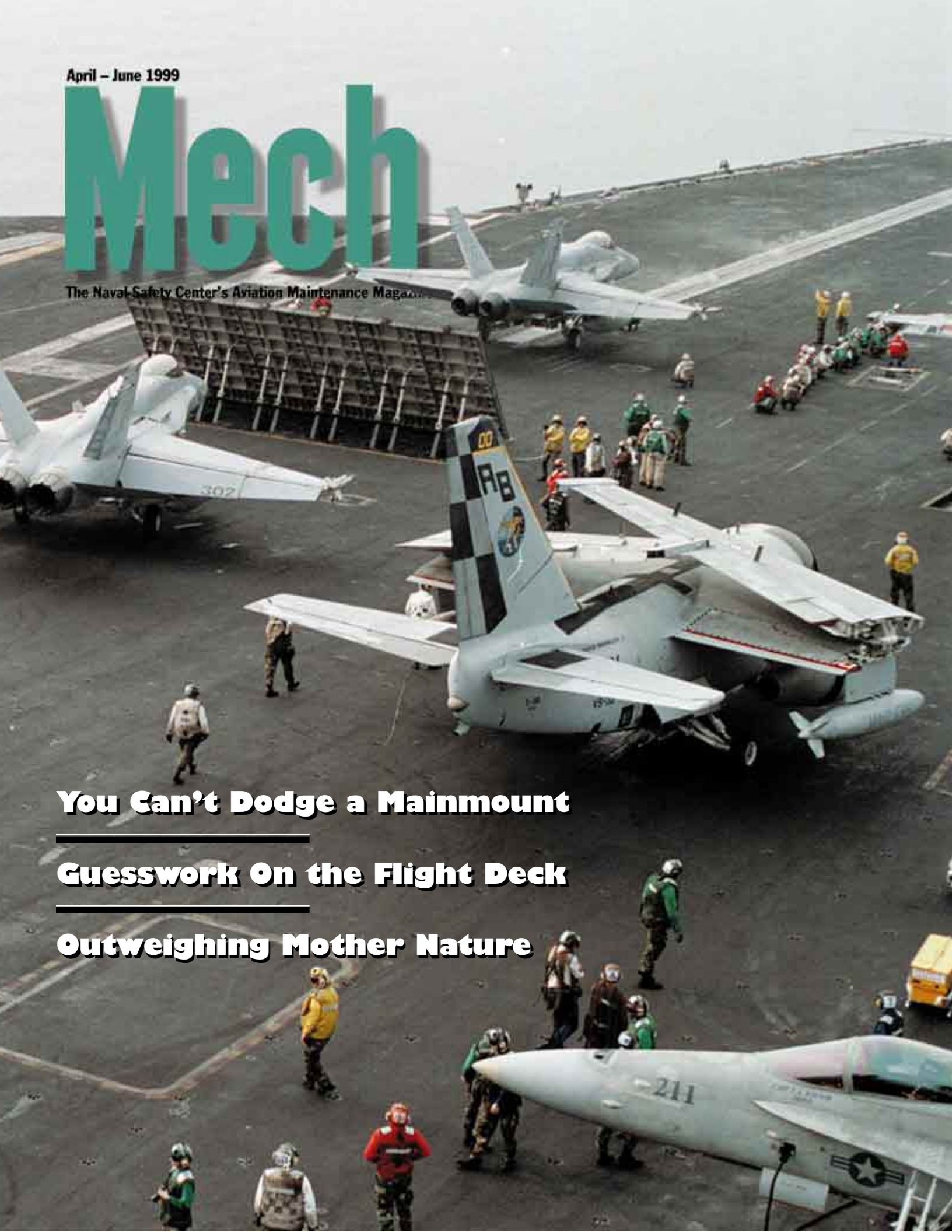
April – June 1999

Mech

The Naval Safety Center's Aviation Maintenance Maga...



You Can't Dodge a Mainmount

Guesswork On the Flight Deck

Outweighing Mother Nature

THE NAVAL SAFETY CENTER'S AVIATION MAINTENANCE MAGAZINE

Mech

Vol. 2, No. 6, Apr – Jun '99

On the cover:

USS *Washington* (CVN 73) Persian Gulf – Airwing One aircraft line up to launch for Operation Southern Watch. *Photo by PN3 Sammy Dallal*

Mech (ISSN 1093-8753) is published quarterly by the Commander, Naval Safety Center, 375 A Street, Norfolk, VA 23511-4399. *Mech* contents should not be considered directive and may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. Views expressed in guest-written articles are not necessarily those of the Naval Safety Center. Periodicals postage paid at Norfolk, VA, and additional mailing offices.
• **POSTMASTER:** Send address changes to Mech, Naval Safety Center, 375 A Street, Norfolk, VA 23511-4399.

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The Long Fl

We were nearing the end of a UNITAS det in Pisco, Peru, and the aircraft hadn't had a major problem. We'd completed every mission. With only one recovery left to handle, we began to think about going home. But when the aircraft landed around 0800, oil was streaming from No. 4 engine all the way aft to the tailpipe.

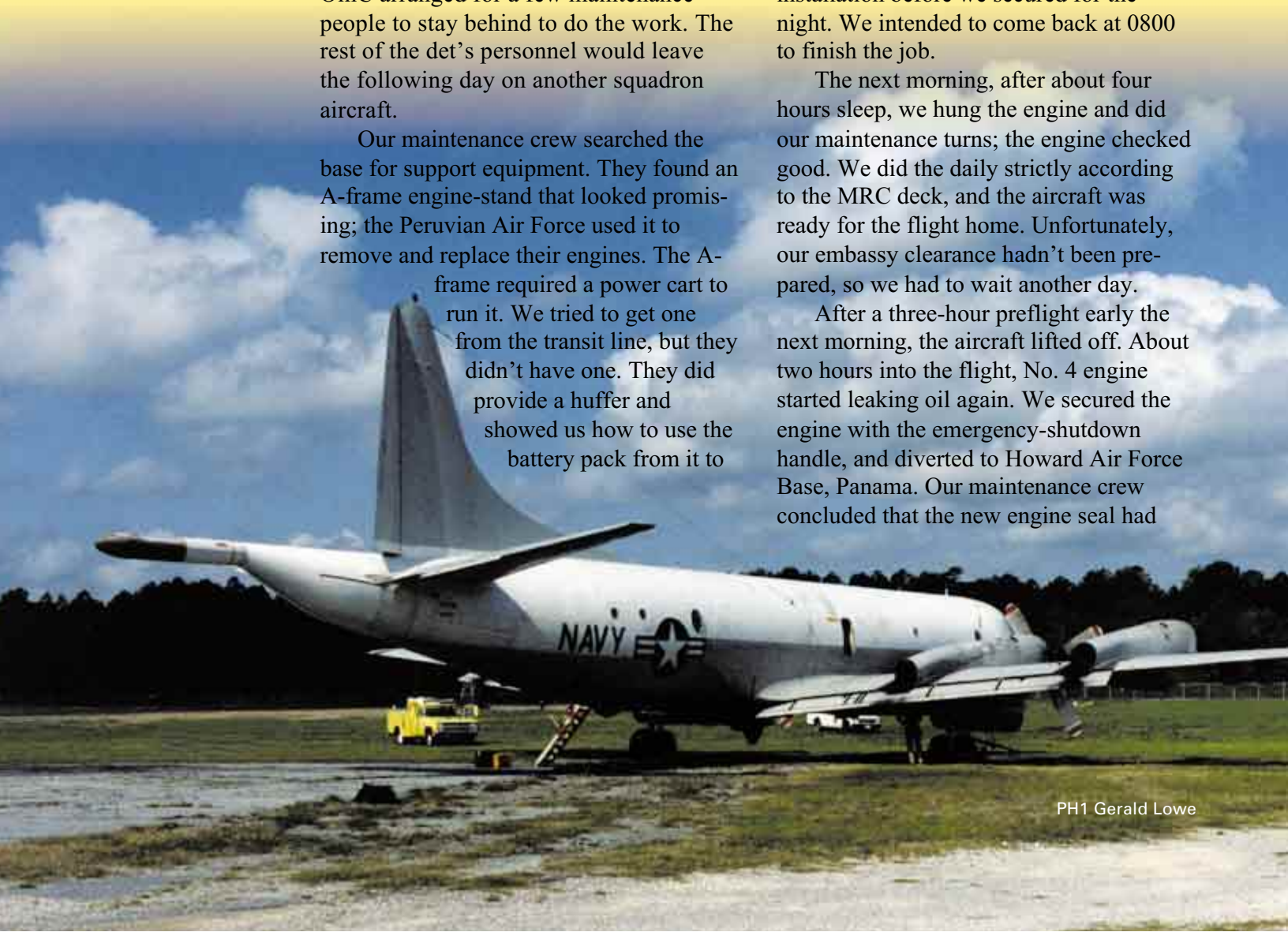
We isolated the leak to a bad seal, which meant we had to change a turbine. We called back to homeplate and learned that we could expect a new turbine and all the tools for the job in two days. The OinC arranged for a few maintenance people to stay behind to do the work. The rest of the det's personnel would leave the following day on another squadron aircraft.

