The Navy & Marine Corps Aviation Maintenance Safety Magazine

Mech

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RADM Arthur Johnson **Commander, Naval Safety Center**
Col. Mark W. Erb, USMC **Deputy Commander**
John Mahoney **Head, Communications and Marketing**
Naval Safety Center (757) 444-3520 (DSN 564) Dial the following extensions any time during the greeting
Publications Fax (757) 444-6791

Mech Staff

Lt. David Robb **Editor**
david.c.robb@navy.mil Ext. 7220
Derek Nelson **Editor-in-Chief**
derek.nelson@navy.mil Ext. 7243
Allan Amen **Art Director**
allan.amen@navy.mil Ext. 7248
John Williams **Graphic Artist**
john.w.williams1@navy.mil Ext. 7254
Whitney Chambers **Graphics**
whitney.chambers@navy.mil Ext. 7248

Analysts

Cdr. David Peacott **Aircraft Maintenance and Material Division Head**
david.w.peacott@navy.mil Ext. 7265
Maj. Anthony Frost **Asst. Division Head**
anthony.frost@navy.mil Ext. 7223
AFCM Kevin Wilhelm **Maintenance Master Chief**
kevin.p.wilhelm@navy.mil Ext. 7269
MGySgt. Arthur Hagans **Avionics/QA**
arthur.hagans@navy.mil **Ext. 7276**
CWO3 S. T. Cruzpena **Aircraft Maintenance Branch Head**
sigfrido.cruzpena@navy.mil Ext. 7258
GySgt. Edward Rivera **Airframes/Hydraulic**
edward.rivera2@navy.mil Ext. 7285
AMCS Raymond Nichols **Airframes/Hydraulic/QA**
raymond.nichols@navy.mil Ext. 7293
ADCS Ron Taylor **Power Plants**
ronald.e.taylor@navy.mil **Ext. 7221**
ADCS Charles Clay **Power Plants**
charles.clay@navy.mil Ext. 7218
GySgt. John Hess **Power Plants**
john.hess3@navy.mil Ext. 7190
ASCS Mark Tangney **Support Equipment**
mark.tangney@navy.mil Ext. 7239
CWO5 Ron Stebbins **Avionics/ALSS/Analyst Branch Head**
ronald.stebbins@navy.mil Ext. 7278
GySgt. Robert Linn **Logs and Records/TD/CTPL**
robert.m.linn@navy.mil Ext. 7074
AZC Gainer Clark **Logs and Records/TD/CTPL**
gainer.clark@navy.mil Ext. 7812
ATCS Thomas Crook **Avionics**
thomas.crook@navy.mil Ext. 7280
MSgt. Michael Austin **Avionics/QA**
michael.z.austin@navy.mil Ext. 7256
AMEC Eric Wickham **Egress/Environmental**
eric.wickham@navy.mil Ext. 7292
PRCS Rich Young **ALSS/Aircrew Equipment**
richard.a.young1@navy.mil Ext. 7219
AEC James Esslinger **Electrical Systems**
james.esslinger@navy.mil Ext. 7291
AOCM Craig Trute **Ordnance**
craig.trute@navy.mil Ext. 7171

Mishaps cost time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help make sure that personnel can devote their time and energy to the mission. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is hazardous; the time to learn to do a job right is before combat starts.

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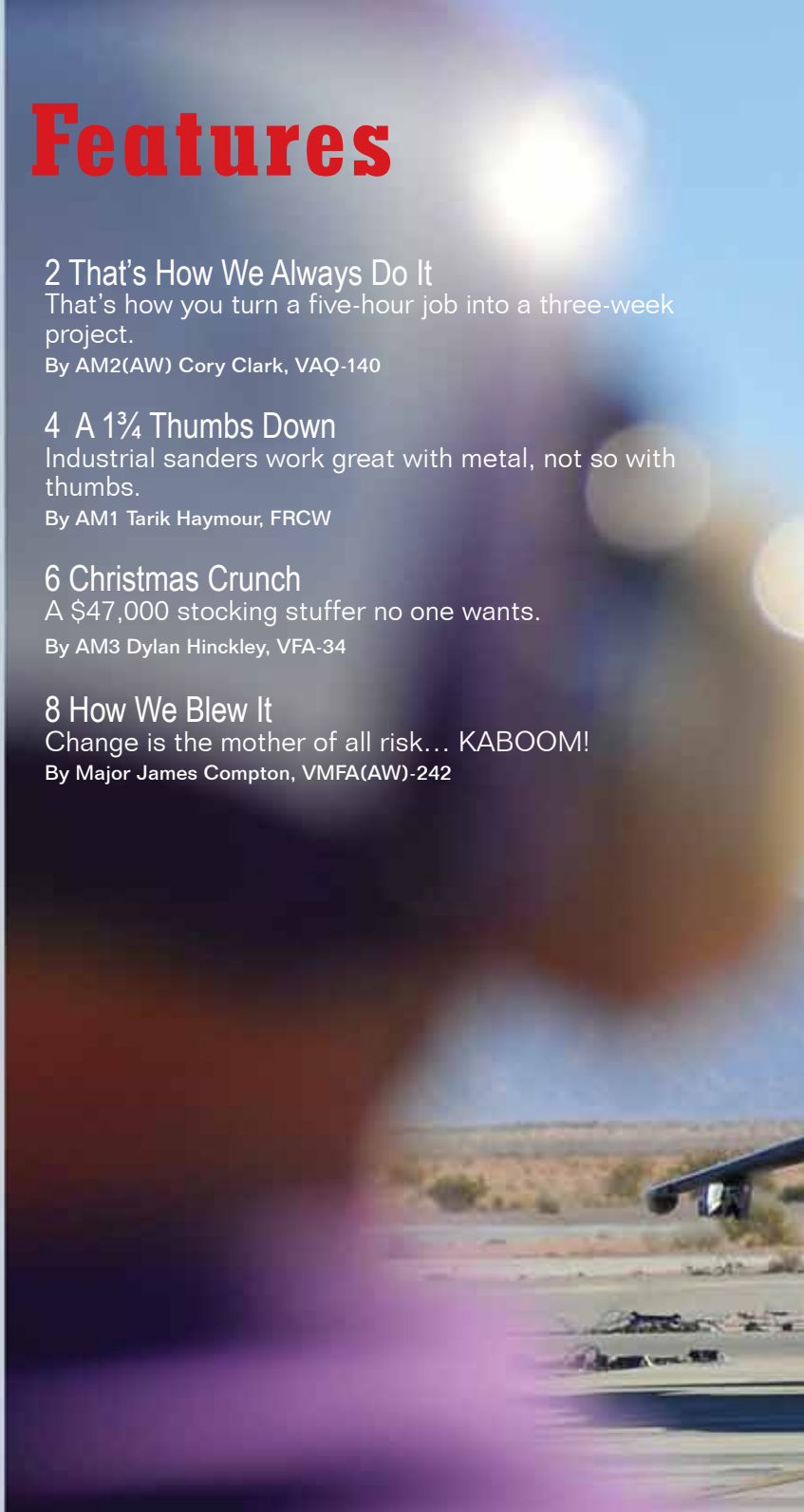
Features



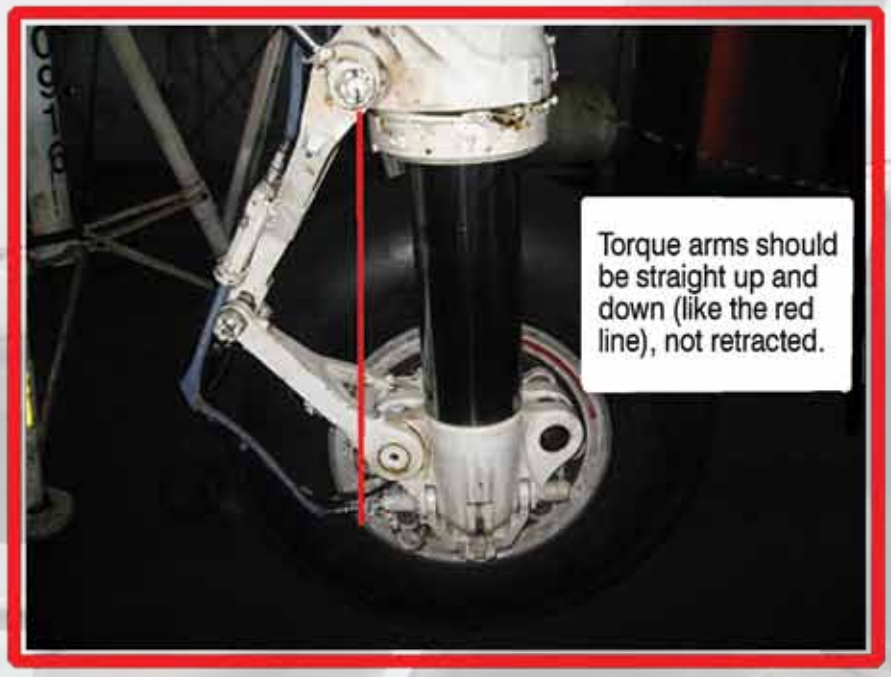
Navy flight-deck crewmen from USS *Green Bay* (LPD-20) observe as an AV-8B taxis to be refueled at an auxiliary airfield near MCAS Yuma. Marine Corps photo by LCpl. Austin Hazard.

Departments

Front cover: ADAN Trenton Warren does postflight checks in the cockpit of an MH-60S aboard USS *John C. Stennis* (CVN-74). Navy photo by MC3 Walter Wayman.

Background photo by PHAN Mark Rebilas

That's How We Always Do It



By AM2(AW) Cory Clark

My eye-opening lesson on why following the MIMs is important happened during a phase inspection on Stinger 500. After completing the tedious hydraulic servicing of the main-landing-gear, we prepared to service the pneumatics with dry nitrogen. This step of the 300-hour inspection requires the MIM, phase cards, one person per landing gear, a jenny operator, and an airframes technician in the cockpit. As the CDI, I made sure that everyone involved was qualified and ready to safely complete the task.

