2017, Vol. 61 No. 4

Approach

The Navy and Marine Corps Aviation and Aviation Maintenance Safety Magazine

CRM Power

How Teamwork Leads to Mishap Free Flights

A Look Back:

See How Approach and Mech Have Shaped Safety Culture Over the Years

We're Going Digital!

Details on Page 2

Approach- MECH

The Navy & Marine Corps Aviation and Maintenance Safety Magazine

2016 Volume 61, No. 3

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

Approach-MECH Staff

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

Aviation Safety Programs Directorate

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

All Analyst

safe-code11@navy.mil Ext. 7811

Postmaster: Send address changes to *Approach*-MECH, Code 70C,
Naval Safety Center, 375 A Street
Norfolk, VA 23511-4399
Send article submissions, distribution requests, comments or questions to the address above or email to: SAFE-Approach@navy.mil and SAFE-Mech@navy.mil

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

www.facebook.com/NavalSafetyCenter

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

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

NAVSAFECEN Anymouse Submissions. Have a safety problem that isn't getting solved? Submit an Anymouse form anonymously. Go to our website for details. https://www.public.portal.navy.mil/navsafecen/Documents/staff/ANYMOUSE_submission.pdf

Approach

On the cover:
Marines fly a V-22 Osprey during a cross country flight to Ashville. Photo by LCpl Todd DeSantis (VMMT-204)

CORRECTION:
The cover photo (below) that appeared on the cover of Approach-Mech 2016, Vol. 61 No. 3 was taken by Jose Ramos. The magazine included a misprint that said he was also a pilot. Jose Ramos is not a pilot but he did note that the unit he frequently shoots and flies with gave him an honorary set of wings. You can see his work at www.ramosaviationphotos.com.

WRITERS WANTED

Interested in writing for Approach-MECH? Please use the following guidelines when submitting articles. If you have an article you'd like to see in Approach-Mech please e-mail it to one of the email addresses below:
Approach: SAFE-Approach@navy.mil
Mech: SAFE-Mech@navy.mil

Our surveys consistently show that readers like articles written by their peers, and they like to read about true-life events and experiences. Your effort keeps others from having to learn the hard way. Therefore we want your letters, feedback, and comments.

CONTENTS

In 1955, when the first issue of Approach was published, VADM Thomas S. Combs said in his foreword, "To realize maximum effectiveness and combat readiness it has been necessary to place strong emphasis on our aviation accident prevention program." Those words have never been truer and the magazines have lived up to those expectations.

Navy and Marine Corps aviation safety has had its fair share of ups and downs in regards to mishaps as Sailors and Marines have focused on mishap-free flights. The mishap rates have gone down over time and processes have improved. As a result, more units are reaching mishap-free milestones with ease.

The purpose of Approach and Mech has always been to highlight those milestones as well as making the aviation community aware of accident-prevention methods through stories told by people who have actually experienced mishaps. However, change comes and we begin doing things differently to keep up with those changing times. In the publishing community, we've seen many newspapers and magazines move toward online formats intended to reach larger audiences.

Starting in mid-march, Approach and Mech magazines will follow suit with other magazines and be published online only. The magazines will be under the umbrella of a new digital magazine titled 360°SAFE. While this is a bittersweet change, because it will likely be my last physical publication, I embrace it since I have seen other publications successfully make the transition. I have worked on eight publications that have all eventually made their way to the internet As an editor, my first concern is always about what's best for the community the publication is intended to reach.

Those of us at the Approach and Mech staff understand that and we are constantly brainstorming ways to make this transition work for everyone. We know that there are units that have limited access to the internet. Therefore, we are happy to send out digital copies to those who request it. While I cannot predict the future, I do know that Approach and Mech online will continue to provide the same mishap-prevention focused content that the printed editions did. We will continue to accept articles, Bravo Zulus and mishap-free milestone and stats about your unit's progress.

The move to an all-digital publication also opens the doors for new processes and gives us more space to work with. In the past, I could only published eight to 10 articles. Now we can share more information and it will be more up to date. The content will also be shared on our social media platforms.

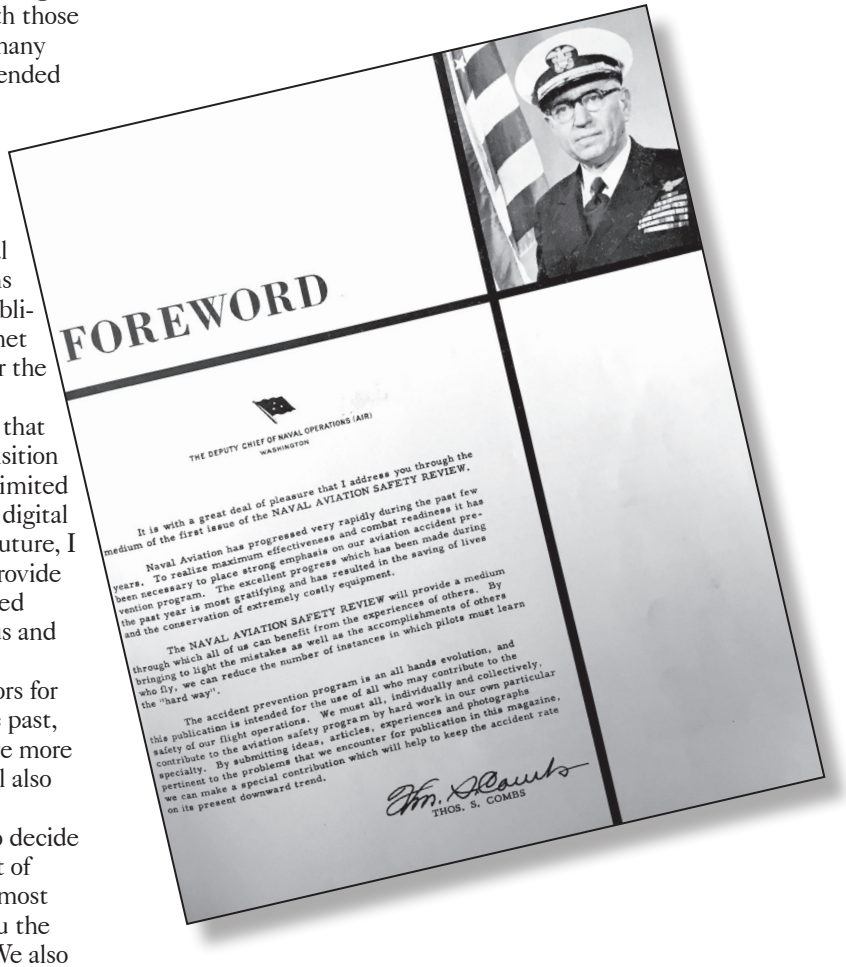
In regards to this final printed issue, it was very tough to decide which articles would make the cut. As usual we receive a lot of good content but I went with what I thought would be the most impactful. I also decided to visit the past and share with you the history of our aviation and maintenance safety magazines. We also decided to revisit some of the former staff members to update you on what they're doing today.