Our maintenance crew searched the base for support equipment. They found an A-frame engine-stand that looked promising; the Peruvian Air Force used it to remove and replace their engines. The A-frame required a power cart to run it. We tried to get one from the transit line, but they didn't have one. They did provide a huffer and showed us how to use the battery pack from it to power up the A-frame. The next hurdle was the lack of lighting on the flight line. The solution to this problem wasn't the best: The Peruvian air force's electricians made a chain of power cords that reached all the way across the flight line.

We started working on our turbine at about 2000. We were tired and frustrated after repositioning the A-frame what seemed like 200 times, trying to make the light-cart work. We should have stopped for the night, but we pushed on. We finally managed to remove the engine, change the turbine, and position the new engine for installation before we secured for the night. We intended to come back at 0800 to finish the job.

The next morning, after about four hours sleep, we hung the engine and did our maintenance turns; the engine checked good. We did the daily strictly according to the MRC deck, and the aircraft was ready for the flight home. Unfortunately, our embassy clearance hadn't been prepared, so we had to wait another day.

After a three-hour preflight early the next morning, the aircraft lifted off. About two hours into the flight, No. 4 engine started leaking oil again. We secured the engine with the emergency-shutdown handle, and diverted to Howard Air Force Base, Panama. Our maintenance crew concluded that the new engine seal had

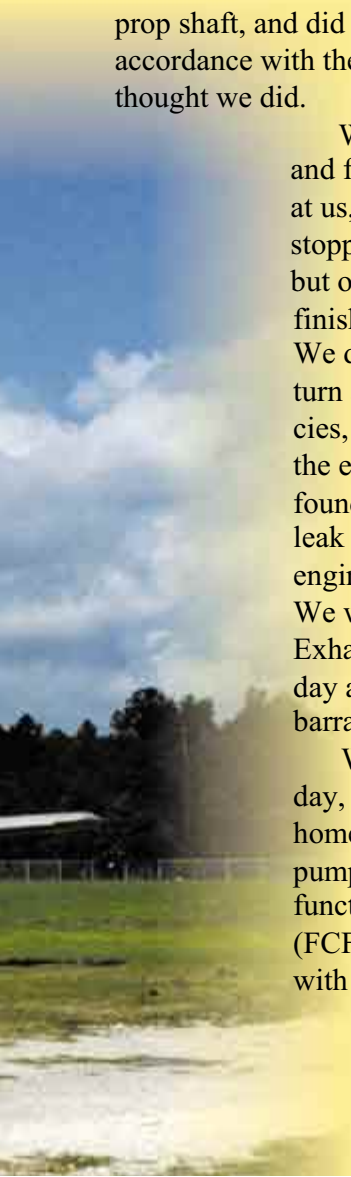


PH1 Gerald Lowe

Flight Home

failed, and that we would have to change the engine again. We wouldn't be going home yet.

The next morning, everything went almost according to plan. We moved all our components onto the new engine, turned in our old engine (non-RFI) to the host's hangar crew, and continued working on the new engine until we needed a torque wrench. As luck would have it, the host squadron was using the wrench for a tire change on a different aircraft. We waited two hours for the torque wrench before we could install our new engine. We re-installed the old propeller onto the prop shaft, and did the maintenance in accordance with the MIMs–at least we thought we did.



With time slipping away and frustration eating away at us, we should have stopped and taken a break, but our only thought was to finish the job and go home. We did a low-power engine turn and saw no discrepancies, but when we inspected the engine for leaks, we found No. 4 engine had a leak coming from the engine-driven fuel pump. We would have to replace it. Exhausted, we called it a day and secured to the barracks.

We hit it again the next day, confident of going home. We changed the fuel pump and launched for a functional check flight (FCF), which we completed with a prop-pump-one light on the No. 4 engine during landing rollout. The host's maintenance crew checked the aircraft on the deck and found the prop slightly over-serviced. They deserviced the prop, and the ground turns checked good. Our homeward-bound trip was scheduled to leave at 2000 hours. We finally were going home.

About five minutes after liftoff, the No. 4 propeller failed and pitchlocked. We made an emergency landing back at Howard AFB. During the postflight inspection, we decided we had a bad prop-control lip-seal because of too much prop fluid around the afterbody and the bottom section forward of the engine's oil-cooler intake.

When the aircraft landed around 0800, oil was streaming from No. 4 engine all the way aft to the tailpipe.

After removing the prop from the propeller shaft, the host squadron discovered the prop shaft's rear brass-cone was missing. That cone helps support the prop and prop control and keeps the rear seal seated. We were embarrassed when we found out we'd left the cone on the old engine's prop shaft, which had been towed away shortly after we'd removed it. Now for the third time, we had to replace the prop control and propeller because of the missing rear cone.

We had spent a lot of time and effort on the first engine change and still had made a huge mistake while installing the prop. Our heads were filled with thoughts of getting home. If we hadn't been in such a hurry, we could have saved all those man-hours and the assets we used on the second engine change. We felt relieved that nothing further happened on the FCF or the flight home.

PH2 Benjamin D. Olvey

AA William Stoker carries a chock for an SH-3 aboard USS *Saipan* (LHA 2). He's too close to that wheel, but the helo is being towed backward.

Wing-Walk

by AW1 Ian Peterson

The weight of the aircraft broke both her lower leg bones and almost every bone in her foot.

er Down!

It should have been a routine aircraft move from the line to the wash rack. No helicopters were turning, most turnarounds had been done, and qualified people were available to do the move. The director barked a few instructions, and everyone fell into position. Since I was new to the shop, I didn't have many plane-captain signatures so I fell in as the star-board wing-walker.

The director handed out whistles, hooked up the tow bar, called for chocks and brakes, and we were rolling. Only seconds elapsed between the director's last shouted command and the aircraft moving before an ear-piercing scream shattered the silence. By the time the driver reacted to the whistles and screams, 18,000 pounds of helicopter had run over the port wing-walker's foot. The main-mount was resting about halfway between her knee and ankle. Though only a few seconds, it seemed an eternity before the director reversed the path of the aircraft and backed it down the victim's leg and foot.

The port wing-walker had violated SOP for towing aircraft. She had tried to place the chocks in the cabin through the open cabin door while the aircraft was moving. The mainmount is just forward of the door, so when the aircraft began to move, it rolled over the wing-walker's foot and up her leg because she got too close to the wheel. It's fortunate the aircraft did not continue rolling up the wing-walker's leg and onto her body. The plane captain manual warns not to get closer than your own personal height to the mainmount when moving an aircraft. That policy ensures that if you trip or fall, you won't be in harms way.

The wing-walker was able to return to work in a few weeks, but only for light duty. The weight of the aircraft broke both her lower leg bones and almost every bone in her foot. She will be permanently disabled. It's hard to imagine that an aircraft moving three miles per hour on a wide-open flight line can be so dangerous, but it's happened before.

Sometimes the most mundane tasks are the ones that hurt you. There's nothing difficult about towing aircraft with trained personnel. This mishap occurred more than a decade ago, but I still read and hear about the same mistake being repeated. One of those mistakes killed a Sailor in a similar scenario a short time later. Will lack of attention bite us again?

AW1 Peterson flies with HSL-47 Det 6 aboard USS *McClusky* (FFG 41).

Note: *Five people have been killed by towed aircraft since 1988. Twenty-three more were hurt badly enough to qualify as Class B or C mishaps. Some chock-walkers don't believe mainmounts move fast enough to catch them–they're betting their lives on their speed.*

The rules are simple: Don't walk or stand forward or aft of a tire when the airplane is moving. If you're a chock-walker, walk next to the mainmount with the chocks in your hands, not slung over your shoulder or hanging from a sponson or bomb rack. –Ed.

Ten Seconds

It was warm and sunny on the flight deck of the USS *Constellation* (CV 64). We had been ready hours before the first launch of the day. Everything had been going great until we got the word about halfway through the first launch: "Change the second-event birds. The pilots are due to walk in twenty minutes." So, being highly motivated ordies, we got a quick plan together, readied our load crew and our AERO-9B Baker box.

With four of us on the roof, and the rest of our crew doing CAG-ARM duty, we felt we could handle anything. We downloaded an enormous load of five Mk-76s and one Mk-58 MLM. Then we had to get the multiple ejector rack (MER) to the replacement aircraft on the other side of the flight deck and load that aircraft.

That's when our plan started coming apart. Mistake number one: Instead of us placing the 255-pound MER on the AERO-83/A "MER Tree," we decided to carry it from the top of cat 2, over to the other aircraft on the starboard point, forward of elevator No.1. We could see an E-2C taxiing to cat 1, and another aircraft taxiing off cat 2 and lining up behind the Hawkeye. As we made our way to the cat 1 JBD, we realized we were caught between taxiing aircraft. The only way out was back the way we had come. Of course, we could wait for the JBD to raise and cross behind the Hawkeye before it went to full power. You guessed it – we convinced each other to go for it and cross behind the JBD.

