discuss my plan with the newly arrived safety observer would have mitigated the risk. Finally, we were lucky that the petty officer installing the screws got out of the way when the stab started to fair. We had damaged the jet and very nearly injured a squadron mate.

The mistakes I made that night caused a mishap costing the Navy valuable parts and work center man-hours, as well as the suspension of my CDI qualification. However, I also learned many lessons that night. Most importantly, always read maintenance procedures in their entirety. Don't just skim through! Had I done this, we would have done maintenance the right way and not jeopardized the safety of my squadron mates and the condition of our aircraft. Remember, there are no dumb questions. If you don't understand something in a procedure, ask the question. We will occasionally make mistakes, but as long as you follow the proper steps you are always in the right.

BY PO3 JOSHUA HARRIS, VFA 81

The Dangers of Cutting Corners

Sailors connect the barricade to its station during a flight deck drill on the USS ENTERPRISE (CVN 65). (Photo by Petty Officer 3rd Class McKinley Cartwright)

Five months removed from a 10-month combat deployment in support of Operation Inherent Resolve, the VFA-81 Sunliners had finally gotten back into the swing of normal operations at Naval Air Station (NAS) Oceana. Everything was looking good, FOD walk-down was complete, aircraft were inspected and the flight schedule started without a hitch. Unfortunately, Sunliners aircraft 204 would recover from its flight with a nonfunctional battery gauge.

Since the proper battery voltage could not be determined due to a faulty gauge, aircraft 204 was taken off the flight schedule and Maintenance Control requested the aviation electrician's (AE) work center to troubleshoot. My leading petty officer (LPO) and another petty officer third class (PO3) went to the flight line to perform the pre-operational inspection on the A/M32A-108 mobile electric power plant while a second PO3 opened the interactive electronic technical manual (IETM) to start looking at the troubleshooting steps for this discrepancy.

Meanwhile, I had just finished launching an aircraft as a plane captain and was walking back into the hangar when I noticed my shop working on aircraft 204. I made my way over to the aircraft as another PO3 was plugging the power cord from the power cart into the aircraft. After plugging in the power cord, he started the power cart while the other PO3 climbed up the ladder and got into the cockpit. This is when my day took a turn for the worse.

After the power cart was started, the first PO3 went to the other side of the aircraft and started the troubleshooting procedures in accordance with IETM. I, on the other hand, stayed by the ladder and was told that there was still no power available to the aircraft from the power cart. Occasionally, the power cord does not fully seat in the aircraft receptacle and requires some adjusting. At this point, I made a horrible mistake and reached up to adjust the power cord without securing the power cart; an act IETM specifically warns against. The "external electrical power section of IETM states "not to handle external power cable assembly with external power applied." As one might imagine, as soon as I moved the power cord, it shorted out resulting in a loud "pop", a flash of white light, and a plume of black smoke. After I recovered from the initial shock of the arc flash, I looked down at my hands to see that they were black and red with electrical burns.

My LPO immediately secured the power cart and brought me inside to send me over to Medical. The flight surgeon looked at my hands and could not determine whether or not I had underlying damage to my skin. My hands were bandaged and I was referred to a plastic surgeon at Naval Medical Center Portsmouth, Va. I was diagnosed with second degree burns on multiple fingers but was lucky to not have sustained any permanent damage.

It has been several weeks since the incident occurred and my hands are still red from the burns. During these past few weeks, I had time to reflect on the entire incident and come up with a few important lessons learned. Foremost, you should never touch anything that has electrical power flowing through it. The power cart that we were using supplies 400 VAC power, which could have easily killed me. Second, don't assume that your equipment is safe at all times. The power cart pre-operational checklist requires all cables to be inspected for breaks, cracks, cuts, and distortions, which was conducted earlier that morning where nothing out of the ordinary was found.

Lastly, I learned that operational risk management (ORM) should be involved in every step of every action. I did not put much thought into adjusting the power cord and I assumed it would be safe to do. Had I stopped and thought about the situation for a moment, I would have been able to identify a glaring risk and implement the proper risk controls.

Aviation Mechanic's Creed

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

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

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

MECH

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RDML Christopher J. Murray, Commander, Naval Safety Center
Col Matthew Mowery, USMC, Deputy Commander
Maggie Menzies, Department Head, Media and Public Affairs
Naval Safety Center (757) 444-3520 (DSN 564)
(Dial the following extensions any time during the greeting to reach the desired person.)
Publications Fax (757) 444-6791
Report a Mishap (757) 444-2929 (DSN 564)

Approach-MECH Staff

Nika Glover, Editor-in-Chief juanika.glover@navy.mil, Ext. 7257
John Williams, Visual Information john.w.williams1@navy.mil, Ext. 7254
Allan Amen, Visual Information allan.amen@navy.mil, Ext. 7248

Aircraft Maintenance and Material Division Head

CDR Tom Gibbons, thomas.l.gibbons@navy.mil Ext. 7265

Avionics/ALSS Branch Head

CW05 Daniel Kissel, daniel.kissel@navy.mil Ext. 7285

Aircraft Maintenance Branch Head

CWO3 Charles Clay, charles.clay@navy.mil Ext 7258

Group Ring

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.Approach (ISSN 1094-0405) is published bimonthly by Commander, Naval Safety Center, 375 A Street Norfolk, VA 23511-4399, 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. Approach is available for sale by the Superintendent of Documents, P.O. Box 979050, St Louis, MO 63197-9000, or online at: bookstore.gpo.gov. Telephone credit card orders can be made 8 a.m. to 4 p.m. Eastern time at (866) 512-1800.Periodicals postage paid at Norfolk, Va., and additional mailing offices.

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Norfolk, VA 23511-4399
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MECH

On the cover: Aviation Structural Mechanic Airman Jorge Preciano, from Las Vegas, transports a C2-A Greyhound landing gear tire. (Photo by Petty Officer 3rd Class Anderson W. Branch)

Bravo Zulu Submission Guidelines

Include a smooth narrative of the event, names and ranks of the nominees, and endorsements from the command safety officer and CO.

Approach and Mech BZs must include endorsements from squadron CO and appropriate wing or MAG CO.

Send an action photo of the candidate(s) on the job or crew with the nominee(s) identified in the photo. Photos must be high-res (300 dpi), saved as a JPG. A phone number should also be included.

We cannot work the BZ until we have all these "pieces." Forgetting the chops delays processing the nomination and its publication.

MECH