Just as I was wrapping up on the magazine, I received an impassioned phone call from LT Neil Tublin, the author of "A Simple Solution Missed," on page 16. He felt writing the article was the last thing he needed to do to a put painful situation behind him. Neil will never fly for the Navy again. He didn't follow procedures and it led to the total loss of his aircraft. While I could hear the disappointment in his voice I could also tell it meant a lot to him that no one else repeats his mistake. His article and those like it, is exactly why the magazine began. It took a lot of guts to admit his mistake and for him to look back and trace the steps to discover where he went wrong. It is my hope that his story has an impact on you that will make you think before skipping or missing a step.

If you'd like to be added to our distribution for updates on the new online magazine, fill out the subscription request form on the inside back cover. Please mail it that back to us or email your request to SAFE-Approach@navy.mil or SAFE-Mech@navy.mil.

Nika Glover

Editor, Approach and Mech
Naval Safety Center



FOREWORD

THE DEPUTY CHIEF OF NAVAL OPERATIONS (AIR)
WASHINGTON

It is with a great deal of pleasure that I address you through the medium of the first issue of the NAVAL AVIATION SAFETY REVIEW.

Naval Aviation has progressed very rapidly during the past few years. To realize maximum effectiveness and combat readiness it has been necessary to place strong emphasis on our aviation accident prevention program. The excellent progress which has been made during the past year is most gratifying and has resulted in the saving of lives and the conservation of extremely costly equipment.

The NAVAL AVIATION SAFETY REVIEW will provide a medium through which all of us can benefit from the experiences of others. By bringing to light the mistakes as well as the accomplishments of others who fly, we can reduce the number of instances in which pilots must learn the "hard way".

The accident prevention program is an all hands evolution, and this publication is intended for the use of all who may contribute to the safety of our flight operations. We must all, individually and collectively, contribute to the aviation safety program by hard work in our own particular specialty. By submitting ideas, articles, experiences and photographs pertinent to the problems that we encounter for publication in this magazine, we can make a special contribution which will help to keep the accident rate on its present downward trend.

THOS. S. COMBS

Approach Bravo Zulu

Sailors and Marines Preventing Mishaps

PO1 (AW) EVERARD FENNELL

During aircraft recovery, PO1(AW) Everard Fennell was standing by to conduct post-flight duties while waiting for engine shutdown, when he noticed a small amount of smoke coming from the APU intake. He walked around the front of the aircraft to investigate and found flames protruding from the APU exhaust door. He detected excessive burning and flames in the APU exhaust manifold. PO1 Fennell gave the flight station the hand signal for "APU Fire," and they safely executed the ground evacuation of 24 aircrew. During this incident, PO1 Fennell's action exemplified excellent flight line situational awareness and prevented a potentially dangerous situation from developing.

PO2 (AW) ERIK ANTRIM

While performing a 91-day inspection at NAS Whidbey Island, PO2 (AW) Erik Antrim, in the performance of his duties as W/C 120 CDI, noticed two ailerons trim tab cable keepers were not installed on A/C 160764. Knowing the cable keepers were supposed to be installed, he brought it to maintenance control's attention. After writing up a maintenance action form, both cable keepers were properly installed.

As a result of his exceptional attention to detail, a potential inflight hazard that could have significantly affected safety of flight was averted. His demonstration of exceptional diligence and knowledge sets a shining example for others to follow. PO2 (AW) Antrim's steadfast awareness and overall vigilance broke a chain of events that may have led to a potential mishap and ensured continued safe squadron operations without injury.

LTJG JONATHAN SMITH

LTJG Jonathan D. Smith, a flight student with Helicopter Training Squadron EIGHTEEN at NAS Whiting Field, Fla., demonstrated exceptional situational awareness and initiative while acting as the assistant operations duty officer at Navy Outlying Field Pace. While monitoring six aircraft, LTJG Smith noted TH-57B aircraft 174's main rotor system was making a loud tapping sound as it transitioned to forward flight. He immediately notified the aircrew and they subsequently landed to investigate. After shutdown, the aircrew noticed the main rotor tip was seriously damaged because the blade weight had become dislodged. His quick thinking and assertiveness averted a potentially deadly mishap.

BY LT SAM CROUSE, VFA-211

A WEEK LONG VACATION

Aviation Ordnanceman 3rd Class William Miller, assigned to the Gunslingers of Strike Fighter Squadron One Zero Five (VFA-105), arms an AGM-65 Maverick laser-guided missile loaded on an F/A-18 Hornet . (Photo by Photographers Mate Airman Kristopher Wilson)

My pilot and I were headed into country on an Operation Inherent Resolve mission. We were tasked with close air support in Northern Iraq. We were excited for the possibility of a busy flight with all junior officer crew. Our brief and preflight were standard, and nothing abnormal was noted with the aircraft. Right before we went up the ladder a maintainer told us that we would be starting on ground power because the battery was weak. When we got in the jet the pilot noted the battery voltage was fine, however, we continued with the maintenance recommendation to use ground power. The jet required multiple attempts to hold ground power. However, once it held the start was uneventful and we had the appropriate 28 volts on the battery gauge.

Though the battery gauge can show critical information regarding the status of PMGs and battery chargers, it is only available in the front cockpit and was not a part of my pilot's normal scan. The battery gauge shows either the maintenance or essential bus, and in either case we expect to see 28 volts in flight. Even with the weak battery, we were not concerned with it or the electrical system. We pressed on with no indications of electrical troubles.

Our transit into Iraq was normal. As we had hoped, the flight was busy. Checking in with the JTAC we were immediately tasked to scan a few towns and told of possible vehicle-based IEDs that we may be called upon to strike. As we neared our first aerial refuel time we received the clearance for our first attack. We successfully employed an AGM-65E Laser Maverick into the first of the two VBIEDs and headed to the tanker.

Upon checking back in with the JTAC after refueling, our wingman cleared us to attack the second target with an additional Laser Maverick. We collected bomb damage assessment for the second attack and were expanding our search for activity in the surrounding area when we received the audio indications of the MASTER CAUTION. A quick scan of our display showed we had several cautions. The first cautions were AOA TONE and G-LIM 7.5G. This set of cautions is most commonly associated with hung ordnance, or store management issues since the jet is unable to appropriately schedule the G and AOA limit based on the weight of the aircraft. We scanned the stores display and it showed no issues with the ordnance, just the missing LMAV we employed earlier. A look at the checklist page showed a flashing aircraft weight, indicating the jet did not know its weight. With this information I told the pilot it was likely a fuel issue.

Before we could begin to troubleshoot further, another set of cautions came up. This time we received more cautions: FCS, NO RATS, RDR OVHT, and CAUT DEGD. I began calling them out, and the pilot reported that we had zero volts on the battery gauge. Since we had both generators online this indicated a maintenance bus voltage of zero. It was at this time that we put our nearest divert, Erbil, Iraq, on the nose. The pilot told our wingman that we were seeing several odd cautions and briefly described them. We expressed our concern that this may be an actual failure and our intention was to divert. Our wingman responded that they would follow us in and that they would handle all communications. Having all our comms handled by our wing enabled us to turn our radios down and talk inside the cockpit.