# of Guesswork

by AO1 Jeffrey Vochatzer

Mistake number two: As we crossed behind the JBD and squeezed past the Hornet, we could hear the Hawkeye going to takeoff power. The wind generated by the E-2 tried to blow the MER away; we wanted to scatter in different directions. We were well clear of the FA-18, but now we had an S-3 spotted on elevator 1 where we were headed. Thanks to the quick reaction of several people who came to our aid, we avoided crunching the S-3 with our battering ram.

As we made our way to cat 1 JBD, we began to realize we were caught between taxiing aircraft.

It was a quick, eye-opening experience – a painful 10 seconds of guesswork. We were all grateful to escape with only minor scratches and no damaged equipment – just faces red enough to match our jerseys. We sat down and discussed what had happened and just how quickly the flight deck environment changes. We not only put ourselves at risk, but also the people who had come to our aid.

Petty Officer Vochatzer is assigned to VFA-151.

Spotty Passdown Spoils Prop

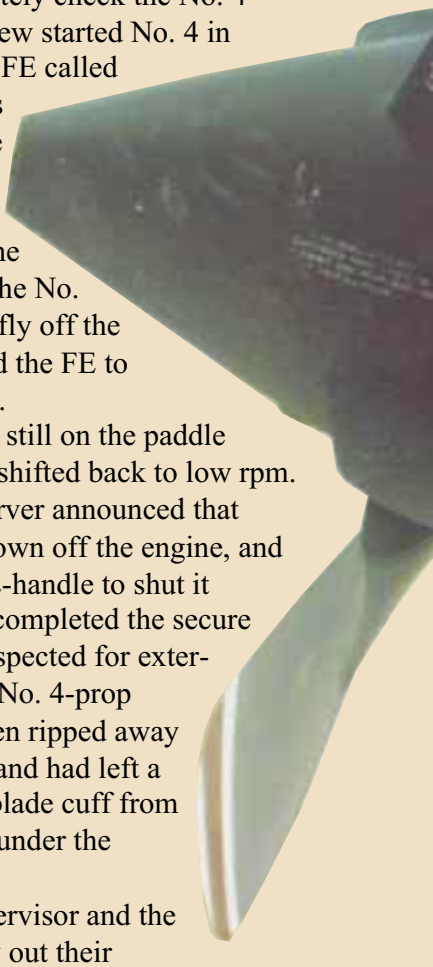
by Lt. Curt Miller

Maintenance control tasked two AE3s to do a static check on the No. 4 propeller of a P-3. When they arrived at the aircraft, the maintenance technicians saw that the prop had been feathered and the afterbody placed on top of it. The AEs had trouble unfeathering the prop during voltage and resistance checks and called maintenance control for help. Maintenance control sent two AD3s to troubleshoot.

Once the mechs unfeathered the prop, the AEs returned to the aircraft. The mechs asked them to slide the afterbody back into position after they'd completed their maintenance since it looked like it might rain. The mechs planned to secure it after the electricians had finished their part of the check.

When the AEs were finished, they positioned the afterbody and went looking for the mechs. They told the mechs' shift supervisor that the afterbody was in place but not secured. The shift supervisor, distracted by maintenance on several other aircraft, forgot to write in the mid-check pass-down log that the No. 4 afterbody had to be secured before turning up the engine. Instead, the pass-down read that the aircraft was ready for engine turn.

Several hours later, maintenance control directed the duty crew to do engine turns on No. 1 and No. 4, the final check for propeller maintenance. Mid-check's duty flight engineer (FE) did a preflight but didn't adequately check the No. 4 afterbody. The crew started No. 4 in low rpm, and the FE called a normal start. As the FE shifted the engine to normal rpm, the lineman and observer in the copilot seat saw the No. 4 prop afterbody fly off the aircraft. They told the FE to secure the engine.



His hand was still on the paddle switch so the FE shifted back to low rpm. The cockpit observer announced that something had flown off the engine, and the FE used the E-handle to shut it down. The crew completed the secure checklist, then inspected for external damage. The No. 4-prop afterbody had been ripped away from the aircraft and had left a 6-inch chunk of blade cuff from No. 4 prop lying under the nacelle.

The shift supervisor and the FE failed to carry out their responsibilities for a complete pass-down and preflight. They were the major links in the chain of events that allowed us to damage a propeller. Ground-crew coordination training must be more than just another program, and the skills learned must be practiced daily.

Lt. Miller flies with VP-30.

…the lineman and observer in the copilot seat saw the No. 4 prop afterbody fly off the aircraft.

This Sailor is locking down an afterbody. If you forget to do that before turning up the corresponding engine, you can plan on replacing the propeller.

Flight-Control GUILLOTINE

by AMS2 Patrick J. VanElzen

The rudder of a Hornet can remove your hands as cleanly as a guillotine when the flight controls move under hydraulic pressure.

A near miss with an FA-18C rudder changed my attitude about taking shortcuts.

Our supervisor ordered another Sailor and me to change a horizontal-stabilator actuator – a routine removal and replacement that I'd done many times. After installing a new hydraulic actuator, we needed to op-check the system. Bringing the engines on-line would give us enough hydraulic pressure to operate the flight controls.

Before the low-power-turn operator started the engines, we held a thorough brief to make sure everyone knew what to expect. We especially covered safety procedures before anyone touched the first switch in the aircraft. After the brief, the operator brought the engines on-line.

With hydraulic power applied, we checked the horizontal-stabilator actuator by starting the built-in tester (BIT) unit. We looked at the stabilator's alignment and tested the Hornet's back-up flight-control mode. That's when we checked to see if the leading edge of the stabilator lined up with a specific rivet on the skin of the aircraft. This Hornet needed a large adjustment.

The back-up mode's mechanical linkage has a lollipop (bolt and nut assembly) for adjusting alignment. To reach the lollipop, I climbed on the aircraft and walked back between the vertical stabilators. I signaled the plane captain, who was standing in front and to one side of the nose, that I wanted to make an adjustment. He signaled the turn-up operator to keep his hands out of the cockpit to make sure none of the flight control surfaces were moved. After several adjustments, I finally got the stablilator aligned.

Next, we checked the switching valves to ensure hydraulic pressure would be available in case of an engine failure. Then we shut down No. 1 engine. In my haste to finish the job, I reached down past the offset rudder under the vertical stabilizer and tried to insert a cotter-key through the lollipop while hydraulic power was still on the jet. I didn't notice my squadronmates beside the jet trying to warn me of my mistake; I had placed myself in real peril.

Had my reaction been a split-second slower, I would have lost both arms just below the elbow.

In the FA-18, as hydraulic power slowly bleeds-off, the flight controls often cycle without command. Now was no exception. The rudder suddenly struck my right arm, and I immediately pulled my arms out of the actuator-access panel. Had my reaction been a split-second slower I could have lost both arms just below the elbow.

In my haste to finish rigging the airplane, I hadn't told the plane captain what I was doing. That simple mistake could have ended my naval career and left me disabled for life.

Don't take chances with machinery. If a hydraulic system and its flight-control mechanisms have a little life left in them, keep your hands to yourself.

Petty Officer VanElzen is a metalsmith assigned to VFA-105.

Petty Officer Risner found it impossible to measure the damage with the oil-cooler return-line installed on the aircraft.

Qualifications Don't Make You Right

by A02(AW/NAC) Todd Risner

Working on nightshift, I'd been assigned to find the source of an oil leak on our detachment's HH-46D's aft transmission. We'd been troubleshooting the same gripe for more than four hours without getting anywhere when we decided to pull the mix-box bolts' access panel. We wanted to see if there was any fluid leaking from the transmission's oil-cooler return-line.

Once we'd removed the access panel, another technician and I discovered that the return line had been chafing on a rigid utility-hydraulic line. Both of us were merely CDIs; therefore, we asked a CDQAR to inspect the line. The CDQAR looked at the lines and said, "The chafing is bad, but not bad enough to 'down' the aircraft."

I wasn't satisfied and asked for a second QAR's opinion. He also felt the chafing wasn't bad enough to down the aircraft. He suggested we look it up to be sure, then measure the chafing to verify whether or not it was out of limits.

It was impossible to measure the damage with the line installed on the aircraft. After several unsuccessful tries, we removed the line to get an accurate measurement, which was .032 inches. We checked our findings against table 9-1 in the NA Ol-lA-20, which showed the chafing limit for the line to be .006 inches. This damage was not just beyond the designated limit; it was way beyond it.

Once we removed the line from the aircraft, we could see several damaged layers of steel laminate that hadn't been visible while the line was installed in the airframe. The transmission-oil line that the hydraulic line had been chafing against was also severely worn; we wrote a discrepancy against both. When we presented our findings, maintenance control downed the aircraft.