According to the MIM, you're supposed to use a 0-400 psi gauge on the strut servicing equipment. However, the only gauge the work center had was a 0-4000 psi one.

My eagerness to complete the task led me to improvise and deviate from the MIM. Our A/M26U-4B nitrogen cart had a low-pressure gauge, and I decided to use it. I regulated the nitrogen cart to 300 psi and used the 0-4000 psi gauge to the best of my ability. I serviced the strut to what I "thought" was 150 psi and then began op-checking the landing gear.

The normal operational check worked 4.0. The crew moved on to their assigned posts for the emergency-mode check, and the signal to lower the landing-gear handle was given to the technician in the cockpit.

As soon as the handle was lowered, we heard a loud popping noise from the starboard strut. I saw the starboard strut was now sitting about five inches higher than normal—a clear indication of a severe malfunction. Upon closer inspection, we discovered that the shrink rod behind the strut body had snapped in half and had wedged between the retract actuator and the strut.

Over the course of the next few days, QA led a thorough investigation to figure out what had happened. In a nutshell, because we had used an incorrect gauge, we had over-pressurized the system.

The investigation also revealed that I had not read far enough into the MIM and had missed an important note:

"If shock struts are pressurized with the aircraft on jacks, the strut inflation pressure must be re-checked with the aircraft off jacks, and strut pressure adjusted in accordance with name and identification plate."


Sheared shrink link idler arm.

This step ensures that the pressure inside the strut meets specific requirements and is not over-serviced. This was something I had never seen anyone do prior to an operational check of the gear during a phase alpha inspection (we had always done this step after op-checking the landing gear).

A "that's how we always do it" mentality turned a five-hour job into a three-week project. We ended up replacing the entire strut-assembly at a high cost to the squadron in both dollars and man hours.

Petty Officer Clark is the airframes day-check supervisor at VAQ-140.


Shrink chamber black pointer display arm should be rigged inside black tab (on the right).

A 1¾ Thumbs Down

By AM1 Tarik Haymour

It all began one afternoon shortly after eating lunch. My work center's workload was at a minimum, and I was doing a little housekeeping around the shop. I noticed a thing or two that could be improved with some easy metal-fabrication work. Since I work in Fleet Readiness Center West's (FRCW) 500-division, I had access to plenty of materials and an in-house metal shop. I went to airframes and told the shop supervisor that I wanted to fabricate a bracket. I checked out the required PPE and was on my way.

Digging through the scrap bin, I found a piece of metal that would do for my project. I cut it to size on the metal shear. Then I moved to the industrial rotary sander to grind down the metal's edges prior to fabricating it.

I did a visual scan of the sander and didn't notice anything out of place. I turned on the main power-supply and powered up the machine. As soon as I placed the piece of metal on the sanding disk, my hand was caught in what felt like a bear trap.

The piece of metal had snapped upward and had wedged itself between the guard and the rotating sanding disk. The tip of my right thumb was lopped off instantly, leaving a mess of torn flesh and exposed bone. I knew I had to stay calm, but even so, the words out of my mouth at the time mostly were expletives. I shut down the machine, applied pressure to my thumb, and yelled to the other shop personnel. I knew what came next—a pride-swallowing ambulance ride to the hospital.

What started out as a 10-to-15-minute project ended with several hours of surgery. I can't say there is a happy end to this story; thumbs don't grow back. The rotary sander, like so many other industrial tools, is not a forgiving piece of equipment. They destroy bone and tear skin before you know you've made a mistake. I had worn my PPE but failed to do a good pre-op check.

If I had, I would have noticed that the sanding disk had just been

The piece of metal had snapped upward and had wedged itself between the guard and the rotating sanding disk.

replaced with a new 50-grit disk. Also, I would have found that the guard had been adjusted to nearly the same thickness as the metal I was grinding. According to the operations manual, the guard should have been set an eighth of an inch from the sanding disk.

No matter how familiar I am with a piece of equipment, I will no longer let myself get too comfortable with it. I rate myself 1¾ thumbs down for this project gone wrong.

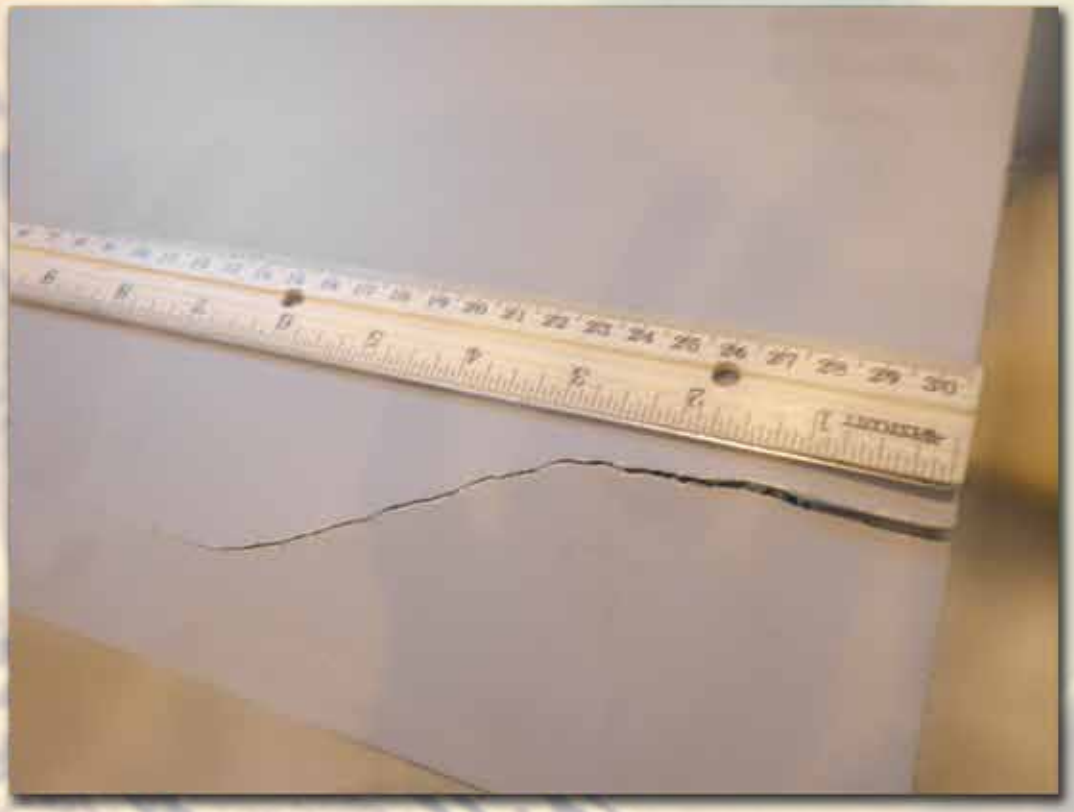
Petty Officer Haymour works in the 500 division at FRCW, NAS Lemoore.

Christmas Crunch

By AM3 Dylan Hinckley

Thursday was my last work day before taking Christmas leave. As the day finally ended, I headed home right after duty-section muster, excited about the upcoming time off. At home, I settled in for what I hoped would be a relaxing evening with my wife. We were about halfway through a movie when the ASDO called.

He told me that I had to come in because one of the jets we had parked in the hangar had started leaking fuel. All of its fuel



tanks had been topped off earlier that day when it was outside. After it had been moved into the hangar, the fuel expanded in the warmer air and began to leak. I put my uniform back on and drove to the hangar (I was one of the first of the recalled duty personnel to arrive). Once everyone was present, the chief put out the plan for re-configuring the leaking aircraft.

We first had to move an aircraft that had been parked in front of the one leaking fuel. Since it was getting late and everyone was anxious to get back home, I started to prepare things for both aircraft moves as quickly as I could.

I connected a tow bar to the first jet we were going to move and then moved an A/S 32A-45 tow tractor in front of it. I then connected a tow bar to the one leaking fuel and checked to see if there was room to back in a tow tractor. The wings on the first jet were folded, which gave me more room to operate, but an engine on a stand about six or seven feet from the jet complicated matters.

At first glance, it looked like I had enough room to make it through the gap between the stand and the aircraft. I hopped in the tractor and started backing it towards the leaking jet. I hoped to save some time and get back home sooner.

As I approached the gap and tried to line myself up to make it through, another Sailor stepped behind the tractor and started to guide me in. As I got closer to the gap, he directed me to straighten out. He then heard our chief say something and looked away just long enough for me to run the top of the tractor into the folded port aileron of the first aircraft.

I was in shock. I got out of the tractor and inspected the damage: the corner of the aileron was crunched. I stood there for a minute in disbelief.

That night and the following morning were extremely stressful. I had no idea what was going to happen to me, and I kept replaying that moment over and over in my head, wishing that I had not been in such a hurry. The next morning I was called in to give a statement and have a chat with the MO and safety officer. My entire holiday leave period had a black cloud over it because I was in a rush to leave that night.

I learned a valuable lesson about rushed work and risk management, but it was an expensive lesson indeed—$47,000.

Petty Officer Hinckley works in the airframes shop at VFA-34.

How We Blew It

By Major James Compton

It was another "standard" October training day at MCAS Iwakuni, Japan. As the afternoon progressed, clouds formed, the winds stirred, and the skies darkened south of the field. Five hours later, a thunderous boom rocked the flight line. It had nothing to do with the storm and everything to do with procedures not followed.

Aircraft 04 had launched on a training sortie prior to the storm. While the crew was airborne, the weather at the field worsened and the station weather office notified the squadron operations duty officer (ODO) that thunderstorm condition one had been set. The ODO passed word to Maintenance Control, and at 1430 all personnel were cleared from the flight line. Up to this point, everyone was following procedures, and information was flowing.