The pilot said he was shutting off the radar in response to the RDR OVHT caution while I broke out the book for the CAUT DEGD. Our PCL steps consist mostly of notes pertaining to what a CAUT DEGD really means for aircrew – that the jet may or may not be able to display new cautions, or remove cautions when they are no longer applicable. There are only three steps for a CAUT DEGD. We executed step one by resetting the signal data computer (SDC) and, as we did, we noticed

the FUEL page only had an estimated fuel level indicated by a flashing value. When this reset failed to fix the issue we cycled mission computer 1 (MC1) power. When we did so, we lost our engine fuel displays (EFD). The cycling of power also failed to fix the CAUT DEGD, so we moved to step three: land as soon as practical.

It was about this time that our wingman came up on the AUX radio and told us he had informed the necessary agencies that we were diverting and what approach frequency we were talking to. I switched to that frequency and heard them ask if we were an emergency aircraft, to which our wingman replied "yes". I switched our squawk to 7700 and returned to troubleshooting with the pilot. We still had plenty of time to go and were pointed directly to the field. I trusted our wingman would contact us if we needed vectors for the approach.

The wording "land as soon as practical" gave us pause and we briefly had a discussion in the cockpit regarding the possibility of heading back to the ship. Hundreds of miles of flight over territory that is - at best - contested by ISIS, quickly validated our decision. Investigating our other cautions and cockpit indications only validated our decision further.

We began going through the steps for the RDR OVHT caution. The RDR OVHT caution listed a note that the caution would extinguish when the radar was turned off, even if the overheat condition persisted. This note normally would be included to prevent aircrew from turning the radar back on simply because the caution went away. However, for us it confirmed that our CAUT DEGD was real, because we still had a RDR OVHT caution after turning off the radar. We also looked at the flight control system page to determine the cause of our FCS caution and noted that we again had a G-LIM 7.5G, reiterated on the FCS page. We determined that we had no accurate indications of fuel level displayed in the cockpit. With no working EFDs and a CAUT DEGD we were concerned with our ability to recognize any further problems. We noted an FPAS advisory and no information on our flight performance advisory system (FPAS) page, reinforcing that we really did not know how much fuel we had, how far we could go, and if we could even refuel. We discussed that an SDC failure might affect fuel transfer and make airborne refueling impossible.

With our decision to divert confirmed, we now began to focus on our approach into Erbil. We needed to start descending to make an approach. As we did, I got out the approach plate and swung the course line through the waypoint on runway heading. The pilot offset to the South and began to set up for a straight in to runway 36. As we began our descent, the approach controller told us we would be losing contact with him and to switch tower. I requested the tower frequency and switched up. After that we set ourselves up for a very steep but otherwise uneventful approach. Our wingman took a split from us and got separate landing clearance. We quickly executed HAIL-R and landing checks ensuring we were ready for a shore-based landing. Prior to landing I had plenty of time to determine three things from the approach plate: there was no ground frequency, we had plenty of runway length, and that the copy I had was too faded to determine any taxiway layout.

As we rolled out, tower told us to exit the runway at taxiway A2. The pilot responded by telling tower that we required a significant ground roll. He was worried that we could blow our carrier pressurized tires, so elected to use aero braking for as long as possible. As we slowed below 50 knots with plenty of runway remaining, tower advised us that we had missed our assigned taxiway. We told tower that we were unfamiliar with the field and would take longer to come to a stop. Tower then directed us to back taxi and exit on A2. As we back taxied I turned up my map light in another futile attempt to read the taxiway diagram and told tower that we would require progressive taxi or a follow-me truck. They responded that a follow-me truck was on its way. Our taxi was uneventful and an air force crew was waiting to guide us into our parking spot at the transient line. Our wingman, met us a short time later.

At the flight line, after my pilot hand cranked the canopy open, we were met by former F-18 guys who helped us call back to the boat. Our maintenance department gave us initial troubleshooting steps and found a battery charger circuit breaker popped and reset it. We told maintenance that ground power failed to power the canopy, any of the maintenance panels or the interior lighting, and we saw no charge on the battery. A rescue detachment was then organized with the parts for a battery charger failure.

Our wingman left the next morning and returned to the boat. It would take six days before we left. While we were in Erbil we had abundant time to study all the gear in our survival vests, try to piece together what happened with our jet, drink from our souvenir Kurdistan mugs and take turns with a crossword puzzle book. We also had the rare opportunity to see some of the operations there and meet some Kurdish fighters who were incredibly thankful for what the U.S. is doing in the area.

Maintenance replaced the battery and battery charger the same night they arrived. The job only took a few hours; most of it spent dropping the gun out of the way. The maintainers told us the battery charger was surrounded by charring where it had apparently shorted out. With the new parts installed, our start-up was uneventful and the flight back was completed without incident.

> "Looking back on the flight, I am certain we did the right thing diverting into Erbil."

Safe on deck on the ship, we were able to start analyzing what had happened, and how our failures were related. All of our failures were related to the battery charger. The battery was likely weak on deck due to either being undercharged by the charger, or possibly due to an intermittent short in the battery charger. When the battery charger shorted out in flight, it meant that the maintenance bus became unpowered, and with it the SDC. With no SDC the jet was unable to calculate its fuel load and could not determine its weight accurately. In this case the jet was able to display estimated total fuel only, and left all individual tanks indications at their pre-failure value. In addition, our FPAS could not tell us our range or endurance due to the lack of fuel information. Interestingly, the estimated fuel value provided by the jet (using pre-failure values and fuel burn over time) at touchdown was only a couple hundred pounds off from the level that the jet reported after it was repaired.

In addition the lack of power to the SDC caused us to have a CAUT DEGD, and to lose EFDs and the ability to read MSPs. This DEGD had the serious implication that any future cautions or advisories may or may not be presented to aircrew and

Aviation Ordnancemen download a AGM-65 Maverick laser-guided missile from a weapons pylon of an F/A-18C Hornet, assigned to the Gunslingers of Strike Fighter Squadron One Zero Five (VFA-105), on the flight deck of USS Harry S. Truman (CVN 75). (Photo by Photographer's Mate Airman Gregory A. Pierot)

we were seriously limited in our ability to tell if the jet's status was degrading further.

With the SDC unpowered, we lost some fuel transfer logic including the ability to fill or transfer from our centerline external tank. The RDR OVHT caution seems to have been unrelated but it served a good purpose in getting us to take the CAUT DEGD seriously.

In addition to all the failures we knew about we also lost some redundancy for other systems. The flight control computer (FCC) and inertial navigation system (INS) "keep-alive circuitry" are powered by the maintenance bus. If we were to lose primary power to either, we would lose some functionality for a short time until back-up power sources kicked in.