If you find a problem, stick to your guns. Use the MIMs to strengthen your position, and be sure everyone follows inspection procedures correctly. Material reliability is an important concern in maintenance, and even the most qualified maintenance people can make mistakes.

This damage was not just beyond the designated limit, it was way beyond it.

Petty Officer Risner is a search-and-rescue aircrewman, and a CDI for power plants and airframes with HC-6 det 2.

How long would it take for these lines to wear through from vibration and cause the transmission to fail or the hydraulic pump to cavitate?

Whom Do You Trust?

by AMS1 William McLeod

Two metalsmiths from AIMD (an AMH2 and an AMH3) visited a local squadron to inspect the steering collar on a Tomcat's nose landing gear as directed by accessories bulletin (AYB)746. Both technicians had done this job many times; they were comfortable with it.

The detailed instructions in the AYB require the squadron to prepare the aircraft for AIMD's inspection. They have to jack the F-14, deflate the strut, remove the launch bar bungees, remove the launch bar, and get the strut ready for the visitors.

The force of 1,500 psi of nitrogen releasing from a strut is explosive. An aircraft wheel coming apart can crush your chest and tear off your face at a mere 375-psi. It's happened.

Arriving at the squadron, the two metalsmiths went to maintenance control. The maintenance control chief told them the aircraft had been prepared and was waiting for them.

Without verifying the squadron's preparations, the AMH3 went out to the aircraft to begin the job; the AMH2 stayed behind to look at the records and get the paperwork for the task.

The AMH3 followed the I-level part of the step-by-step instructions and removed the safety wire and two packing-nut lock-bolts from the gland nut. The AMH2, now on the scene, helped the AMH3 back off the nut. Both technicians noticed the gland nut was very hard to back off, but assumed the problem was caused by sealant on the threads. When the gland nut reached the last thread, the nut and steering collar exploded downward from the force of the 1,500-psi nitrogen charge on the strut. The steering collar snatched the spanner wrench and the AMH3's hand with it. After breaking his wrist, the wrench continued downward, hitting his foot and bruising his ankle. Our AMH3 was lucky to escape with only minor injuries.

The steering collar exploded downward and snatched the spanner wrench.

Several elements contributed to the incident. The squadron didn't follow the AYB's instruction to deflate the strut. Furthermore, the instructions did not include an I-level step to ensure the strut had been deflated. The I-level technician did not verify this precaution.

Operational risk management (ORM) was never used in this job; routine tasks will continue to be dangerous until ORM becomes second nature. You have to do your own pre-checks because no one cares more about your survival than you do.

Petty Officer McLeod is a QAR and safety petty officer at AIMD Oceana.

Almost Overwhelming Odds

by Capt. Michael Bryan

These Marines wrestled a 20-by-75-foot section of fiberglass parking ramp to a standstill in high winds to protect their squadron's Hornets.

Mother Nature surprises us from time to time when she attacks us with our own creations. Such was the case for nine Marines who went in harm's way against an enemy they could neither see nor hold – a windstorm. – Ed.

During a deployment to the Marine Corps Air Combat Center at Twenty-nine Palms, California, nine Marines were surprised when high winds lifted a 20-by-75-foot piece of fiberglass matting off the deck and blew it toward their squadron's aircraft. Without hesitation, the Marines ran toward the airborne matting, and jumped on it to stop the sheet from damaging aircraft. All nine Marines were dragged several yards, and one was lifted six feet off the ground. They didn't give up, despite what seemed to be a losing battle.

By the time the wind momentarily settled down, the huge section of matting was just inches from parked aircraft. One Marine was standing on top of a Hornet, holding the matting off. When other squadron members saw what was happening, they ran out to help. It took 50 Marines and an aircraft tow-tractor to overcome the force of the wind on such a large object.

Working as a team, the original nine Marines (in photo above, left to right), LCpl. Jason Contreras, LCpl. Henry Lopez, LCpl. Trevor Spence, Cpl. Carl Himes, Jr., Cpl. Juan Buractoan, Sgt. Jonathan Avendula, Sgt. Brandon Cook, Sgt. Bradley Flanagan, and SSgt. Derrick Torrence, prevented damage to several multi-million-dollar aircraft.

Success would not have been possible without the help of fellow squadron members, but the selfless action of the original nine Marines stopped the matting long enough for help to arrive. The worst injury was a minor rope burn.

In recognition of their Herculean effort, the command awarded these Marines the Navy and Marine Corps Achievement Medal the following day. LtCol. William Miles, VMFA-232's CO, felt their rapid and decisive actions deserved equally rapid recognition.

Capt. Bryan is a pilot and the power-line division officer at VMFA-232.

Lt. Catherine E. Wilson

Why'd It Sink?

by AD3 Frances A. Nievera

About noon, I was delivering a Mk-30/48 training shape by forklift to the western helicopter pad at a NALF. Our aircrews use the shape to practice recovering targets and torpedoes off the coast of San Clemente Island.

On the way to the pad, I saw one of our helos on the taxiway, so I turned the forklift and headed for the shoulder of the taxiway. I was driving backward like you're supposed to. When I crossed onto the asphalt just off the taxiway, the forklift rolled over a small taxiway light that stuck above the ground about an inch or two.

Forklifts don't have shock absorbers, so the forklift hit the bump hard. The cage carrying the practice shape rocked, and its straps stretched enough to allow the cage to tilt on its heavy side, even though I had made sure the straps were wrapped tight before I started.

Then, everything seemed to switch into slow motion. First the cage tilted, and the shape slid. Then the cage tilted again, and 2,700 pounds of shape slid out and rolled onto the ground.

The maintenance chief and a QAR inspected the shape. Nothing appeared

damaged, and no one was hurt, so we loaded it back into the cage, using a second forklift, and sent it out to the pad for the aircrew to use on their flight.

The aircrew took the cage and shape, practiced with it in deep water for about 20 minutes, but then it sank. The shape wasn't expensive enough to require a mishap report, but HC-85 later used the incident to teach how operational risk management (ORM) should be used.

Here's what should have happened if we had used the five steps of the ORM process once the shape hit the ground. Driving the forklift as I did would have required a more time-critical version.

Identify the hazards: The training shape could hit other objects during transport.

Assess the hazards: Dropping a 2,700-pound shape on the ground may damage it. Damage could make the shape leak, which means it might sink.

Make risk decisions: Inspect practice shape for damage. Test it for leaks, even if it means canceling training. The training was not urgent.

Implement controls: Require rigorous inspection for any equipment damage. Test the practice shape under controlled shallow-water conditions.

Supervise: Involve contractors who are familiar with practice shapes. Train command personnel and develop an inspection program for shapes. Allow for special inspections when needed. Have QA and safety department follow up on controls.

We relearned some basic lessons in this incident. First, preflight your equipment before you use it, and inspect it regularly for wear. Report discrepancies immediately. Then check the straps and load before you drive. Make certain the load won't shift. Stop and recheck if conditions change.

Drive support equipment carefully, and be aware of even small bumps. Stay alert and drive at the slowest reasonable speed. Take care to carry the load at the correct height, and if you should drop it, get a qualified person to check that the load is still safe to transport.

Lt. Wilson and Petty Officer Nievera are assigned to HC-85.

…all 2,700 pounds of the shape slid out and rolled onto the ground.

The Mk-2 (helicopter weapon-recovery system) and training shape are transported by forklift, which will react violently to even the smallest bump.

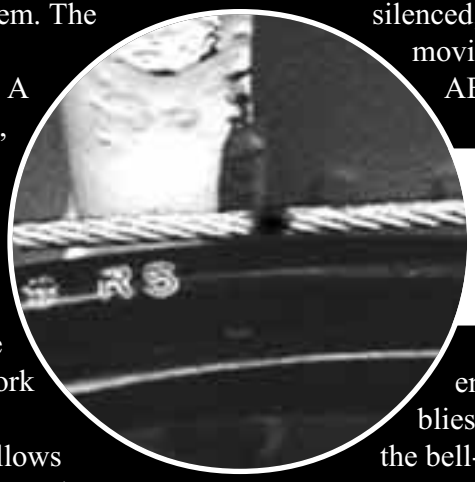
Nightcheck

This incident dumbfounded most of our supervisors: Two people accomplished in only a few minutes what two shifts couldn't – a remarkable feat.

Every evening, nightcheck crews everywhere take responsibility for providing enough "up" aircraft to fly the following day's missions. This night, the squadron's nightcheck crew needed to fix a Hornet that had returned from a flight with a problem. The pilot's MAF simply said, "Binding flight controls." A QA rep talked to the pilot, who said, "I felt a momentary jam in the controls when I rolled to starboard in a moderate climb."