The maintenance department conducted technical training between 1500 and 1630. Aircraft 04 landed at approximately 1530. The aircrew shut down the aircraft on the flight line in accordance with cross-country rules, since recovery personnel weren't allowed out on the line. Maintenance Control decide to leave 04 armed on the flight line until thunderstorm condition one was lifted.

From approximately 1630 to 1700, day and night crews conducted face-to-face turnovers. The off-going Maintenance Control supervisor did a verbal turnover with his relief. However, the fact that there was an armed aircraft on the flight line wasn't entered in the Maintenance Control logbook, and the aircraft status board wasn't updated with a warning that aircraft 04 was still armed with CADs.

The night crew held its maintenance meeting at 1700, and Maintenance Control assigned the maintenance priorities for each division. Two tasks involved aircraft 04: repairing the miniature aircraft GPS receiver (MAGR) and removing and replacing a high-time BRU-32 on stores-station three. Both maintenance actions required the application of external electrical power via an NC-10.

Once the thunderstorm conditions were lifted at 1730, Maintenance Control put the communications/navigation Marines to work on the MAGR. External power was applied to the aircraft at 1815 to test the repair.

At 1820, the ordnance QAR/QASO put his team to work on the high-time BRU-32. During the next hour, the ordnance team completed the maintenance action and prepared for release and control checks. NC-10 power again was applied, and (per the work package) the weight-on-wheels safety switch was disabled. The maintainers hadn't consulted the work package earlier that evening. If they had, they would have come across this warning:

WARNING

To prevent injury to personnel or damage to aircraft, make sure cartridges are removed from pylons, racks and launchers.

When a Marine pressed the emergency jettison button (with the weight-on-wheels signal removed) a firing pulse was sent to the CADs on all BRU-32 units. The external fuel tank on station seven—which was filled with 2,200 pounds of fuel—was jettisoned.

You've heard it before: "Change is the mother of all risk." Quoted at safety stand-downs and during training, it essentially captures the idea that changes in a routine can create dangerous and unrecognized conditions. In naval aviation, the result of change can be catastrophic, fatal, or just down right embarrassing. Fortunately for us, it was just embarrassing.

Major Compton is the assistant aircraft maintenance officer at VMFA(AW)-242.

... the fact that there was an armed aircraft on the flight line wasn't entered in the Maintenance Control logbook, and the aircraft status board wasn't updated with a warning that aircraft 04 was still armed with CADs.

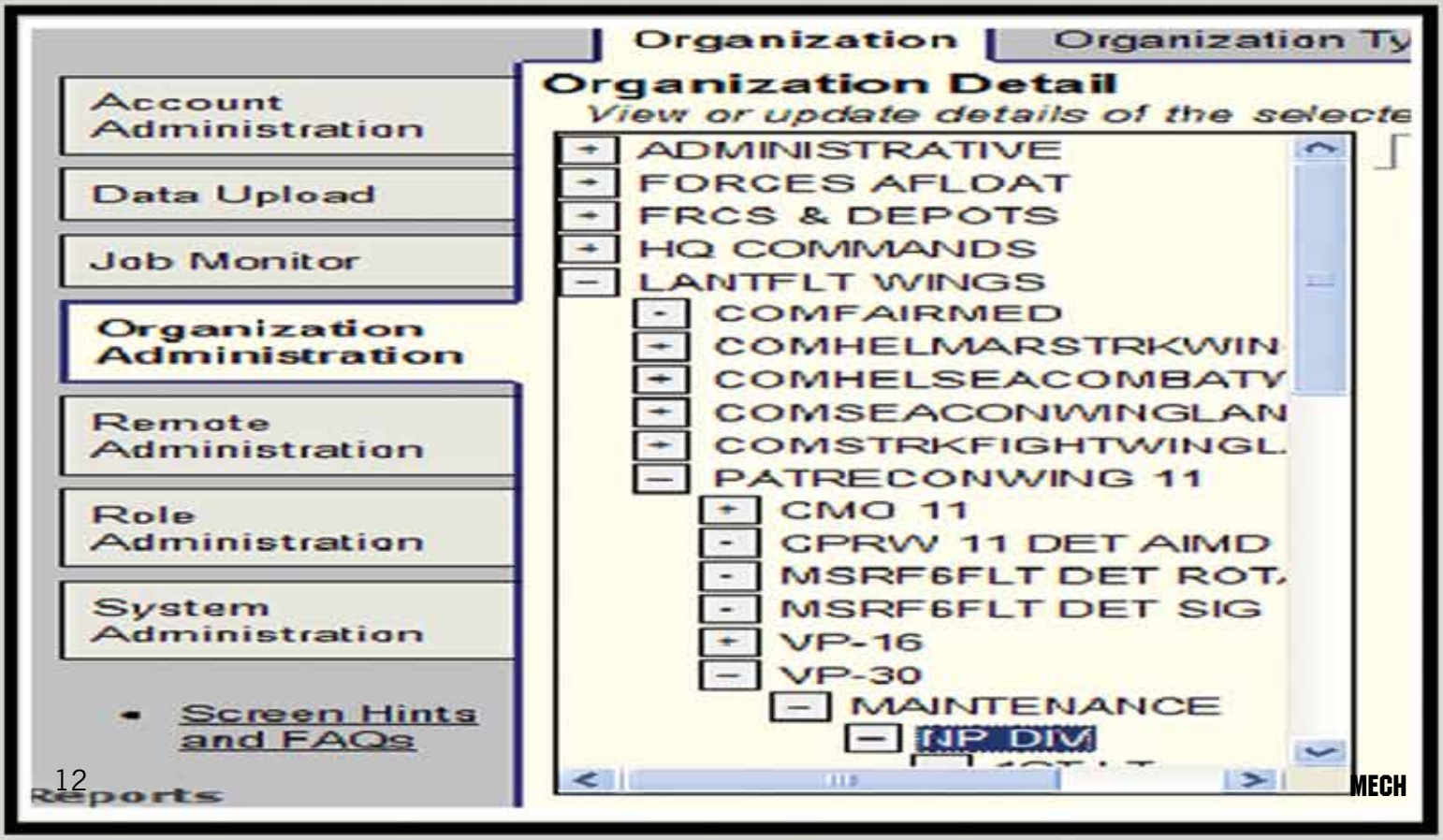
By Eric Seeley and Kevin Green

ASM Version 3.0 Is Here

Advanced skills management (ASM) is a web-based system—originally designed by aviation-maintenance professionals—that is now used by more than 70,000 Navy and Marine Corps personnel. ASM helps units develop and monitor training. Recently, version 3.0 was released.

The most significant change from version 2.0: All personnel, regardless of UIC, are now part of a single

Figure 1: New organizational detail.



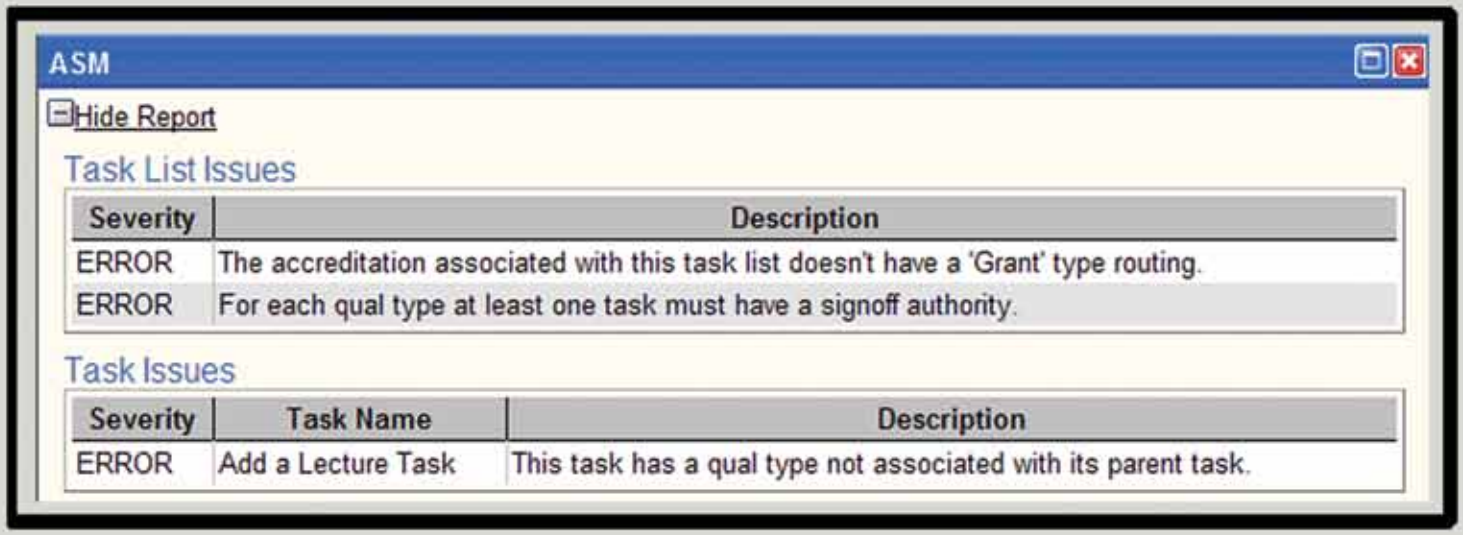


Figure 2: Real-time feedback in the development of task lists in ASM versions.