Looking back on the flight, I am certain we did the right thing diverting into Erbil. The inaccuracy of displayed information, coupled with our correct assessment that fuel transfer would be affected by the SDC failure led us to divert. Though we never related our problems back to a battery charger failure in-flight, we were able to come to a remarkably close understanding of what had failed on our jet and why. Task shedding communication responsibilities to our wingman was instrumental in enabling the effective conversation we had in the jet. Had we decided not to divert we may have found ourselves over Iraq unaware of further compounding failures and unable to receive fuel in order to get home.

While our crew resource management (CRM) was excellent for the most part, it broke down in a few areas. While the conversation about our failures led to an accurate understanding and sound decision making, it put us behind timeline coming into the airport to land. With both of us busy troubleshooting the jet, we simply waited too long to start focusing on landing. We both recognized the issue and were very thorough in ensuring the jet was configured appropriately. The pilot did ship-to-shore checks and landing checks aloud, which I echoed challenge and response. After this we had a "what are we missing?" conversation where we discussed the runway length, desire to avoid braking hard on carrier pressurized tires, and that we did not expect any control issues. While this quick but thorough ORM process mitigated any problems, we should have devoted some of our discussion to landing as soon as we solidified our decision to divert.

The second breakdown in CRM was a minor one. When we missed the taxiway and accepted back taxi instructions, we allowed tower to cancel our wingman's landing clearance. Our wingman had taken an appropriate split to land after us and now had to do a 360 overhead, potentially putting them in a dangerous spot, low and slow over Iraq. Once we were on deck we started to taxi behind the follow-me truck while our wingman was rolling out on the runway, effectively leaving them to wait for the follow-me truck to come back after taxiing us to the transient line. These were minor things, and it could be argued that as the emergency aircraft we should just do our part to get the jet on deck. However, once we were on deck and felt safe, we easily could have requested to roll out to the end of the runway to wait for our wingman and taxi as a section.

The major takeaways from the flight were that we had a limited understanding of this part of the electrical system, specifically battery charger failure, prior to the flight. Battery charger failure is not a common failure and does not have its own emergency procedure. The only way to figure out the systems lost with a battery charger failure is by using a pull out appendix page of the big book NATOPS for what each electrical bus powers. This information is not found anywhere in the pocket check list. Additionally, prior to this flight my pilot did not check the battery voltage gauge as part of a normal scan, expecting to only need the gauge prior to and after start, or during a dual generator failure. Without checking the voltage gauge throughout the flight we do not know if our battery charger failed suddenly or if it gradually failed with a slowly decreasing voltage. A gradual decline in voltage may have clued us into the failure and allowed us to troubleshoot and divert before we lost crucial systems.

Overall I would call the flight a success. A wingman who was spring loaded to offer assistance without hopping into our cockpit unnecessarily, and a detailed conversation in-cockpit, turned a bad situation into a chance to see the world a little. We effectively employed two Laser Mavericks on vehicle borne IEDs, handled a compound emergency to a good conclusion, and spent six days seeing a side of Operation Inherent Resolve we otherwise would not have been able to see.

BY LT GREG MAYERS, VFA-113

Less Than Optimal Conditions

At the end of the first week of Composite Training Unit Exercise (COMPTUEX) I was launched on the first event of the day: a "good deal" BFM hop with a Super Hornet from another squadron. As a nugget and non-section lead, I was very excited at the opportunity to fight a strike fighter tactics instructor (SFTI) and have some fun at the same time.

The weather that day was perfect. The launch, tanking, and rendezvous all occurred uneventfully. After the third fight we discussed having enough fuel for one more quick set. As we were setting up our positioning for the last set, I heard "Betty's" voice and saw two red lights appear in front of me. "Bleed air left, bleed air right." Very quickly thereafter, the lights extinguished and two BLD OFF cautions displayed indicating the jet detected the leak and attempted to stop it automatically by commanding the bleed air valves closed. Since the red lights went away, it seemed the system worked. I immediately went through NATOPS boldface procedures. I was now breathing emergency oxygen and was luckily already below 10,000 feet MSL prior to the warnings.

I went through the procedures methodically, remembering "no fast hands in the cockpit." At this point with aviate and navigate being solved, I communicated the problem and my fuel state to my flight lead. He was very calm and collected, and started directing the flight through the logical steps to get me safely aboard. Meanwhile, I executed the rest of the procedures in the NATOPS pocket checklist. I also decided to stow my emergency oxygen and save it for the final approach. We discussed our gameplan on our tactical frequency. He would enter the low holding pattern for recovery while I would stand by outside of the boat's airspace. We would leave it over to the Air Boss to decide when he wanted me to recover, and my lead would monitor the rep frequency the whole time. It was about 20 minutes until the next launch, and my flight lead had us switch up to strike, relaying that we would need a representative from my squadron on the radio for an emergency. He then switched us to marshall where he mentioned that I was having a problem and would need priority handling. We were then directed to switch to tower.

At this point I was holding 15 miles behind the ship at about 6,000 feet. With the ECS switch in OFF/RAM, the slow speed of max endurance was insufficient to keep the cockpit temperature down, however, at this altitude and airspeed, it was still tolerable. I switched to tower where the Air Boss was aware I had a problem and the rep was standing by. I let the rep know where I was, what my fuel state was, all the cautions that were displayed at the time, and all the procedures that had been done. He backed me up with the NATOPS pocket checklist and confirmed we had not missed any steps.

Dual bleed air cautions often result in a pull forward aboard ship. However, because the bleed air leak detection system appeared to have worked properly with the warning lights going out, no secondary indications, and the presence of an MSP 831, the decision was made for me to recover at the scheduled time. In addition, with the next event already getting ready to launch, it would have taken just as much time to pull forward as it would have to recover at the normal time. The plan was made to have me recover first, ahead of the COD, on a straight in. I was told to expect to shut down in the landing area and get towed to parking after the arrestment.

When bleed air is turned off several systems are lost. While some are intuitive such as air conditioning and pressurization, subtle ones such as throttle-boost did not occur to me. The rep made a good recommendation for me to play with the throttles to get a feel for non-boosted power changes. As the launch got closer to completion, the Boss told me to hold around eight nautical miles behind the ship at 3,500 feet. Once told to charlie I put my mask back on and resumed emergency oxygen flow.

At five miles with the landing checklist complete, the cockpit temperature rose significantly. I reported three miles to tower and began my final descent. I recovered uneventfully on board the ship, shut down in the landing area and got towed to parking. During the tow, my emergency oxygen ran out and I had to remove my mask. Cumulatively, it felt like I had not worn the mask for more than five to 10 minutes, so with all of the holding the conservation was a necessity. Once chained down, I opened the canopy and was thankful that I was safely on deck and finally cooling down.