Aviation maintenance is demanding, but teamwork lessens the demands and creates the synergy that allows seemingly impossible tasks to be accomplished. Maintenance control downed the FA-18, and troubleshooters removed the cowling. They did an end-to-end inspection of the entire flight-control system. More testing, following the MIMs, gave negative results. It was well understood in the squadron that MAFs for binding flight controls never are signed off "not duplicated on deck" (A799). This Hornet did not fly the next day. A more intense investigation would be undertaken the next night of troubleshooting. That's when AMS2 Jeanette Moore and AE3 Scott Mason's supervisors assigned them the job.

AMS2 Moore climbed into the cockpit late that night after all other jets had been silenced; she systematically began moving the flight control stick. AE3 Mason had removed enough electronics assemblies to allow a better view of the bell-crank and the flight-control cables. He heard a faint sound coming from the panels aft of where he was working. He stopped removing parts and began looking, touching and listening. Opening the next door aft, he found a lightly chafed antenna cable. He immediately informed AMS2 Moore.



There was a single drop of epoxy directly under the site of an old repair (arrow) and close to the broken clamp.

AMS2 Moore looked at the chafing, and although she realized how serious this problem could be, she also recognized that it alone could not have caused the flight controls to bind. Using the 18-inch rule,

Can Hack It

by ATCS David L. Zagorodney

she spotted a broken plastic clamp holding the air lines to the air-data computer (ADC). Again, very interesting, but alone, not capable of jamming the flight controls. Softly touching the backside of the control cable, she found a drop of epoxy from a repair above the cable done at some earlier date. This was the last piece of the puzzle. The mystery of the hard-to-find jammed flight control had been solved by teamwork.

So what had happened? Over time, the antenna cables migrated into the flight-control cables, slowly pushing them against the clamp. The single drop of epoxy, not noticed during previous maintenance, was now a burr on the backside of the flight-control cable. When the epoxy burr ground against the ADC clamp, the pilot applied extra force to his control stick, broke the clamp, and unintentionally concealed the cause of his plight.

Senior Chief Zagorodney is QAO on a det from Strike Fighter Wing Pacific.

The mystery of the hard-to-find jammed flight control was solved by teamwork.

AE3 Scott Mason and AMS2 Jeanette Moore found the cause of intermittent binding of flight controls.

The huffer getting fished out of the water was neither locked nor chocked after starting an E-2C on the seawall. The ground crew disconnected the huffer from the E-2C; the aircraft went to high-power and blew the huffer into the bay.

Attack of the Yellow Gear

by Kevin Mattonen, Cdr., USN, Ret.

After finishing another annual cycle of visits, our survey teams identified what is becoming our biggest enemy and most likely to crunch airplanes–yellow gear. On a recent visit, the day after we'd presented our maintenance malpractice brief with its graphic descriptions of deadly aircraft moves, my team members had to step in and stop a move. What was wrong with it? For starters, chocks were draped over a pylon, whistles were not in mouths, and the taxi director was riding in the tow tractor with his back to the move.

The cost of yellow-gear crunches went up nearly 400 percent from 1997 to 1998.

That's not all that bothered me. The line chief looked out and slunk back into the hangar without saying a word. Then the move proceeded through a FOD walkdown where a number of people in khaki stopped long enough to get out of the way but never lifted a finger to stop the move.

We've racked up $1.3 million in damages to airplanes by support equipment in the past four years. The cost of yellow-gear crunches went up nearly 400 percent from 1997 to 1998. At that rate, we'll be paying more than a million dollars a year in just two years, and that's not money we're budgeted to spend.

What baffles me is that the big-wing communities (P-3, C-9, C-130, E-6) are committing the most flagrant fouls, which defies logic. These airplanes aren't small, they don't hide well, and they are not doing the flight-deck ballet.

Who's driving those spiffy little tow tractors? And who's watching the drivers? My people routinely see these guys not just going too fast, but rolling along at

their tugs' top end-speed with no regard for what is being towed. You'd think it a sufficient wake-up call when a Richard-Petty wannabe towed a B-5 stand behind his NC-2 and did more than $1,700 damage to the wing commander's car at an NAS. But no, we still see the same mistakes over and over again.

The best one yet has to be a young gent dragging homemade support equipment, arcing and sparking across the ramp. He finally figured out the equipment had no wheels–after the jury-rigged towing attachment snapped, and the mystery stand went screeching across the ramp–that's when he realized he had to find a better way of doing business.

We're better than this. Let's step in now and stop the waste. Officers, put out the word. Chiefs, get out and lead the way. These moves have to be by the book. Our people are ignoring the rules, and somebody is going to get killed.

Mr. Mattonen, Cdr., USN, Ret., was an aviation analyst at the Naval Safety Center.

LETTERS

Class A Mishaps

Mech January-March 1999
Air Wing Toolbox
By Joe Casto

The mishap aboard USS *Enterprise* (CVN 65) on Nov. 8, 1998 claimed the lives of four Prowler aircrewmen who were my shipmates and destroyed an EA-6B and an S-3. Contrary to *Mech*'s assertion that "burning fuel and debris destroyed three Hornets," thanks to heroic firefighting efforts by ship and air wing personnel, no other aircraft were destroyed. Two of the reportedly destroyed FA-18s are flying daily with CVW-3, and the third is being repaired. Please try to stick to the facts. The fleet depends on you for both information and accuracy. Sensationalism, we can find elsewhere.

LtCol. S. M. Pomeroy
Commanding Officer, VMFA-312

I misread the damage from a computer readout and printed it the way I read it; it disturbs me to realize I was so far off the mark. I will do my best to win your confidence in Mech*—sensationalism is not our stock in trade.–Ed.*

Cover Photo

Mech, July-September 1998
By PH2 Felix Garza

The Sailor on the cover of the July-September issue is my son, AO3 Steve R. Glave.

He is assigned to VFA-195 aboard USS *Kitty Hawk* (CV 63). My wife, Melody, and I are very proud of Steve and everyone in the military for their efforts, day in and day out, to keep our great country secure. We fly the American flag in our yard for them and those before them.

Kenn W. Glave
Executive Travel
Houston, Texas

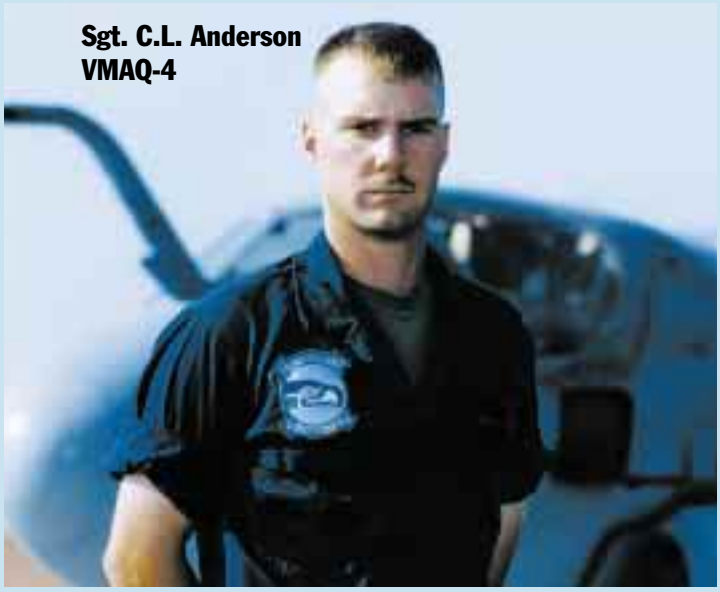
Thank you for identifying the Sailor on our cover. We've sent three magazines to you.–Ed.

Mech and Approach Magazines

We get so busy looking at what's wrong that it's easy to miss what's right. What's right by me is how you're doing *Approach* and *Mech*. Both are way improved over what I read up through the early nineties, both in packaging and content. I was a little ashamed when I first found out in '85 that the other services got our magazines–now I'd proudly compare them to anyone's. We can now get *Approach* and *Mech* on the web as well as in print; the people who put them together deserve a big thanks from the operators.

Cdr. Steve Lilly
CNAP

Bravo Zulu

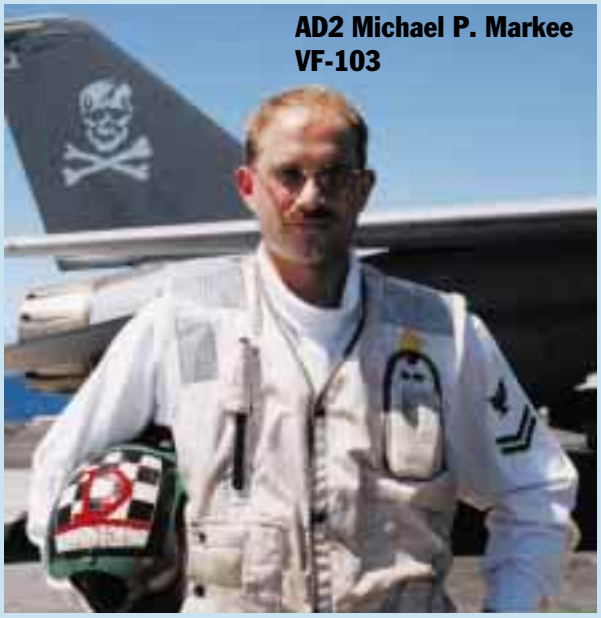


Sgt. C.L. Anderson
VMAQ-4

Sgt. Anderson (a power plants and line supervisor) and his crew were removing an engine from an EA-6B and lowering it with two HLU-288 bomb hoists. He heard an unusual noise, stopped work and inspected the forward bomb hoist cable and attaching points. Two strands of the cable had severed 4 inches below the engine mount, and the remaining cable was about to break.