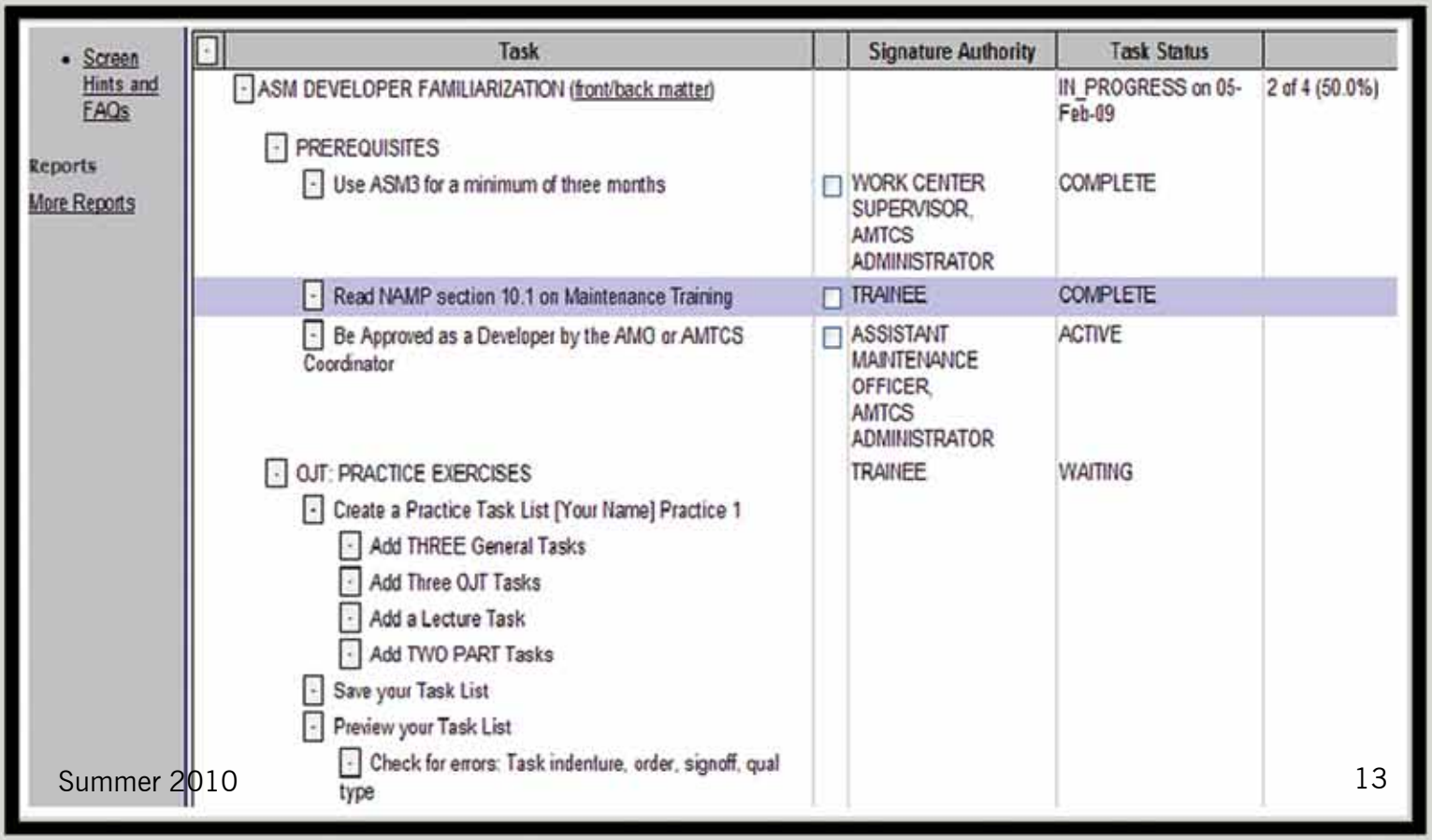
database. This transition offers a number of advantages. For example, with version 3.0, personnel will be assigned to organizations—either permanently or temporarily—using a new check-in/check-out process; their data, meanwhile, will remain in the same underlying database. In other words, the days of importing and exporting personnel between ASM databases are coming to an end.

The new version also will make it easier to locate personnel with very specific skills/proficiency levels throughout the entire fleet (see figure 1).

Version 3.0 allows users to develop, assign, and monitor training at a faster pace than previous versions. Like the previous version, task lists in the new version will describe detailed requirements to obtain qualifications, certifications, and licenses. Version 3.0, though, will offer real-time feedback to the user (see figure 2, top right.) thereby making the process more accurate and efficient.

Similarly, after task lists are developed in the new version, they and their signature authorities and status are now displayed in a more understandable, user-friendly format (figure 3).

Figure 3: Task list under review in ASM version 3.0.



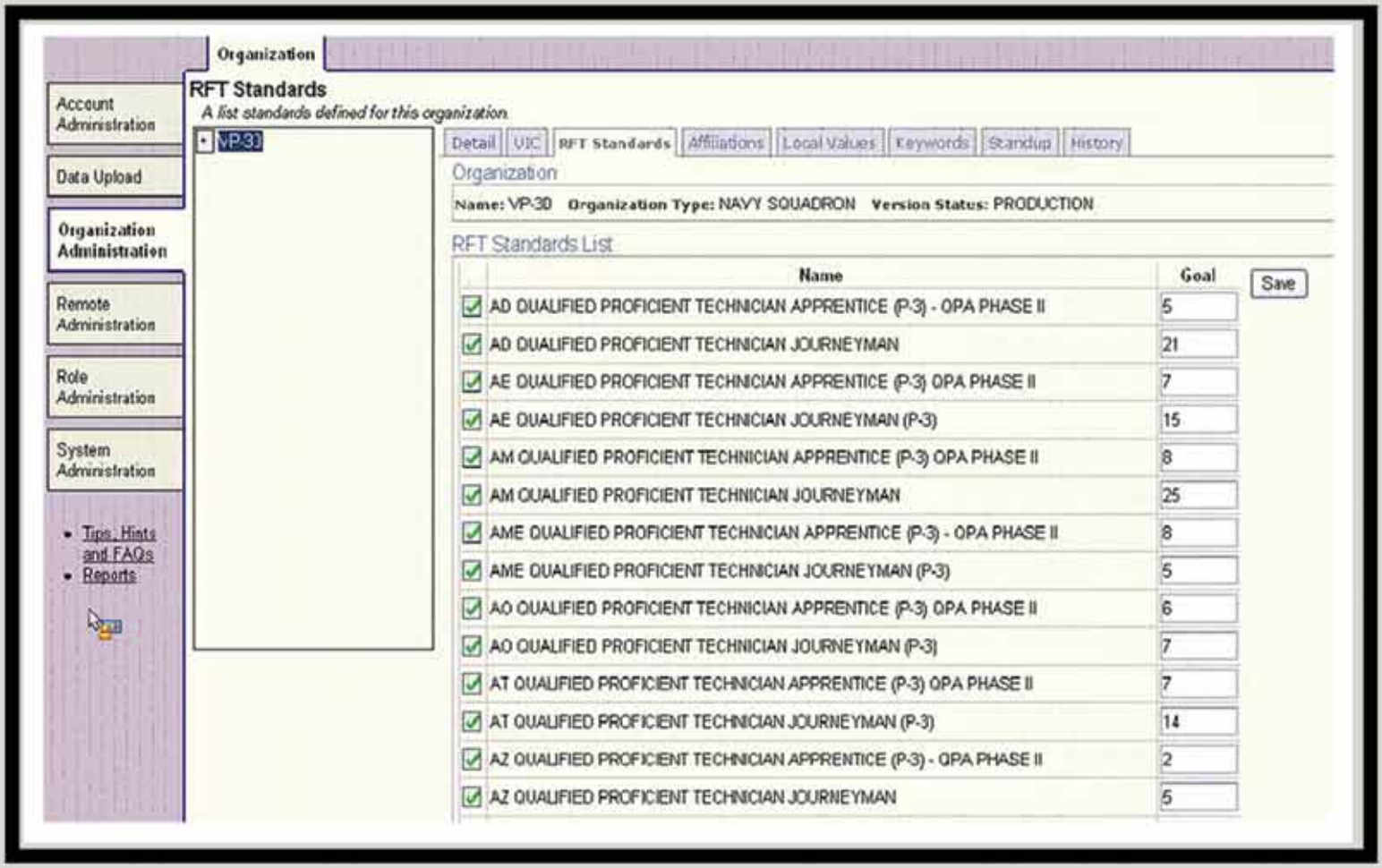


Figure 4: Gap analysis and the ability to set goals in ASM version 3.0.

ASM version 2.0 emphasized the ability to determine, in real time, the operational readiness of an organization (i.e. qualifications, certifications, licenses, and individual proficiency). ASM version 3.0 continues this emphasis and goes a step further. The ready-for-tasking (RFT) capability (figure 4) displays overall manning goals for the types of personnel required and their quantity.

This article merely scratches the surface regarding the recent enhancements to ASM. Additional information on ASM and the entire NAVAIR AMTCS/CBTSI program can be found at: https://amtcs.nmci.navy.mil/amtcs.net/

Mr. Seeley works in the enterprise systems-engineering division at Naval Undersea Warfare Center, Division Keyport. Mr. Green works at NAVAIR PMA 205.

The Human Relay: Fully Energized

By AT1(AW) Kyle Morton

It seemed like just another routine avionics-maintenance task: Aircraft 501, an EA-6B Prowler, required a new left DC hold-relay. The old one had been cannibalized from another aircraft. An AE2 and an AE3 checked out their tools and manuals, placed a MAF in work, and proceeded to the hangar to install the new relay.

They ensured power was secured and then completed the installation in accordance with the MIM. With the hard part out of the way, it was time to ensure everything was operational. The MIM calls for an electrical power test-set (AN/ASM-439). This, however, requires a low-power turn, which wasn't feasible because 501 was in the hangar for a special inspection. Instead, the two AEs opted to manually energize the relay and check the connections. This procedure isn't in the manual, and therefore is not an authorized method of testing the relay.