There were a lot of good lessons learned during this event. Lots of things were done well, and a few things have been done better. Crew resource management was key. The communication between my jet, lead's jet, the tower, the rep, and the squadron duty officer was crucial to making the right decisions. Being a charlie pilot, I obsessively reported my fuel every time I spoke to somebody new. My lead's assertiveness and leadership was great in ensuring that no time was wasted and the situation was set up for success early on. I could have been more prepared for the tougher throttles and the increasing temperature, and the fact that I was surprised by it means I definitely needed to improve my bleed air systems knowledge. It was a good thing that I was hydrated and that I was near the boat. If this had happened farther away and the temperature kept rising for a longer period of time, there could have been more serious physiological consequences that could have precluded a safe trap. NATOPS says that in OBOGS aircraft, there are 10 to 20 minutes of oxygen in the emergency oxygen bottle. However, a warning says that "under less than optimum conditions, as few as three minutes of emergency oxygen may be available." In my case, I did have more than three minutes of oxygen but certainly not 10.

Overall, I'd say this event was handled very well and exhibited good CRM and solid NATOPS procedures. In naval aviation, we always need to be prepared for if and when things do not go according to plan. When game time comes, it is the knowledge and execution that gets you home safe.

BY LT DESMOND FOURNIER, VT-30

Where's the FOD?

It was a special day. I was excited to be flying my first "2P-2P" flight, which is a flight where neither pilot is a qualified (CTPC) carrier transport plane commander (our community's fancy name for an aircraft commander), but both pilots are designated as a (CT2P) carrier transport second pilot.

These flights can be scheduled for training and serve as a useful platform for gaining experience and hours on two 2Ps at once, enabling them to achieve the 700-hour OPNAV requirement to become a CTPC.

Not only was I about to conduct my first "2P-2P" flight with a buddy from flight school, I was going to have the honor of signing for the plane. I wanted to make sure that everything went right. At the brief, we planned to take off early to ensure that we landed on time, fuel up at the hot pits, and hot switch the plane over to next crew without a hitch. The next crew that was flying a paradrop mission involved having our outgoing commodore do a tandem jump with the Navy Leap Frogs. I didn't want to be the one that "broke the plane."

Everything was tracking smoothly until I went to the paraloft to sign for my gear. "I need one of these, right?" I said to the PRs as I was pre-flighting my CMU-33 vest and I pointed to the holster for my SRU-42 bottle, which was empty- and missing. The PRs began uneasily looking through MAFs and the storage compartments to see if anyone had serviced the bottle without putting it back. One of the PRs asked, "When did you see it last?" I remembered that I had it for the flight last night, but I didn't notice that it was missing until afterward. I had failed to do a proper post-flight!

I thought about where my CMU-33 vest was last. Our CMU-33 vests are not required to be worn on normal flights conducted over land, and we routinely hang them on the cargo cage just outside of the cockpit. "I flew 25 last night and hung my vest on the cage. It probably fell off there," I told the PRs as they communicated to maintenance control that I had gear missing and we needed to conduct a foreign object debris (FOD) search on aircraft 25.

This placed the aircraft in a down status until the FOD was recovered. If not recovered with a FOD search, the chiefs in maintenance control would be unable to release the aircraft "safe for flight;" only the maintenance officer could release the aircraft. This is not exactly how I wanted my first mission as an aircraft commander to go.

The bottle was eventually found in the cargo cage of the aircraft. Once verified as mine, I was then able to sign for my survival gear, sign for the plane, and conduct the mission without further incident. I was lucky in a couple of ways that day.

First, I was lucky that nobody had flown since my last flight. It's not often that any crewmembers from the last flight of the day, landing at 2045, are scheduled to be on the first flight of the day the next morning.

If anyone had gone flying with my SRU-42 bottle in the plane, it would have placed aircraft and crew at risk if it was loose as it could potentially be a missile hazard for a catapult launch or arrested landing. We weren't conducting any carrier operations, but it could get lodged somewhere and possibly damage some aircraft components. Second, I was lucky that the SRU-42 bottle was recovered and it didn't cause any issues for my first "2P-2P" flight, or down the aircraft that the commodore was planning on using, as it was the only up aircraft our squadron had at the time.

It was truly a lucky day and a wake-up call to pay close attention to details. There's no reason that any mission should be jeopardized because a pilot doesn't take a couple of minutes to do a post-flight inspection on his or her gear. This experience shows that it is important to not allow complacency to take hold in any facet of an operation, be vigilant for FOD, and perform thorough pre/post-flight inspections of your equipment so you can always account for it. If you don't, you will cause more headaches, or worse.

LTJG Kevin Carter, left, and LCDR Mark Kekeisen complete pre-flight checklists in the cockpit aboard a C-2A Greyhound. Photo by Photographer's Mate 1st Class Aaron Ansarov.

BY LT JACK DEVER, VP-46

Routine Mission, Non-Routine Environment

The maritime patrol and reconnaissance (MPR) community takes pride in its anti-submarine warfare (ASW) prowess; we train for over a year to become experts in the art of tracking and killing submarines before deploying. The capstone of all of our ASW training is the Torpedo Exercise (TORPEX), often the final hurdle before a combat aircrew is fully ASW qualified.

My crew was stoked to have our TORPEX at the Nanoose Range just 30 minutes North of NAS Whidbey Island, saving us the ordeal of a 10-plus hour round trip flight to the range off the coast of Southern California. The only drawbacks to the Nanoose Range are the size of the airspace, just over 12 miles, and its proximity to very busy air corridors.

The range lies beneath Vancouver's Class B approach corridor and is nested against the shore of Nanaimo, a popular seaplane destination serviced by Victoria, Seattle, and Vancouver Harbor. Another factor that plays into the events leading to this article is that the NOTAMed airspace, CYR-107, is not entirely colocated with the underwater weapons range where our target can operate. The end result requires us to fly Southeast of CYR-107 - outside of our protected airspace and closer to the seaplane corridor between Vancouver and Nanaimo, Canada.

With these known hazards, I was fortunate to have two very experienced crewmen with me in the flight station. My patrol plane commander (PPC) had 1,000 hours of flight time and sitting between us was a salty instructor flight engineer (FE) with more than 4,075 hours in the mighty P-3C Orion. As we approached the TORPEX range, we were talking to Victoria terminal and were given a descent to 4,000 feet until cleared onto the range. Once we were cleared, Victoria Terminal called "VVGK801, radar service is terminated, frequency change approved. Contact this frequency five minutes prior to departing CYR-107." At this point we were on our own.We could no longer rely on ATC for traffic calls and the extreme amount of chatter on the frequency crippled CRM between the flight station and tactical crew. We elected to detune Victoria terminal and focus our attention on the mission at hand. After all, as long as we stayed in CYR-107 we were in protected airspace.

An hour and a half later we were well into our TORPEX at 300 feet and we were knocking it out of the park. Our acoustic

LT Christopher Malherek, assigned to the Golden Eagles of Patrol Squadron (VP) 9, pilots a P-3C Orion maritime patrol aircraft during a routine training flight for the squadron's advanced readiness program. Photo by Mass Communication Specialist 3rd Class Amber Porter

operators and tactical coordinator (TACCO) were on top of their game and we were sure we would be getting a near-perfect score. We were in a shallow left hand turn to set up for our last simulated attack when our FE called "traffic 10 o'clock". I was at the controls, saw the traffic, and continued the turn, tightening it up past 45 degrees AOB in order to ensure safe separation from the seaplane. I estimate the seaplane passed roughly half a mile away and approximately 200 feet above our altitude. At this time the crew recognized our target had maneuvered just outside of the CYR-107 airspace, forcing us to maneuver within close proximity to the Nanaimo – Vancouver seaplane corridor.