Sgt. Anderson cleared everyone away and told a Marine to put a weapons loader under the engine until they could replace the bomb hoist.

Had the cable broken, the engine would have fallen 4 feet, been damaged and might have injured the maintenance crew.



AD2 Michael P. Markee
VF-103

AD2 Markee, a final checker aboard USS *Dwight D. Eisenhower* (CVN 69), noted a small amount of hydraulic fluid coming from the port nozzle of Victory 116 as the Tomcat went into tension for launch. He immediately suspended the launch and downed the aircraft. Troubleshooting further, he found a crack in the port rudder-actuator assembly.

Had AD2 Markee not stopped the launch, the aircraft would have had an airborne emergency. Given the location of the crack and how close it was to the flight-hydraulic system, it could have caused a complete hydraulic failure.

AME2 Kristoffer C. Drew
VS-29

During the alert launch of an S-3B Viking aboard USS *Carl Vinson* (CVN 70), AME2 Drew pulled an E-2C mechanic away from the intake of the Viking's No. 2 engine. Immediately thereafter, he pulled a plane captain away from the same engine. An E-2C turning up close by was compounding the situation, making it equally dangerous for both ground crews.

After the recovery and shutdown of Dragon 55, an AV-8B assigned to HMM-268(REIN) onboard USS *Tarawa* (LHA 1), Sgt. Lyda noticed smoke coming from the rear (or "hot nozzles") of the Harrier. Looking closer, he saw a small amount of fluid had pooled in the hot exhaust section and was on fire.

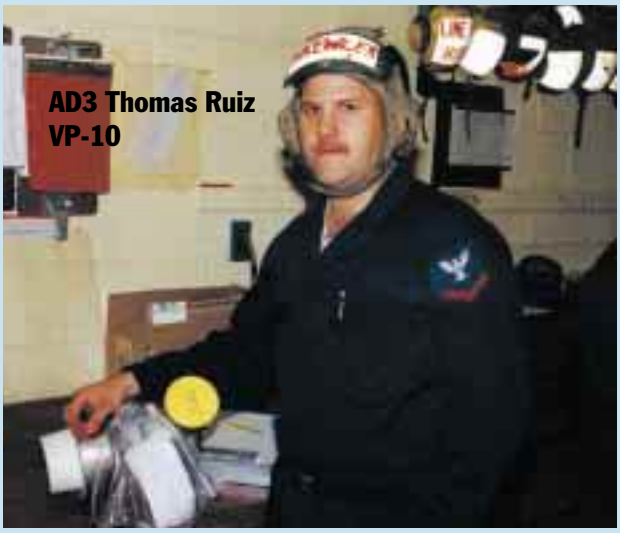
Sgt. Lyda ran to the front of the aircraft, climbed into the cockpit and dry cycled the engine to extinguish the fire. The fluid was from an engine-oil leak. Sergeant Lyda's quick response stopped a potential flight-deck fire.

Sgt. T. E. Lyda
HMM-268(REIN)

AMS1 John Kalka
VP-8

Preflighting an Orion with a student flight engineer, AMS1 Kalka found a subtle but dangerous discrepancy. Someone had incorrectly installed the cooling door for an engine generator. The door, normally open during engine operation, was closed and rigged backwards. Undetected, the misrigged door would have made the generator overheat and catch on fire, thereby causing an in-flight emergency.

The command designated Petty Officer Kalka safety pro of the month for January 1998 for his discovery.



AD3 Thomas Ruiz
VP-10

AD3 Ruiz was doing a daily on a P-3C Orion. While inspecting No. 1 engine, he found a loose cannon plug on the back of the air-turbine starter. Looking closer, he found a centrifugal switch, that disengages the starter upon reaching 64-percent RPM, had separated from the starter casing. Petty Officer Ruiz promptly told the maintenance-control chief, who ordered the loose cannon plug and centrifugal switch reattached.

If PO Ruiz had not discovered the problem, a subsequent engine start could have resulted in a catastrophic air-turbine starter failure. Shrapnel from the failed starter could have severely damaged the engine, aircraft fuselage and injured nearby personnel.

CROSSFEED

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AMCS(AW/NAC) Darryl Dunn
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ALSS

The Little Things Will Get You

by PRC(AW) Bill Yeager

Aircrew, before your next preflight, look through the pockets of your flight suit and G-suit and see what you find. Next, look in your helmet bag. Take out the maps, the PCL, the kneeboard, and other needed items so you can see way down in the bottom, to the Milky Way wrappers and the little yellow ear plugs you wore back in the late eighties. You will find items that can not only make an aircraft engine useless but also waste the many man-hours that QA inspectors spend searching for cockpit FOD.

Sure, you zip up pockets, snap up sides, and strictly comply with all the directives issued by your squadron, wing and TYCOM that govern the FOD program, but are you really covering all the bases?

Think of all the tool inventories that maintenance technicians go through to do their jobs. Perhaps you should make the time to check the contents of your G-suit and helmet bag, as well.

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

PRs – How's Your Color Vision?

by PRC(AW) Bill Yeager

Several conditions can prevent a PR from handling ordnance, but poor vision is the most common. Parachute riggers (PRs),with few exceptions, must be certified to handle explosives. Recent concern about vision standards for PRs is supported by statistics that show 15 percent of fleet riggers have trouble seeing some colors or shades.

Color-or shade-blind people cannot be certified per MANMED (the Manual of the Medical Department). Failing the military color vision tests may not be the end of the world or your career. MANMED also states, that if you can distinguish colors of traffic signals or other devices showing red, green and amber, you still may be qualified.

The NAVSEA OP 05 outlines the requirements, the MANMED outlines the type of physical required, and OPNAV instruction 8023 requires qualification. If you handle, inspect, or transport CADs or flares, you must be certified to the correct level.

The Bureau of Naval Personnel changed the requirements for people entering the PR rate after March 1997. For PRs who joined the Navy prior to this change, this requirement could seriously affect your career.

SEATS and ICAPS Aren't Just for PRs

by PRC(AW) Bill Yeager

Fleet surveys find very few avionics work centers document ALSS pool assets with SEATS (Survival Equipment Asset and Tracking System) records. However, PR shops at the organizational level and 800 divisions at the intermediate level use SEATS-generated forms for tracking and documentation.

AIMDs are tasked to use the SEATS/ICAPS (Increased Capability) program to manage ALSS correctly. However, survival radios, night vision

devices, and other electronic-ALSS pool items are leaving AIMD work centers without SEATS history cards.

You can manage ALSS and track and report installed explosive devices with the SEATS/ICAPS program, generating a record of inspection and configuration for all ALSS components.

Quality assurance reps and avionics supervisors can get SEATS training from their PR shops or 800 divisions. Consult the SEATS user's guide and OPNAVINST 4790.2G for guidance. Chapter 13, authorizes using computer-generated SEATS history records for aviation life support systems.

Did You Check It? I Didn't

by Ens. Mike Fleshman

When we hear about a mishap that damages equipment or hurts someone, it's often caused by a lack of attention to detail. I came across a good example while reading the morning messages.

While inspecting an uninstalled MK-GRU7-1 ejection seat before disposal, technicians discovered two live MK 13 MOD 0 signal flares in the seat pan and both MW19 SEAWARS attached to the parachute harness. The twist on this event is that the ejection seat had been stored in a wooden shipping container since 1994. The command with the responsibility for disposal asked that the seat be inspected for ordnance before shipping it.

The AESR logbook contained no entry certifying the seat was ordnance-free. Further review of the logbook indicated the only entry made for this ejection seat was its transfer from one activity to another.

Obviously, the technicians who did the shipping and receiving inspections did not inspect the seat or were not familiar with installed ordnance devices. Any activity that ships or stores an ejection seat must be sure all ordnance is removed from the seat, parachute, and seat pan by certified personnel. Also log an entry in the AESR certifying the seat is ordnance free.

The people at the command that had to dispose of the seat were conscientious enough to request an inspection. Otherwise, technicians unaware of the ordnance might have been injured during the disposal of the seat.

Ens. Fleshman is a maintenance analyst at the Naval Safety Center. He was commissioned 1 March 1999; he is a former AMEC(AW).