They applied ground power to the jet. Then, with meter in hand, the AE3 began reading for power at all the relay terminals. Unfortunately for him, this meant sticking his hand next to a nest of wires and terminal lugs. As he reached into the panel to read for power, he brushed up against a live wire, which jolted him immediately with a painful shock. The two secured power quickly and went back to the shop.

He felt okay at first, but after a mere ten minutes, his arms felt numb and he developed a severe headache. He was taken to medical and given an EKG, medication, and a day of SIQ.

This incident was minor, but the consequences easily could have been far worse: he could have been knocked unconscious by the shock and thrown from the top of the aircraft. Since the incident, the AE3 has educated the squadron on electrical safety, ORM, and the importance of strict adherence to maintenance procedures. As a result of this incident, the squadron implemented an additional control, wearing insulated gloves, when working around power.

Petty Officer Morton is a safety petty officer at VAQ-134.

Analyst's Note: Great job on implementing additional controls for the electrical hazards associated with the AE/AT work environment. If you have added additional controls into a maintenance procedure, I strongly recommend generating a TPDR or PQDR via the Joint Defense Reporting System (JDRS). Doing so will ensure the entire community benefits from your lessons learned. – MSgt. Michael Austin

HAVING A

By AT2 Steven Pokrant

I am an aviation-electronics technician assigned to the Mighty Shrikes of VFA-94, maintaining a dozen FA-18C Hornets. Repetitive special inspections make up most of my workload. With more than half of our deployment to MCAS Iwakuni, Japan, complete, I was bitten by an age-old nemesis: complacency. I got lucky on this one, but it easily could have been much worse.

It started out as a normal night. I showed up early to work and received a detailed pass down of the day's events. I attended the night-shift maintenance meeting and was assigned my tasking for the night: conventional release and control (R/C) checks on three aircraft. As an R/C team leader, I'm responsible for ensuring that checks are done safely.

My first mistake was allowing our NC-10 power cart to be parked on the left side of aircraft 405, one of the aircraft we were checking. When the job began, there were no other jets parked to the left of 405, so I deter-

BLAST

mined the location of the power cart didn't matter. Not so. In VFA-94, we are instructed to park power carts in front of aircraft. If heeded, this safety precaution ensures maintainers don't drive between the jets.

Sure enough, about an hour into the R/C checks on 405, the line shack towed aircraft 404 into the spot to the left of 405, blocking the NC-10 between the two jets. Shortly thereafter, the NC-10 malfunctioned and had to be replaced to finish the checks. By this time, maintainers were doing a low-power turn on 404 and had it running at 80 percent power.

Since I had to replace the broken NC-10, I decided to drive the tractor and power cart between and to the rear of the jets. My plan was to curve left around 405 to avoid the 404's exhaust, which was to my right as I was driving.

It was a bad plan with poor execution. I misjudged the distance during my left turn and picked up some of 404's exhaust blast. It dislodged the passenger window from the door frame, sending it crashing into cab and onto my forehead. The force of the blow knocked me silly and made me let go of the steering wheel. With my foot still on the gas, I drove straight through the exhaust, which shattered both the front and rear windshields of the tow tractor.

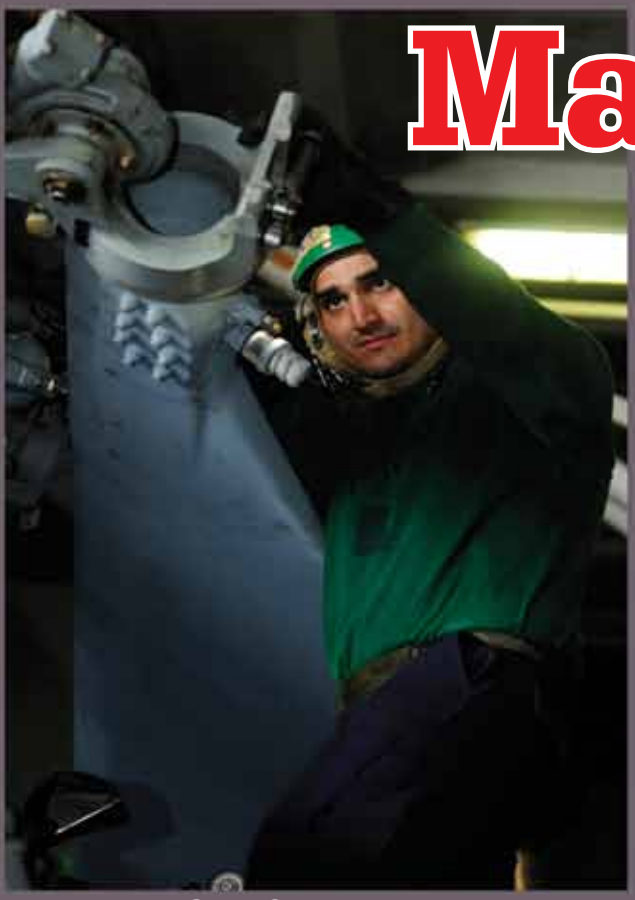
The driver-side door was bent out of its frame by about six inches. My fellow AT in the right seat was pinned down against me and by some miracle was unharmed. Once clear of the blast, I regained control, came to my senses, and then continued into the hangar where I parked the now-trashed tractor.

I received six stitches for the two lacerations on my forehead, a minor price to pay considering the severity of the situation. I was fortunate I wasn't hit with the full force of the window (it had ricocheted off of the cab's ceiling before smacking me). "What if I had taken the full force of the window to the head" I thought, "What if the tractor had flipped?"

This incident is a shining example of what happens when we don't take the necessary time to ensure the task is being done safely. I now have two scars on my forehead to remind me to slow down and think before I act.

Petty Officer Pokrant works in the avionics shop at VFA-94.

Maintainers in

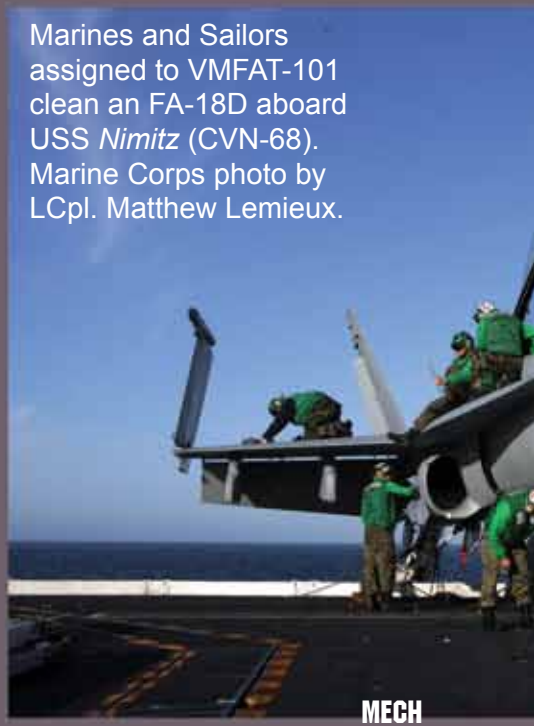


AD3 Gary Cooper, assigned to HSC-28, does maintenance on an MH-60S aboard USS *Wasp* (LHD-1). Navy photo by MCSN Richard Stevens.

SSgt. Steve Pojda, assigned to HMLA-169, does a QA final on a UH-1N fuel control unit at Al Taqaddum, Iraq.

AMAN Robert Kelley trains AMAN Andrew Moody on an EA-6B aboard USS *Dwight D. Eisenhower* (CVN-69). Navy photo by MC3 Chad Erdmann.

Marines and Sailors assigned to VMFAT-101 clean an FA-18D aboard USS *Nimitz* (CVN-68). Marine Corps photo by LCpl. Matthew Lemieux.



n the Trenches

ABAN Benjamin Gomez attaches a fuel hose to an aircraft in the hangar bay of the USS *Dwight D. Eisenhower* (CVN-69). Navy photo by MC3 Bradley Evans.

AOAN Alex Costin inspects an arming switch on an MK-82/BLU-111 2500-pound bomb aboard USS *Nimitz* (CVN-68). Navy photo by MC2 John Wagner.

AD2 Scott Schinke, assigned to HSL-42 Det. 7, removes a main rotor blade from an MQ-8B VTUAV aboard USS *McInerney* (FFG-8). Navy photo by MC2 Daniel Gay.

An $800,000 Loss

By AD3(AW) Joseph Cockrum and AD1(AW) Anthony Richardson

The first link in the mishap chain was four days prior to deployment. We had a very hectic workload and minimal manpower, but we aimed to get 12 aircraft "up" before securing. We met with Maintenance Control and prioritized the day's workload.

At the time, power plants only had one mech, an AD1 who was also qualified as a CDI. Since we were short on mechs, an AD3 who had recently transferred from power plants to the troubleshooter shack was assigned to help with the workload. One of the top priorities for the day: a pre-carrier inspection and engine wash on aircraft 204.

While the AD1 prepped the safety equipment for the engine wash, the AD3 (who would serve as turn operator) reviewed the ADB and attended the turn brief in Maintenance Control. Thanks to the day's heavy workload, the turn brief was rushed, and prior maintenance actions on 204 weren't discussed thoroughly. Because of this incomplete brief, the AD3 assumed the engine turn he would be doing was only for the pre-carrier engine wash. He failed to note the engine's removal-and-installation MAF in the ADB. The AD3 then relayed that erroneous assumption to the AD1.

When the AD3 did a pre-turn walk-around, he noticed the oil level was low, but he attributed it to the cold temperature. Following the engine wash, the AD3 helped the AD1 install a pressure bleed-air-regulator

The mechs assum in time and set out servicing it with th

Navy photo by MC3 John Woods

to the Navy

(P-BAR) valve. Afterwards, he quickly re-checked everything and noticed the oil was light brown. However, he assumed all was well.