Re-alerted to the hazard of light civil traffic, we re-emphasized the need to maintain a good VFR scan for traffic. Generally, a P-3C Sensor 3 (SS3) provides excellent backup as he has an IFF interrogator and controls the APS-137 radar. The IFF interrogator can reliably pick up Mode 3 traffic – but only if they are squawking – and the radar can pick up air traffic if the antenna is inclined level with the horizon. Unfortunately, the seaplanes in the Pacific Northwest do not typically squawk and our SS3 was busy tracking surface traffic intent on sailing through the torpedo range.

Thirty minutes later, we finally dropped our MK-46 REXTORP on the target, completing the TORPEX. Range control immediately directed us to climb to 1,000 feet (as previously briefed) in order to provide adequate separation with the range helicopter, soon to be in bound to retrieve the REXTORP.

I was still at the controls and initiated a climb to 1,000 feet, the PPC began to work the flight management system to coordinate our return home, and the FE was heads down setting the fuel panel for the transit. As I leveled the aircraft off at 1,000 feet, I looked up from my altimeter and immediately saw a seaplane; this time it was filling up the entire windscreen and was at co-altitude. I immediately chopped power and dumped the nose seconds before the seaplane passed directly overhead - merely 200 feet above us. Our SS3 operator confirmed that the seaplane was not squawking Mode 3.

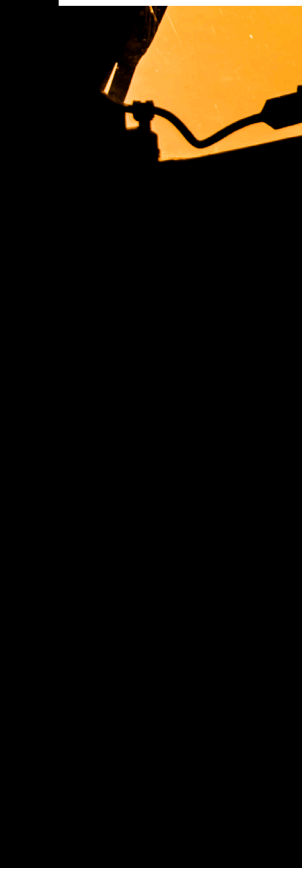
As a community, we are accustomed to operating alone and unafraid hundreds of miles from the nearest airfield or seaplane. We often conduct ASW in open-ocean or within the protected airspace west of San Diego where there is a reduced risk from mid-air collisions. It is easy to become complacent on the rare day you actually get scheduled for Nanoose. Most aircrew in the squadron has gone there just a handful of times, and some never get the opportunity.

Complacency and perceived pressure are the causal factors for this near mid-air. Just because it is a routine mission does not mean it is in a routine environment. On the day in question, the flight station was operating with a due regard mindset, focusing on placing the aircraft in the best position for the TACCO, anticipating where he would want the aircraft to be. The risks specific to the Nanoose Range had slipped to the back of our minds and we were not proactively searching out traffic. With the range helo spinning on deck there was perceived pressure to climb to a safe altitude to allow the helo to retrieve the REXTORP. Once given the command to climb, we should have informed the range to stand-by until the aircraft was back in the protected airspace CYR-107; a missed opportunity for time critical risk management (TCRM). We also placed too much emphasis on technology to keep the aircraft out of harm's way. Tools like an IFF interrogator and TCAS (if so equipped) are excellent; however, they require other traffic to be squawking.

My advice to my fellow aviators is to remain vigilant and maintain situational awareness. TCRM/ORM is not simply a buzz word; proper application could have prevented this near mid-air collision. Just because you are doing a routine mission does not mean you are immune to the hazards of an abnormal environment. At the end of the day, keep your "skulls up". Nothing is better than a good set of eyes to keep you clear of other traffic and get you home safely.

A pilot performs pre-flight checks on an F/A-18C Hornet. Photo by Mass Communication Specialist 3rd Class J. Alexander Delgado

THE POWER OF CRM



I was excited for my SFWT level II Red Air event. After a busy COMPTUEX as a brand new JO, I had returned from POM leave the previous week and passed my NATOPS check with flying colors. My XO (as flight lead) gave a thorough brief and I walked to the jet. During a sweep of the cockpit, I noticed the ECS mode switch in MAN and placed it in AUTO. During start up I adhered to my habit patterns to include watching the CK ECS light illuminate while cycling the bleed air knob.

Passing through 10,000 feet, I glanced down at my cabin pressure gauge and confirmed that it was at 8,000 feet per its normal schedule. After a G-awareness maneuver at 17,000 feet, my flight lead initiated a climb to 30,000 to join another section of red air and set up our first presentation. I was hanging on in TAC wing position while lead maneuvered to get us in position.

At this point, I noticed that the ambient cockpit noise was quieter than normal and a pressure was building up in my ears. I glanced down at my cabin pressure gauge and got the first hint that something was wrong – it was reading 27,000 feet, the same altitude indicated by my altimeter. I also noted the CABIN and CK ECS lights illuminated by my right knee. Seconds after reading the gauge, I inventoried my hypoxia symptoms: tingling and coldness in the fingers, flushing hot feeling chest and lightheadedness. I had been too busy flying formation to notice! I immediately executed the boldface for hypoxia/decompression sickness, pointed at NAS Oceana and started my descent to below 10,000 feet. Thirty seconds after selecting emergency oxygen my symptoms rapidly decreased. I noticed the CABIN light extinguish descending through 12,000 feet, and I was symptom-free within five minutes. With good CRM between myself and flight lead, I landed at home field without further incident. Investigation post flight revealed the culprit: the CABIN PRESS switch was in the DUMP position, making it impossible for the jet to hold cabin pressure.

Even with a nugget pilot like me, preflight is normally briefed as standard. It carries with it the assumption that aircrew execute on deck procedures per NATOPS. Though during my cockpit preflight I noticed one switch out of position, I did not notice a switch that was only two inches away. Additionally, we execute checks at 10,000 feet to verify the pressurization is scheduling normally. Had I looked at the cabin pressure gauge for more than a split-second, I would have noticed it was not holding at 8,000 feet like it should. Lastly, it is important to scan all of our displays throughout the flight. Looking at the warning light cluster by my right knee was not part of my normal habit pattern, as most warnings and cautions are displayed on the DDIs. Had I noticed the glaring CABIN and CK ECS lights sooner, the whole emergency could have been avoided.

The short flight ended with an uneventful landing but it could have been a lot worse. Hypoxia is a hazard we face even when we execute correctly. Going back to something as basic as a proper preflight prevents us from being a hazard to ourselves.