AVIONICS

EMI – An Invisible Enemy

by AEC(AW) Robert Tate

The Gulf War was full of examples of how precise we can be with our "smart" weapons. Before we gloat, however, let's not forget that any system can be defeated by mediocre maintenance, which is one cause of electromagnetic interference (EMI).

EMI has many other causes, such as electrostatic discharge, high-powered microwaves, and radio-frequency energy. As a result, naval aircraft are designed with a certain degree of "hardness," a measure of how well the aircraft's electronics can withstand electromagnetic interference. The techniques used to increase hardness are bonding, grounding, shielding, and filtering. Over time, corrosion, vibration and poor maintenance degrade the EMI protection gained through these techniques.

During safety surveys, our analysts see corrosion on grounding surfaces and loose connections. If these conditions are not corrected, EMI can cause strange and dangerous things. A ship's radar has made torpedoes fall from helicopters. Micro-switches have burnt out on aircraft aboard CVNs. Flight control surfaces of both rotary- and fixed-wing aircraft have actuated without command.

The keys to beating this invisible enemy are vigilance and training. Avionics technicians must have formal training on EMI and its causes. The place to start for training is your

type wing, then the TYCOM, and finally NAVAIR.

The CDI, QAR and work-center supervisor are key players in combating maintenance malpractice, but the trained technician is our first line of defense in overcoming the effects of EMI on our weapons systems.

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

LINE

Washing Aircraft on the Fly

by PRC(AW) Bill Yeager

Washing an aircraft reduces corrosion, improves aerodynamics, and makes the bird look great. But this job is undeniably dangerous, and, in most cases, done by our least experienced personnel.

Here are some typical mishaps: A plane captain straddling the folded tail section of an H-53 fell and broke his ankle. An airman lost some fingertips to a P-3 when a second airman extended a ladder the first airman had been cleaning. A plane captain severely injured his legs and feet when he slipped off the wing of a C-130 and fell 18 feet. An airman fell off the horizontal stabilizer of a Hawkeye and injured his face and shoulder. An H-60 pilot burned his eyes during an all-hands aircraft wash in port.

These mishaps have two common threads: dangerous cleaning compounds and wet and slippery surfaces. These hazards, coupled with the sizes and shapes of the airframes themselves, make washing aircraft a very hazardous task.

A leading airman generally supervises wash jobs. In most cases, the only time you see a "crow" on the wash rack is when the wash is about to be inspected by a CDI. Some washes are done without the correct use of PPE and cleaning compounds.

On your next training day, break out the MRC deck and review the procedures. This precaution, along with increased vigilance on the part of your wash party, will reduce the chances for a mishap.

MAINTENANCE MANAGEMENT

Here's Looking at You

by ASCS Edwin Guerra

Our safety surveys give commanding officers a snap-shot of the "health" of their squadron or AIMD based on how close it conforms to the Naval Aviation Maintenance Program, (OPNAVINST 4790.2G), and other instructions. They should not be compared to Immediate Superior In Charge (ISIC) inspections, because the relationship of the Safety Center's survey team to the surveyed unit is that of a consultant to a client.

Safety surveys differ from ISIC inspections in four major ways. First, the CO must request our services. Second, we do not give grades during a survey. Third, the survey process is interactive; we ask questions such as, "Why do you do it that way?" (There might be a good reason). When areas of concern are identified, we conduct training and point ways to get back on track. Finally, as a matter of policy, the results of the survey are not releasable outside your command. (Waivers to this policy are only at the express direction of Commander, Naval Safety Center.) Therefore, the results of the survey are briefed only to the surveyed unit's commanding officer.

The next time the opportunity for a safety survey arises, please take advantage of our services. Copies of the checklists can be downloaded from the Naval Safety Center homepage: www:norfolk.navy.mil/safecen, or by contacting any of the personnel listed in the box below at (757) 444-3520 (DSN 564). You can also e-mail

us. We are available to help you with any aviation maintenance program.

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

POC:	Branch	Ext.	e-mail prefix @safecen.navy.mil
LCdr. R. Sanders	Division Head	7265	rsanders
PRC B. Yeager	ALSS	7289	byeager
AMEC M. Callahan	ALSS	7287	mcallah
ADCS R. Wood	Power Plants	7205	rwood
ADCS V. Calderon	Power Plants	7218	vcaldero
ADCS G. Jubert	Power Plants	7206	gjubert
GySgt. W. Chambers	Airframes	7292	wchamber
AMCS J. Huerd	Airframes	7217	rhuerd
AMCS R. Stanwood	Airframes	7220	rstanwoo
AMCS D. Dunn	Airframes	7219	ddunn
AZCS J. Meyers	Analytical Data	7269	jmeyers
SSgt. J. Williams	Analytical Data	7290	jwilliam
CWO3 R. Kubik	Avionics B.O.	7278	rkubik
ATCS T. Smith	Avionics	7280	tsmith
AEC R. Tate	Avionics	7275	rtate
CWO4 S. Thomas	S.E.B.O.	7293	sthomas
ASCS E. Guerra	Support Equip.	7291	eguerra

How to Manage the Required Reading Board

by AEC(AW) Robert Tate

Active and standing reading boards are great training tools but only when the supervisors, CPOs and division officers make sure the boards have pertinent information.

You should update the active board every day and list new items on the read-and-initial tracking sheet; the signatures tell you who is reading the boards. Save the completed forms and items you remove from the board in a dead file to document training on a specific item. Move permanent information to the standing board.

Once a month, supervisors can use the bottom row of the read-and-initial form for a sign-off sheet by writing "Work center supervisor review" in the name block on the left-hand side of the form. Starting on the row just above the supervisor's block, list the months in the spaces reserved for initials.

In their review, supervisors should remove items from the active board and place them on the standing board if they have on-going application. Managed this way, repetitive training can be cited on the standing board.

Except for cross-locators, nothing should be on the standing board that has not been on the active board first.

The standing board reviews important information, so the read-and-initial sheet is a monthly tally of who has read its contents.

Put cross-locators only on the standing board. The cross-locator listing enables supervisors to monitor monthly reviews of important directives and instructions without having to hang the entire item on the read board. The best part is that the individual doing the review must initial that they have reviewed and understood these items, too.

Many read and initial sheets that survey teams see around the fleet could be trashed if this part of the standing board was managed right. Once again, as with the active board, the completed read-and-initial sheets and all items removed from the standing board should be kept in a dead file for the tenure of the supervisor to prove repetitive training.

Do you use a separate safety board? Unless an instruction or directive mandates one, what's on that board that couldn't be on the active or standing boards? Safety-meeting minutes can be placed on the active and standing boards and partitioned off to make them easy to locate.

If you are directed to have a safety board, manage it as a standing board. You will still have monthly reviews, but they may ease the administrative workload on the supervisor.

Teach new people about the active, standing (and safety) boards; all personnel who check into a work center must read and review these boards. If this practice becomes standard, everyone in the work center will be on an even keel and aware of anything that could complicate their job in the squadron. If we correctly prepare and manage reading boards, we can turn this sometimes-neglected tool into a valuable training resource.

SUPERVISION

Who Will Need Remedial Training for Lessons Learned?

by AMCS(AW) Rory Stanwood

Reviewing messages, I came across some disturbing mishaps. They should have been avoided because they've happened before. Supervisors are supposed to review lessons learned from reported mishaps and hold training to prevent their troops from making the same mistakes. The following mishaps are not originals – I've seen them all before.

In one mishap, a nose-landing gear collapsed on a troubleshooter who had ignored a warning in the MIMs. After a drop check, he didn't remove the tape from the MLG weight-on-ground (WOG) proximity switch. A QAR also failed to notice the tape during his inspection.

After the takeoff on the PMCF, the pilot had to override the downlock to raise the landing gear which also caused AFCS problems related to a bypassed WOG switch. The troubleshooting began as soon as the aircraft returned to the flight line.

Troubleshooter No. 1 inspected the wheelwell for damage. Troubleshooter No. 2 entered the cockpit and asked the aircrew to raise the landing-gear handle. He assured the pilot the gear would not retract. He dismissed the pilot's concern about this action and convinced him to depress the landing-gear-override button and raise the landing-gear handle. With the gear handle raised, the engine turning, and the nose-landing gear unpinned, and the WOG taped, the gear collapsed and killed troubleshooter No. 1 in the nose wheelwell.

This mishap sequence had numerous warning flags that everyone ignored. If **anyone** has a doubt about the correctness or safety of a procedure, **stop**.

In a second mishap, a maintenance technician checked the wing-fold handle to ensure it was in the "fold" position before he started a hydraulic jenny, but he didn't have another technician in the cockpit as required. When the jenny started, the aircraft's wings spread into an adjacent aircraft damaging both birds. The troubleshooter had been working on an unrelated hydraulic discrepancy.

Investigation revealed the wing-fold handle's actuator cable had been adjusted wrong following a slat-gearbox change. This allowed the wings to spread with the handle in the fold position. A maintenance technician adjusted tension on the wing-fold cable and then held training on emergency procedures for uncommanded wingspread.