The AD3 returned to the cockpit for the first fuel-introduced engine turn. The AD1 positioned himself on the deck to do leak checks.

The AD3 conducted pre-start engine-fire light checks and continued with normal start procedures. He signaled to the PC to start the APU and then moved the APU switch to "on." Upon receiving the green "ready-to-load" light, the AD3 signaled for engine start and cranked the starboard engine. As the engine began turning, he watched the engine's rpm climb to 10 percent. He didn't check the oil pressure. The AD3 pushed the right throttle forward and watched the PC for any hand signals.

As the engine came online, the AD3 did a cockpit lights check—no lights appeared. This indicated to him that the right generator had failed. The lack of electrical power in the cockpit brought the AD3's attention back to the engine fuel display (EFD). The AD3 saw that the starboard engine oil was at a mere 8 psi. The AD1 also had noticed some-

ned they had caught the mistake to turn the engine again after e correct oil.

Navy photo by MC2 Matthew Williams

The starboard engine was secured and the chip detector was removed and inspected.

thing wasn't right: engine oil wasn't cycling through the engine-oil sight-gauge. The mechs shut down the engine and went inside to tell Maintenance Control.

It turned out that the oil in 204's engine wasn't operating oil (MIL-L-23699). Instead, it was preservation oil (also known as "1010" oil) which is light golden brown. During transport of an engine that has been treated with "1010" oil, excess oil may collect in the engine-oil sight-gauge. This was the oil that the AD3 noticed when he did his cursory walk-around inspection. Because he was poorly prepared for the turn, he was unaware of the wrong oil until it was too late.

After realizing their mistake, the mechs serviced the starboard engine with 288 ounces of operating oil. The AD1 reported the oil servicing to Maintenance Control (he assumed Maintenance Control knew that the engine was turned with the "1010" oil). In fact, Maintenance Control was not aware and further maintenance on 204 continued.

The mechs assumed they had caught the mistake in time and set out to turn the engine again after servicing it with the correct oil. Again, the AD3 went through all of the pre-start checks and started both engines without any issues. The AD1 did the leak checks and didn't see any discrepancies.

Later that evening (in preparation for the next day's A-profile FCF), the AD3 was tasked to do yet another engine turn on aircraft 204, the result being the same—no discrepancies.

The next morning, all seemed normal with 204; that is, until an MSP code of 772 appeared, signifying a right-engine chip-detector. A troubleshooter removed the chip detector and showed the AD1. Both AD1 and the troubleshooter agreed that the chip detector was out of limits for normal wear and tear based on the amount of metal particles present. The engine was subsequently downed.

Maintenance Control and power plants decided to do an engine flush followed by another engine turn. Approximately five minutes into the engine turn, the MSP 772 code popped again. The starboard engine was secured and the chip detector was removed and inspected. Maintainers found fewer metal particles this time around. The chip detector was cleaned and re-installed, maintenance codes were reset, and yet another engine turn was done.

This time, the MSP 772 code popped immediately. The engine was secured and the chip detector was removed and examined. It contained approximately the same quantity of particles it had after the previous turn. The AD1 and another PO1 mech went inside to inform Maintenance Control.

Maintenance Control decided to try one more flush of the engine, so the mechs went back out to 204. While trying to rotate the power transmission shaft (which connects the motor to the auxiliary-mounted accessory drive), maintainers discovered that the shaft would not rotate. One mech climbed into the intake duct and tried to rotate the fan blade by hand—no joy.

Bottom line: After a series of poor decisions and communications breakdowns, the starboard engine on 204 had seized; an $800,000 dollar mistake had been made.

Petty Officer Cockrum works in the troubleshooter work center, and Petty Officer Richardson works in the power plants shop; both at VFA-103.

Arcing and Sparking: A Tailhook Pin Story

By AOAN David Roberts

As an experienced plane captain, I'm comfortable working on the flight deck and FA-18E Super Hornets. Unfortunately, my comfort led to a critical mistake during a recent COMPTUEX aboard USS *Dwight D. Eisenhower* (CVN-69).

Our squadron was manning the Alert 15 fighter. The exercise scenario called for our jet to launch late at night. Pressure was high as everyone from admiral to airman on the flight deck was being evaluated in a high-stress, simulated-war environment.

After we launched our Alert 15 fighter, Maintenance Control called for a new fighter to replace the one that just had launched. Our maintenance department worked fast to meet all the requirements to get another jet set for the alert. I was the PC for the replacement jet and rushed to aircraft 103 to prepare it for flight.

When I arrived at the aircraft, another PC was already at work setting up the cockpit. I asked if he needed help. He told me that the battery was low, and I quickly looked around for the nearest power source. I opened 9L door to plug the power cord into the aircraft's ground-power receptacle. Doing so, I checked the power cord twice to make sure the prongs matched up. The power cord fit into the receptacle and didn't give me any more trouble than it usually does.

Then I went to the deck well to turn on power. When I stepped into the deck well, I heard someone yell "Ready!" In response, I turned on power and gave a thumbs up.

The plane captain in the cockpit saw my signal and, sure enough, set the external power switches so the aircraft could receive the external power. As soon as he did, sparks exploded all around me as I stood in the deck well. I looked up to see a bright light and a small, bright flame coming from the aircraft. I jumped out of the deck well and took a few steps before I remembered the plane captain in the seat. I turned around in time to see another Sailor pull the plug from the aircraft, stopping the fire.

The electrical short and subsequent fire had been caused by the tailhook pin and lanyard. When aircraft are parked tail-over-water (TOW), it was a common air-wing maintenance practice to pull out the tailhook pin and place it in the ground-power-receptacle door, instead of in the aircraft pin-bag. The metal tailhook pin can fit neatly in between the electrical connectors of the ground-power receptacle, leaving just enough space for the ground-power cord.

Aircraft 103 was parked aft of the island. The port side of the aircraft was very dark, too dark for me to see into the ground-power receptacle. In my rush to get the aircraft prepped, I didn't thoroughly check the receptacle before plugging in the cord. The pin and lanyard caused a short when three-phase 115-VAC power was applied. Later, I found out that the "Ready!" call I had heard and had responded to was in fact an AO informing another AO that the aircraft was grounded—it wasn't a call for power.

No one was hurt and damage to the aircraft was minimal. I have applied external power to aircraft many times, but never have considered the tailhook pin a potential hazard. Because of this incident, all squadrons in Carrier Airwing Seven have stopped the practice of placing tailhook pins in the ground-power-receptacle door.

Airman Roberts is a plane captain at VFA-143.

Sailors and Marines Preventing Mishaps

BRAVO Zulu

Top Row (left to right): Sgt. Jason Collett, Sgt. Christian Dowell, Cpl. Zechariah King, LCpl. Joshua Carter
Bottom Row (left to right): Pfc. David Ramsbacher, LCpl. Mary Whiddon, LCpl. Dennis Scott, LCpl. Matthew Floyd

VMA-223
Disaster Averted during Time-Critical Emergency

On 2 March, 2010, an AV-8B Harrier loaded with white phosphorus rockets returned from a close-air-support training sortie. A brake fire broke out as the aircraft parked in the combat-aircraft loading area (CALA) at NAF El Centro. Maintenance Marines from VMA-223 executed their emergency procedures without hesitation.

Lance Corporal Whiddon used the hand signal for brake fire to alert the pilot, and Lance Corporal Scott began spraying Halon on the main-landing-gear. The fire re-ignited several times because of dripping hydraulic fluid. Staff Sergeant Hartmayer, Sergeant Dowell, Corporal King, Lance Corporal Floyd, and Private First Class Ramsbacher all made multiple runs for additional Halon bottles, which were positioned at various locations in the CALA.

Sergeant Collett recognized that the limited amount of Halon was being exhausted quickly and instructed Lance Corporal Scott to conserve it until crash fire rescue (CFR) arrived. Scott used short bursts of Halon to suppress the flames only when the fire re-ignited. In all, Marines used five Halon bottles to contain the fire before CFR arrived on scene.

Staff Sergeant Egner and Lance Corporal Carter, both ordnancemen, quickly downloaded the loaded rocket pod from the burning jet and moved it across the flight line to a safe area.

The quick reaction and coordinated efforts of all Marines involved allowed the pilot to exit the aircraft without injury. The aircraft, which sustained only minor damage, was back on the flight schedule two days later.

AT2 David Noble
HSL-49 Det. 5

Petty Officer Noble was serving as the flight-deck director during a straightening evolution on Red Stinger 101. The LSO opened the beams of the rapid securing-device to center the recovery-assist securing and traversing probe. Noble felt the onset of a heavy roll and called immediately to close the beams. The ship rolled left approximately 14 degrees, lifting the starboard main mount off of the flight deck and pushing the port stabilator into the deck. Petty Officer Noble's time-critical risk management prevented an aircraft rollover and possible aviation ground mishap.

AO3 Emmanuel Joseph
VP-16

Petty Officer Joseph prevented a costly aircraft towing mishap with quick thinking and attention to detail. While conducting a routine aircraft move from the wash rack to the VP-16 parking ramp, the tow-bar shear-pin separated. Realizing immediately that the tow bar was separating from the aircraft, Joseph acted quickly and directed his brake-rider under instruction to apply steady pressure to the brake. The aircraft was brought to a complete stop, and a potential ground mishap was averted.

AEAN Gregory Dungey
VP-46

Airman Dungey was doing a signal-data recording-system download on a P-3C when he entered the main-load-center and noticed it was considerably hotter than normal. There was no smoke, but a burning smell was in the air. Dungey notified the aircrew, who secured electrical power to the aircraft. Then he contacted his supervisor and notified Maintenance Control. Airman Dungey and his supervisor did a more in-depth inspection and found that transformer rectifier No. 1 was overheated, which could have led to a fire in the main-load-center.