62 Years of Aviation

The first issue of The Approach was published in July 1955. It started out as a Naval Aviation Safety Review and featured safety related stories and anonymous reports that included short lessons learned examples of what not to do.

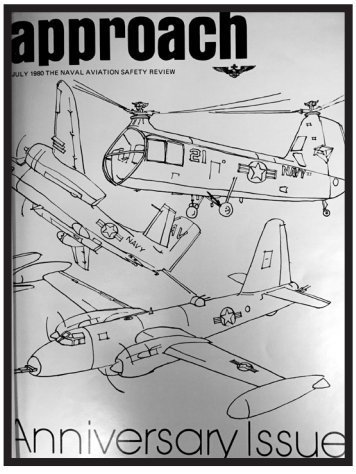
1950s

By July, 1960 The Approach had a name change to just Approach and it had developed a large following over the five years. The staff gave the magazine a new look and it also feature illustrated artwork and letters to the editor.

1960s

What a difference 10 years make. In this case color, was brough to Approach as well as a new look and font for the cover. The magazine became more of a story driven magazine with fewer safety reports and more personal stories from the fleet.

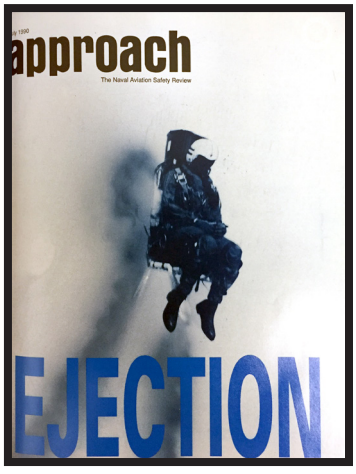
1970s



In July of 1980 Approach celebrated its 25th anniverssary. The staff made a radical departure from the regular monthly offering and devoted the magazine to those who started it. Many artist and editors were featured in the magazine.

1980s

Safety Magazines

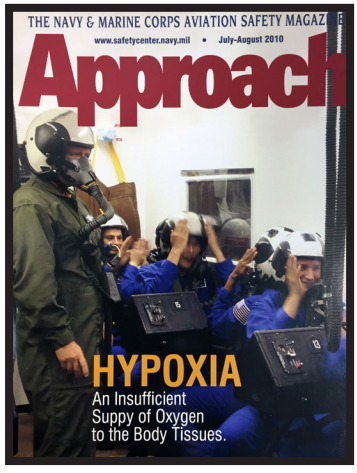


By July, 1990 Approach was featuring Bravo Zulus to highlight people who had prevented mishaps or saved money on repair cost. The magazine was published using a tri-color process and featured some half or fully colored pages.

1990s

At the start of the new millennium Approach was full of digital images and had a Reader's Digest style of content. It also featured the ORM corner which was a bi-monthly section that featured stories about operational risk management.

2000s



In July, 2010 the Approach staff was down to just three people. Jack Stewart, the editor, Allan Amen and John Williams the visual information specialists. The focus of the magazine at the time was on hypoxia and how the psychological threat could be dangerous.

2010s

The first female editor, Nika Glover, came on board in 2015 and gave the magazine a fresh look. Allan Amen and John Williams are still assisting on the visual side and subject matter experts continue to provide useful insight on aviation safety. The magazine will move to an all-digital platform in March of 2017.

Present

BY LT NEIL TUBLIN, VFA-14

A SIMPLE SOLUTION MISSED

I will never fly a plane for the Navy again. I didn't know my NATOPS, how to follow procedures or communicate. It's hard for me to write that sentence. It's hard for me to read it. It's even harder to live with it. This may be an oversimplification of the scenario but I don't think anyone who knows mewould say that it's incorrect.

Everything prior to getting into the jet that day was standard. After man-up, some BLIN codes popped up during my FCS IBIT, causing me to get behind time-wise while troubleshooting the flight control system on my aircraft. As fate would have it the BLIN codes would not clear and I would have to shut down the jet and start up another. I read and signed for the spare aircraft, side 210, at the boarding ladder. As anyone stationed at NAS Lemoore knows, MOA time is precious and stringent. If you miss time on the front end you won't be able to make it up on the back end. My flight lead (who is also my commanding officer) and I only had area A of the NLC MOA for one hour and our entry time was fast approaching. I could feel myself wanting to move faster while pre-flighting the spare, but I fought this temptation and made a conscious effort not to skip anything.

Here is where I mentally take out my pen and paper and begin to count the number of times I could have prevented what would ultimately become a class A mishap. After turning on the battery, I began the standard ditty the FRS teaches, "Parking brake, set. Anti-skid switch, on. Master arm, safe. Wingfold, matches…" After confirming that the wings were spread, I brought my eyes back to the switch and saw that it was in the fold position. I matched the switch position with the wings and continued my ditty. Later in the startup I would also noticed that the ECS MODE switch was in the OFF/RAM position. This is where I should have paused and thought to myself, "What else is wrong in my cockpit?" I had rarely (if ever) seen a switch in the wrong position during start-up, yet now I had two and didn't think anything of it. I should have been suspicious as to what I hadn't found. The INTR WING switch was in INHIBIT.

Things can move pretty quickly in the Lemoore MOA since the airspace is directly overhead the airfield. One moment you're on the ground and the next you're checked in and getting ready to execute your first BFM set. On this flight we did just that, we took off uneventfully and went right into the mission.

Just before my bingo bug went off, with the fuel reading 11.1, I switched my bingo setting to 9.0 as we are taught. I also noted that my external tank

was empty and switched from my external fuel display to the internal fuel display on the Engine Fuel Display (EFD). I even noted that my feed tanks were full. However, I had skipped a crucial step in this procedure. The ditty that is taught at the FRS is, "External tanks empty, WING TANKS TRANSFERRING, feeds nearly full, resetting bingo to 9.0." I did not take note of the state of my wing tanks. At 9.0, I was once again resetting my bingo bug to the briefed joker fuel state of 6.0. At this point I did not execute the proper check, "WING TANKS TRANSFERRED, feeds nearly full, resetting joker." Add another two tick marks to the count of times the class A could have been prevented.

I have a fairly good recollection of how everything occurred after the "Knock it off" call on our last BFM set. The one thing that I can't specifically recall is when I received the FUEL LO caution. The data shows it popped during the final BFM set and that I extinguished the master caution and continued fighting. Without a doubt, the FUEL LO caution came on at a time much earlier than it should have, but I didn't make the connection. Had I merely mentioned the caution to my flight lead (or later on to the SDO) A/C 210 would still be on the flight line. After fencing out we were just northwest of the field, in what you could almost call a wide downwind, setting up for the initial to runway 32L. After a fan break, I made my call, "Dash two, gear," as I watched the three gear lights illuminate, then completed my landing checks.

At the 180 I began my approach turn when I suddenly lost my AOA-bracket and received an FCS Caution. Had I glanced at my right DDI, I would have seen a four-channel AOA failure. This is a perfectly safe condition to land the plane with. I could have maintained an airspeed equivalent to on-speed AOA, recognizing that the AOA-bracket and AOA indexer lights would no longer be present. In the groove as my flight lead touched down, I notified tower that I would be executing a wave-off, I didn't feel comfortable landing.