Finally, upon application of 75-psi air from a huffer, the huffer's airhose violently blew off the coupling on the pneumatic-duct assembly. A troubleshooter preparing to bleed the hydraulic system from the port reservoir just aft of the huffer-hose's attachment point bruised his right cheek when he was struck in the cranial and face and knocked to the ground. The strapping seals securing the hose to the coupling had been installed wrong and allowed the hose to come off when air pressure was applied.

Use these mishaps as lessons learned in training your troops. Unfortunately, someone will probably not get the training. Will it be someone for whom you are responsible?

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

Time Out!

by ADCS(AW) George Jubert

It had been a long, cold night for the Sailors on night shift. The wind sliced across the barren flight line and looked for openings in Sailors' foul weather gear. An hour before sunrise, there was just one more aircraft to move before we secured. During this move, a young Sailor, the starboard wing-walker, became disoriented, fell in front of the moving tire of the towed aircraft, and was crushed to death. Earlier in the shift, the Sailor had been counseled for making mistakes while wing walking. A sad point in this mishap was that he was found with his safety whistle inside the pocket of his foul-weather jacket.

This is just one of the obvious mishaps discussed during our aviation maintenance malpractice presentation. After reviewing the details of the mishap, I could not help but wonder if the situation would have turned out differently if the crew had taken a timeout and applied the five-step ORM process before the move.

Sports fans are accustomed to seeing coaches call a timeout at a critical moment in a game. The coach gathers the players to talk over their options and plan their strategy. He makes sure all team members understand their roles and responsibilities no matter how many times they have been in similar situations. Your timeout just needs to last long enough to go over the plan of attack and discuss potential hazards (ORM).

Heavy workloads with an undermanned staff make the stress level skyrocket. The sense of urgency that maintenance must be done immediately to meet a flight schedule adds to the problem.

The next time you supervise anything from an aircraft move to an engine turn, call a time out. Make sure all your people are qualified, have the correct equipment, understand their responsibilities, and are ready – both mentally and physically – to do the job. This may take a few extra minutes, but it will be time well spent if it helps to avoid a mishap.

ADCS(AW) Jubert is a maintenance analyst at the Naval Safety Center.

Do You Live in the "Fly Zone"?

by ASCS(AW) Edwin Guerra

As a member of the Naval Safety Center's survey team, I usually check tool-control programs. The number of tools I find that are not in either a work-center's inventory or a tool room's master inventory amazes me. These findings have convinced me I'm seeing a dangerous lack of concern.

I keep finding wrenches, sockets, pliers and other tools in desk drawers, personal lockers, and in unsecured storage areas.

I have found some supervisors who don't want to upset their buddies or create friction by violating the personal privacy of desks and lockers. This attitude shows a disregard for the lives of aircrew and the families living under the airspace our aircraft use.

What if an aircraft crashes because someone didn't care about the consequences of a missing tool? Look everywhere, including lockers and desks. Don't be shocked by your accidental findings. Take control of your extra tools.

PH2 Matthew J. Thomas

Are You Part of the Solution or the Problem?

by Joe Casto

A veteran troubleshooter pitches in to help a young plane captain start an aircraft. After attaching a huffer hose to a bird, the troubleshooter stands by to disconnect it once the engine is on line. He doesn't know the hose isn't correctly attached to the huffer. When high-pressure air enters the hose, the huffer-end comes loose and smacks the troubleshooter where it really hurts.

You can't do zip in naval aviation without support equipment (SE). SE allows you to start, move, and work on aircraft with relative ease. You take it for granted because you're so used to SE being there for you that you don't pay much attention to it until it stops working right. Then you blame the ASs (aviation support equipment repair). "They don't fix our SE to last" is the usual complaint.

If you ask an AS to define the problem, he'll tell you squadron personnel don't pre-op SE thoroughly or often enough. They're too rough on it, and they use it when they shouldn't–when the brakes are weak, for instance. Anyone who has worked in the hangar or on the flight line for 30 days knows what a pre-op is. For the underexposed, it's a preflight for equipment that doesn't fly.

Why can't we get good fixes on yellow gear? Let me answer this question with a few questions: Do you pile toolboxes, tie-down chains and chocks on tractors and huffers or use them as workbenches? Do you stand on them instead of going after a ladder or B-4 checkstand? Do you use SE as a taxi on the line and in the hangar? Do you pre-op or preflight SE before you use it? Do you report problems (such as weak brakes) as you find them or wait until the equipment is a basket case?

The ASs who work on SE see squadron maintenance people abuse SE every day. They take it personally when 10 different drivers are rough on that equipment 16 hours a day, running it while it's low on fluids, and ignoring minor problems until they become big ones. Would you take pride in repairing that SE or just do enough for it pass minimum standards?

AN Michael Sadler, VAQ-137

ASs are in short supply, so it isn't uncommon for them to initial a couple hundred checks every day. That estimate includes CDI, tool control and paperwork. You have to wonder how thorough their work is. At least they don't have to maintain a squadron's IMRL gear. Squadrons are responsible for their own IMRL gear, but the equipment is usually stored in the SE compound. That can be confusing when you're up to your ears in day-to-day ops. For instance:

Mechs transferring an engine from a stand to an engine sling were turning a handwheel to raise the engine. The engine had just lifted off the mounts when the handwheel stripped from the threaded shaft of the up-loading adapter. The engine dropped about 3 inches, and No. 3 prop blade struck the engine stand's rails. Investigation revealed severely corroded and worn threads on the handwheel. There are no inspection schedules for yokes. So how do we avoid a repeat by someone else?

The mishap CO says we can't afford SE failures with props and engines becoming scarce. He contends that lifting and moving engines is tough enough without having to worry about the integrity of support equipment. He has a point, and his suggestions are easy to follow. Determine which equipment of your pre-positioned SE and IMRL you're responsible for maintaining. Set up inspection schedules and train your people to work on the gear. If you have equipment that has no inspection schedule, set up a local requirement for testing and corrosion control. Be certain your operators pre-op SE every time they use it. Turn in SE to the pool whenever you find something wrong; don't let problem skirmishes with equipment lead to a war with the SE pool.

Supervisors in the AS rating are not required to educate operators how to treat SE. ASs are not supposed to police how the equipment is used; that's the responsibility of the operators' supervisors. So, supervisors, if your operators ignore your teachings, nail 'em. You can bet the ASs and COs want you on their team.

Flight, Flight-Related and Ground Mishaps

Class A Mishaps

Aircraft	Date	Command	Fatalities
EA-6B	11/08/98	VAQ-130	4
S-3B		VS-22	0
FA-18C		VMFA-312	0
FA-18C		VFA-37	0
FA-18C		VFA-37	0

A Prowler's starboard wing hit the vertical stabilizer of a Viking on the angle deck during a waveoff. Burning fuel and debris damaged three Hornets. The Prowler's crew did not survive; the Viking crew successfully ejected.

CH-46D 11/19/98 HC-8 2
An engine failed during VERTREP and the Sea Knight ditched.

AV-8B 12/03/98 HMM-163 0
A Harrier had an in-flight fire and crashed at sea.

T-2C 01/06/99 VT-9 0
The aircrew ejected after the nosecone departed the aircraft.

AV-8B 01/07/99 VMA-311 0
A Harrier crashed from a 50-foot hover; pilot ejected.

CH-53E (six) 01/18/99 HMH-772 0
AH-1W (three) MAG-49 0
CH-46E HMX-1 0
Ten helos were damaged by severe weather.

FA-18C (two) 01/20/99 VMFA-212 0
A pair of Hornets collided while flying in formation over water.

AW-1H 02/10/99 HMM-365 0
A Super Cobra crashed in the Pamlico Sound during a night ordnance training flight.

FA-18C 03/10/99 VMFA-212 1
A Hornet disappeared from a radar screen during a night NVG CAS mission.

SH-60B 03/23/99 HSL-43 0
A Sea Hawk crashed into the water during a functional check flight.

Class B Mishaps

SH-60F 01/12/99 HS-7
A sonar dome departed when a Sea Hawk attempted to recover from an unstable hover.

FA-18C 01/29/99 VMFA-251
Both engines and the belly were damaged when a Hornet flew into a flock of birds.

FA-18C 02/08/99 VFA-137
A Hornet was struck after it released a missile during an air-to-air missile-fire exercise.

SH-60F 02/17/99 HS-15
A sonar transducer departed its cable during a sonar recovery.

EA-6B 02/22/99 VAQ-140
The nose radome departed a Prowler during an approach to the initial for an overhead break and FODed both engines.

F-14A 02/25/99 VF-41
Both MLG collapsed when a Tomcat trapped during a case I recovery.

S-3B 03/10/99 VS-22
A Viking's port mainmount collapsed on touchdown.

CH-46E 03/12/99 HMM-164
Smoke and flames erupted from the Sea Knight's generator and aft transmission area before transition to forward flight.

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Printed as a supplement to *Mech* by
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