AT2 Jacob Hood
VR-46

While completing a turnaround inspection prior to aircraft launch, Petty Officer Hood discovered that the leading-edge slats on the starboard wing were worn in several areas, which indicates metal-on-metal rubbing. He had to go out of his way to find this problem—the location was very difficult to see during turnaround inspections. Further inspection of both wings revealed multiple, similar discrepancies. Maintenance Control spearheaded an overhaul of the slat components particular to this discrepancy. Petty Officer Hood's in-depth inspection prevented the failure of a slat component, which could have caused a mishap.

AWF2 Andrew Trujillo
VRC-40

While repositioning the wings of a C-2A after an FCF, Petty Officer Trujillo noticed smoke coming from the aircraft's port engine and hydraulic fluid pouring from the port wheelwell onto the landing gear and ramp. The leak was caused by a cracked line in the lower-cowl assembly. Trujillo directed the pilots to shut down the engines, signaled other personnel working on the flight line, and called for a spill team. Petty Officer Trujillo's quick actions saved the aircraft from further damage.

ADAN Tiffany Stanforth
HS-10

Airman Stanforth was doing a 28-day special inspection when she discovered several loose bolts on a faulty main-rotor swash-plate assembly. Further inspection revealed the component was separating from its housing assembly. Stanforth's detailed inspection prevented a possible catastrophic failure of a critical aircraft component.

CROSSFEED

Maintenance Officer
Cdr. David Peacott
david.w.peacott@navy.mil

Editorial Coordinators
MSgt. Michael Austin
michael.z.austin@navy.mil

ATCS Thomas Crook
thomas.crook@navy.mil

Egress/Environmental Systems

Are We Doing it Right?

By AMEC(AW) Eric Wickham

Problems: During safety surveys, I repeatedly find examples of maintainers not following the pubs. This problem often stems from a lack of knowledge about the publications. Recent examples include medically unqualified personnel doing maintenance on NVG systems, oxygen-use-only tool boxes contaminated with grease and oil, and LOX coveralls/gloves torn or, in some cases, missing.

Solutions and Best Practices: Junior Sailors and Marines have to be shown how to conduct maintenance safely; that includes getting them into the pubs. When training junior personnel, quiz them on publications: have them show you the references. It's no coincidence that maintenance departments with pub-savvy Sailors and Marines have strong work centers and solid maintenance programs; that was evident when I visited VRC-30 Det. 5, VFA-27, and FRC Atsugi on a recent survey trip.

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

Power Plants

NOAP Missteps

By ADCS Charles Clay

Problems: In the Navy oil-analysis programs (NOAP) I've surveyed recently, I've noticed four common discrepancies:

- Adverse samples are not logged in the AESR/miscellaneous history.
- DD Form-2026 results are not documented.
- DD Form-2026 adverse "re-samples" are not highlighted to indicate an urgent sample.
- Aircraft gearboxes/transmissions are tested incorrectly.

Solutions: Sometimes program managers lose sight of what's really going on with their programs and rely on QA monitors too much.

As a program manager, you should ensure the logs and records clerks enter adverse samples in the appropriate AESR (indicating the type and amount of contaminant, corrective action, and the results of subsequent sample analyses).

Remember, receiving an advice-code "A" does not mean your sample result was correct; you still will have to ensure data on the test results indicates the correct testing method was done.

Don't just rely on the local NOAP lab. Use the 17-15.50 and the aircraft MIMs to ensure the correct testing is being done—be familiar with the NOAP references.

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

Avionics

Compass Calibration: Gettin' in the Swing of Things

By ATCS(AW/SW) Thomas Crook and AEC(AW) James Esslinger

Problem: New aircraft navigation systems may have reduced the need for compass swings, but they haven't eliminated the need for accurate documentation. Too often, the "miscellaneous history" section of the aircraft logbook, MAF/work order, or compass card is incomplete or filed incorrectly in maintenance admin. Accurate documentation is critical to aircraft mission capability and safety of the crew.

Solutions: Review your logbooks for entries from the last compass swing. Make sure you at least have a copy of both sides of the compass card(s). For dual systems, both systems should be recorded on the card. If the last check was an in-flight verification, documentation from that check should be accompanied by a copy of the most recent swing on the compass rose.

The information recorded on the front and back of the compass correction card—which is determined by the NAMP—must include the system, date, method, CDI/pilot, geographic location, and aircraft BUNO.

MAF documentation for a swing or verification should reflect the reason for the check (e.g., scheduled maintenance, component replacement, or out-of-tolerance condition).

Review COMNAVAIRFORINST 4790.2A, Chapter 5, para. 5.2.1.17.1.4.5 for guidance on logbook entries. Chapter 6, para. 6.1.2.1.8.3 covers program management and documentation.

Best Practices: Maintain a program binder with references, site surveys, applicable deviations (if any), and copies of the most current swing results for each aircraft.

Senior Chief Crook and Chief Esslinger are maintenance analysts at the Naval Safety Center.

Analyst's Attaboy

During the Naval Safety Center's recent trip to Japan, I surveyed two squadrons that have outstanding hazmat programs. Bravo Zulu to AT1 Mead of VAW-115 and LS2 Kenyenso of VAQ-136 for their superb efforts as program managers. Their hazmat programs meet and exceed the requirements set forth in the 4790. I asked them what they had done to make their programs so outstanding. Both answered that they followed the CSEC.

– AMCS(AW/SW) Raymond Nichols

Clear Case for Clear Grease Guns: Update

By MSgt. Michael Austin

Many Mech readers have probably seen a Crossfeed article (or two) about Clear Grease Guns. The grease guns, manufactured by Lubrication Engineers, Inc., are designed to take the guess work out of identifying what kind of grease is used on equipment.

Clear Grease Guns can be ordered through the military supply channel: PN 12CMBLK, NSN 4930-01-550-8352 (pistol-grip model); PN11PGMBLK, NSN 4930-01-550-8348 (lever-style model). You can also open-purchase them or get replacement parts from the manufacturer: http://www.cleargreaseguns.com/.

In addition to the standard, black-colored collar, the manufacturer now sells collars in six other colors. Maintainers can color-coordinate grease-gun collars with grease-tube end caps, further reducing the chance that the wrong grease will be applied to equipment. At present, the new collars can only be open-purchased.

If you are using Clear Grease Guns in your command, make sure they are accounted for (per your local tool-control program) and are marked accordingly.

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

Are You Ready to Be Audited?

By MSgt. Michael Austin

The QA discrepancies found by Naval Safety Center surveys in the past two years echo those found by Commander Naval Air Forces (CNAF) Aviation Maintenance Management Team (AMMT) inspections. According to CNAF, for programs graded as either "off track" or "needs more attention," the quality assurance audit program is No. 1 on the 2009 list of the "top" ten maintenance programs (in the organizational-level NAMP).

Problems and Solutions: Listed below are five common QA-related discrepancies found on **CNAF/NSC inspections:**

1. Not all CSECs are routed to the MO. Also, with so much routing done electronically, key managers are left out of the information/decision-making loops, with limited visibility of the programs for which they are responsible.

CNAF: All CSECs shall be routed to the MO. The MO should give substantive feedback to his maintenance officers, not just a signature.

NSC: We recommend all audits be routed to the MO immediately following an audit. A working copy of the audit should be provided to the respective program manager/work-center supervisor. VAQ-136, one of the squadron's we've surveyed recently, has an efficient electronic QA audit tracking/trending program: The QAS imports CSEC data into a Word format and routes it electronically via Outlook.

2. QA does not maintain an archive of at least one year's worth of audit data.

CNAF: For example, if you completed a program audit in January 2010, then you should have the January 2009 audit on file—until the January 2011 audit is completed.

NSC: Review and update audits continually. Also, don't fall into the bad habit of leaving corrective actions open-ended with no follow-up (we've seen a lot of this in the last two years). An audit filed is not an audit completed. You can (and should) follow up periodically on program hits. Those follow-ups don't require special audits, unless the MO directs it. Also, don't forget to do turn-over audits when new managers are assigned. Route those turn-over audits so your chain of command knows the state of the turned-over program. All too often, we find programs that have been neglected and then turned over. The common excuse we hear: "I just turned over last week."

3. QARs have not attended all the required formal schools.

CNAF Guidance: QARs, QAOs and QASs are required to attend the Naval Aviation QA Administration Procedures Course D/E 555-0046 (older classes are acceptable). Also, all O-level QARs are required to attend the Aircraft Corrosion Control Course N-701-0013 or C-600-3183 within 60 days of assignment to a QAR billet.

NSC: Key assignments should be rotated and staggered, to prevent large turnovers and program-management gaps. Assigning personnel to key billets (i.e. QAR QAO, and QAS) for a minimum of one year will ensure better personnel (and program management) continuity.

4. QA doesn't document walk-through safety inspections on semi-annual work-center audits.

CNAF: Use the NSC walk-through safety inspection checklist (found on the NSC website), and attach the completed checklist to work-center audits.

NSC: The NSC website has workspace checklists and best practices that we recommend commands review and tailor to their needs. Remember, the NAMP requires walk-through inspections as part of work-center semi-annual audits.

5. CDIs are doing in-process inspections or final inspections on FCF work orders/MAFs. Not all of the tasks associated with the FCF are reviewed and/or completed by QARs.

CNAF: Only QARs and CDQARs can complete final and in-process inspections on FCF work orders/MAFs.

NSC: Ditto. QARs should be involved in all aspects of FCF maintenance.

Best Practices: Consult the CNAF website for trends and program management recommenda-

tions: https://www.portal.navy.mil/comnavairfor/N42/N422/Shared. The site also contains detailed information on the top ten most common QA discrepancies.

Safety Center logs-and-records analysts maintain an online spreadsheet of real-time trends which tracks maintenance discrepancies by work center and by the percentage of occurrence: www.safetycenter.navy.mil. This is a great tool to reference when doing self-evaluations of programs.

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

Check out our new website

Our new URL: http://www.public.navy.mil/navsafecen/
You can still get to our site using www.safetycenter.navy.mil, but bookmarking will not be possible.

Class C Mishap Summary

By MSgt. Michael Austin

From January 2 to June 1, 2010, Navy and Marine Corps units reported 43 Class C mishaps involving aircraft. Of these, 22 were later downgraded because of new threshold requirements in OPNAV 3750.6R. Eleven of the 21 remaining Class C incidents had direct maintenance-malpractice implications.

Below is a list of the recent, avoidable maintenance-related mishaps:

1. FA-18C: Door-3 fasteners were improperly installed, which resulted in a FODed starboard engine.
2. FA-18A: Follow-me truck collided with aircraft parked on the transient line.
3. FA-18C: Port stabilizer was damaged after aircraft respot.
4. CH-53E: Improper wiring of aircraft connector resulted in inadvertent release of an external load in flight.
5. FA-18C: Maintainer over-extended port wing and damaged it during a wing-fold rigging procedure.
6. FA-18E: Maintainer installed form-in-place seal fasteners incorrectly, which resulted in a damaged port stabilizer.
7. C-2A: Maintainers damaged a wing assembly during removal and replacement of a wing-fold actuator.
8. AV-8B: Maintenance tow-crew ran a tow dolly into the station-4 TPOD.
9. EA-6B: Maintainer received electric shock during maintenance on an aircraft.
10. E-2C: Vapor-cycle evaporator unit was damaged during maintenance.
11. FA-18C: Maintainer was injured during an ordnance loading procedure.

After reviewing the latest batch of maintenance-related mishap events, incidents of aircraft crunches or ground-move accidents appear to be declining. Three mishaps occurred during aircraft movement or towing; two people were injured during troubleshooting and loading evolutions.

Incidents stemming from maintainers not following the pubs appear to be on the rise. Six out of the 11 Class C events listed above involved procedures not followed; that's more than half of the maintenance-related Class Cs for this period.

When it comes to aviation maintenance, procedures and directives are specific and clear, and

there are a number of controls in place. Often, problems occur during the time-critical phase of maintenance. The following mishap narrative (and the accompanying photos) describes an all-too-familiar example of what goes wrong in time-critical situations:

An FA-18C was pulled forward to be spotted on the flight deck. During the move, the trailing, outboard tip of the port stabilizer struck the ship's nav-pole. The collision occurred when the tail swung to the left as it was pulled forward.

Moving an aircraft from one spot to another should be relatively simple. We brief, plan, and follow procedures (most of the time). But things tend to go south quickly when factors such as weather, sea conditions, and op tempo change. Factor in an inattentive tow-crew member, and you've got the perfect recipe for a mishap.

So, how do we prevent a situation like the one described above? It's as easy as following the ABCDs of time-critical risk management:

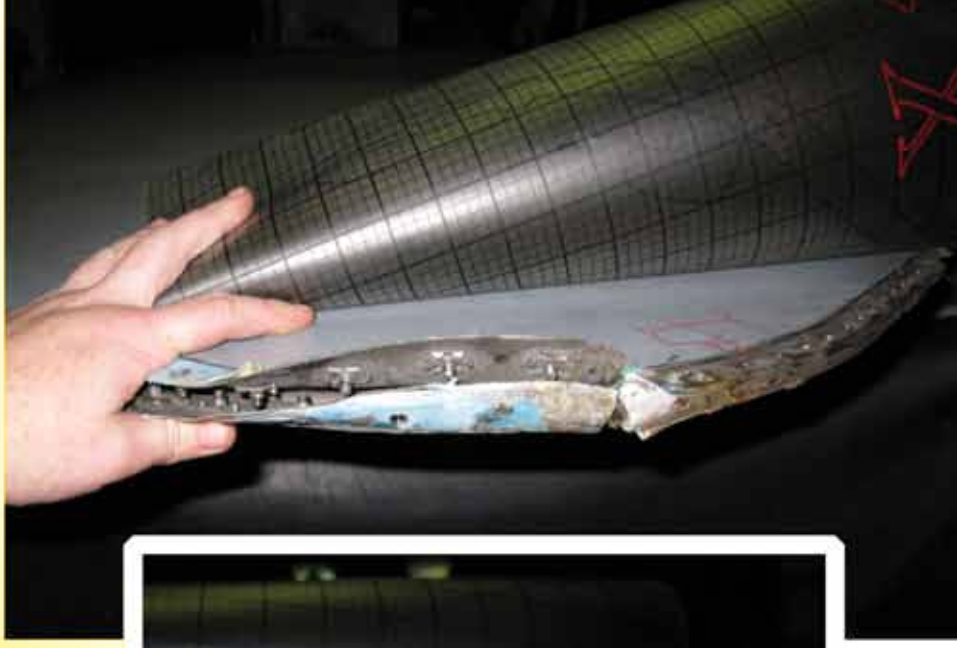
Assess continually what can go wrong and what is different or out of the norm. Every member of a tow crew should maintain a good scan, watching for hazards on and around the aircraft—at all times.

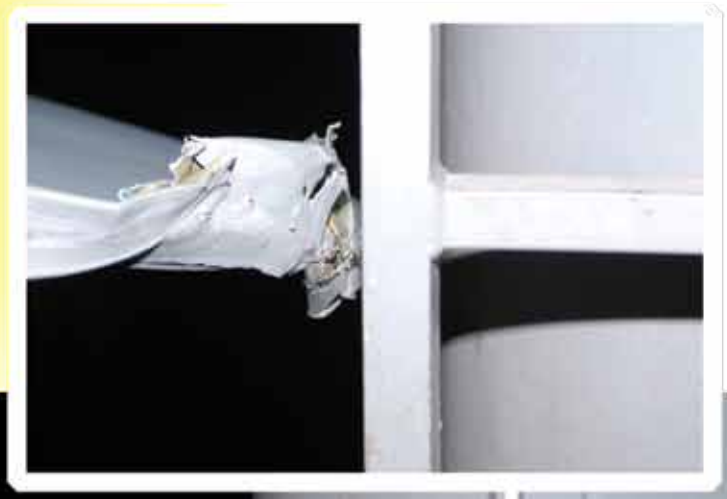
Balance your assets, people, procedures, tools, and support. Ensure all tow-crew members have the experience and qualifications to do each task.

Communicate continually with your team or crew. The tow crew should use whistles and hand gestures throughout evolutions to communicate positions and hazards.

Do and debrief the items of the task that can be improved—capture the lessons learned. All members should debrief collectively, correcting deficiencies noted during the process. Doing so helps prevent learned bad habits and complacency from forming.

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





Flight, Flight-Related, and Ground Class A and B

Mishaps

03/09/2010 to 06/07/2010

Class A Mishaps

Date	Type Aircraft	Command
03/10/2010	FA-18D	VMFA(AW)-224

Dual engine fire indications during maintenance check flight. Aircraft destroyed.

Date	Type Aircraft	Command
03/15/2010	FA-18E	VFA-137

Two aircraft collided during training mission.

Date	Type Aircraft	Command
03/23/2010	KC-130J	VMGR-152

Aircraft wing tip struck boom and tail of another aircraft during taxi.

Date	Type Aircraft	Command
03/31/2010	E-2C	VAW-121

Aircraft crashed into water.

Date	Type Aircraft	Command
04/12/2010	T-39N	VT-86

Aircraft crashed during day training mission. Aircraft destroyed.

Class B Mishaps

Date	Type Aircraft	Command
04/16/2010	FA-18D	VMFA(AW)-121

Starboard engine failed during approach.

Date	Type Aircraft	Command
05/17/2010	EA-6B	VAQ-137

Nose gear up short field arrestment at naval air station.

Date	Type Aircraft	Command
05/29/2010	FA-18C	VMFA-312

TFOA en route.

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Naval Safety Center Data
For questions or comments, call Lt. David Robb
(757) 444-3520 Ext. 7220 (DSN 564)

Helping Sailors and Marines Help Themselves

Sierra Hotel

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

MRMs

AMO School
ASO School
VR-56
VMA-214
NSWC, Indian Head Division
NSAWC

Safety Surveys

HSL-51
VFA-195
VAW-115
VRC-30
HS-14
VFA-27
VAQ-136
VFA-102
VFA-115
AIMD NAF Atsugi
MALS-12
MALS-36
VMGR-152
HMM-265
VFA-31
VR-62
VP-8
HSL-44
VR-58
HSL-60
VP-10
VPU-1
VP-45
VAW-120
HSC-9
VMAQ-4
VMAQ-3
VMGR-252
VMA-223
HMLA-269
HMLA-167
VMM-264
MALS-29
H&HS MCAS New River

Culture Workshops

HMH-362
VFA-122
VAW-113
VP-40
VP-9
HMM-265
VFA-22
VP-4
VMGR-152
HSC-28
HSL-42
VAW-124
HT-28
VMAQ-3
HM-15
VR-54
VRC-30
VPU-2
VX-9
VR-51
VFA-14
VFA-41
VMFA-314
VR-1
VMFA-323
HS-15
VAQ-137
VMM-263
VMA-211
VAQ-141
VR-46
HM-14
HSC-22
VAQ-134
HMM-774
VT-31
HSM-70
VQ-7
VMFA(AW)-225

Navy photo by MC2 Zachary Borden.

For more information or to get on the schedule, please contact:
- Safety Surveys, Maj. Anthony Frost at 757-444-3520 Ext. 7223.
- MRM, GySgt. Edward Rivera at 757-444-3520 Ext. 7285.
- Culture Workshop, Cdr. Duke Dietz at 757-444-3520 Ext. 7212.


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a cranial should be your
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