I told my lead why I had waved off and he prompted me to take a look at my FCS page. Sure enough, it indicated that I had a four-channel AOA failure. As I began a climb to 2000 feet in order to troubleshoot, my lead and I both switched our Aux radio to the base frequency to go through the procedures with the SDO. The SDO started by asking which cautions I had. I informed him only of the cautions relevant to my wave off—another huge tick mark. We methodically stepped through the four-channel AOA procedures, which took about two turns in holding overhead.

By the time I was turning toward downwind to set up for the straight-in, my fuel was reading a 1.9 and Tower had just cleared another jet into the break. ATC and my flight lead both came up on my PRI and AUX radio at the same time and I was unable to hear either of them. After sorting out the radios I realized I was cleared to land on my straight-in approach and that my flight lead wanted me to inform Tower that I was priority fuel, nearing emergency if I did not land immediately. Neither of us realized that I had long passed priority fuel. The time to declare emergency fuel would have been after receiving the FUEL LO caution. I began to turn toward a base leg.

This is when I finally saw that the dominoes were falling. I noticed that my airspeed was at 116 knots, about 15 knots slower than it should have been. I immediately pushed the nose over and placed my throttle forward to try and regain my airspeed. I didn't feel the jet respond as it should have and I made a call to my flight lead, "I'm losing it, Sir." The final indications that I saw from a quick scan of my displays were 106 KIAS airspeed in the HUD, a 1.7 fuel load on the EFD, and an L FLAMEOUT caution on my left DDI. Just after I saw the L FLAMEOUT caution, everything in the jet turned off. It was the most terrifying silence I've ever experienced. I knew that I must have lost both engines. I didn't get any response from the throttle or stick and stared for a moment at the farm below that I was plummeting towards. I couldn't believe that I was going to have to eject. I placed my PCL from my lap to the side, assumed the proper body position, and pulled the handle.

A few months later my CO gave me a book with a collection of stories from people who have had to bail out of their airplanes. Almost all of the stories I've read on the subject involve some sort of fire fight or a systems problem with the airplane that was out of the pilot's control. In my case, it was one switch being in the incorrect position. A switch that may have been hard to see on preflight but could have been caught on multiple occasions throughout the flight. It turns out that I had flown a different jet with the switch in that position two weeks earlier and received a FUEL LO two minutes prior to landing. This means that you can double the amount of times that I missed the switch and the significance of the caution. The first time I got lucky and landed without incident. I should have declared an emergency and asked the question on deck. I also could have looked it up in NATOPS and realized that what I saw was abnormal. Instead I didn't communicate and didn't follow up, allowing the same issue to come back to haunt me in a different jet on a later flight.

There are some that I've told this story to who have said that it easily could have been them. Most say they would have missed the INTR WING switch being in the INHIBIT position during their cockpit sweep and start up. Many others have said they could have missed the fuel checks while executing BFM in the MOA. What it really comes down to, in my mind, is that I received a FUEL LO caution and didn't recognize that it was abnormal, or at the very least communicate that I had received it. It's a tough lesson learned. Hopefully those who will continue to fly can learn from my mistakes.

"I couldn't believe that I was going to have to eject. I placed my PCL from my lap to the side, assumed the proper body position, and pulled the handle."

25 YEARS

25th Annual Joint Safety and Environmental Professional Development Symposium

April 24 - 28, 2017

Presented online by the Naval Safety and Environmental Training Center

The Armed Forces' premier Symposium for professionals in the fields of Safety, Industrial Hygiene, Public Health, Environmental Stewardship, and Energy Management

LEARN CONNECT GROW

2000+ Attendees

180+ Sessions

100% Virtual

FREE No Cost

CEUs Available

CALL FOR SPEAKERS: http://jointpds.adobeconnect.com/speakers

TO REGISTER: http://jointpds.adobeconnect.com/register

NAVAL SAFETY ENVIRONMENTAL TRAINING CENTER

If you have any questions please contact the PDS 2017 Coordinator at:

sheldon.griffin@navy.mil (757) 445-8778 x 344

MECH Bravo Zulu

Sailors and Marines Preventing Mishaps

PO2 MARK WASHINGTON

While performing an inspection of an F/A-18E Super Hornet, PO2 Mark Washington discovered a wire harness was chaffed and arching against a fuel pressure sensor. The exposed wire harness, if not discovered, could have led to a fire in the fuselage. PO2 Washington's adept attention to detail prevented a possible Class "A" mishap..

SN ALFONZO HOWELL

While performing a final ordnance check of a 5-wet ARS configured Super Hornet on a catapult of the USS Ronald Reagan, SN Alfonzo Howell recognized the aircraft did not have any cartridge activated devices (CADs) installed. Displaying decisive action, he notified the CAG Gunner of the major discrepancy. SN Howell's attention to detail and proper pre-catapult inspection prevented a possible Class "A" mishap.

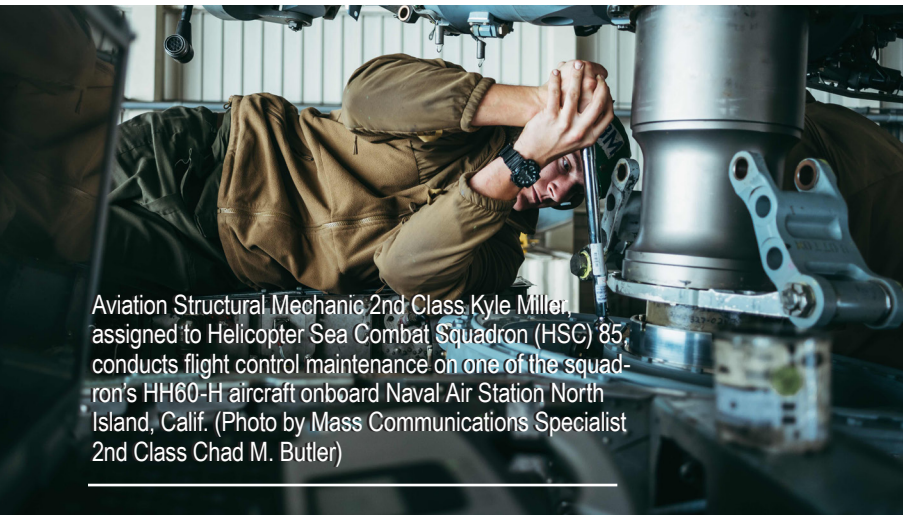
AD2 MELISSA CASTILLO

While performing a FOD and Fastener Inspection on Bear Ace 603, AD2 Meliss Castillo discovered loose screws on top of the port motor's chin cowling. These screws are directly above the engine intake, so had they had been overlooked, the screws could have been ingested by the intake and seriously damaged the engine. Petty Officer Castillo's attention to detail not only prevented damage to the aircraft, but also emphasizes the diligence required in a thorough aircraft inspection.

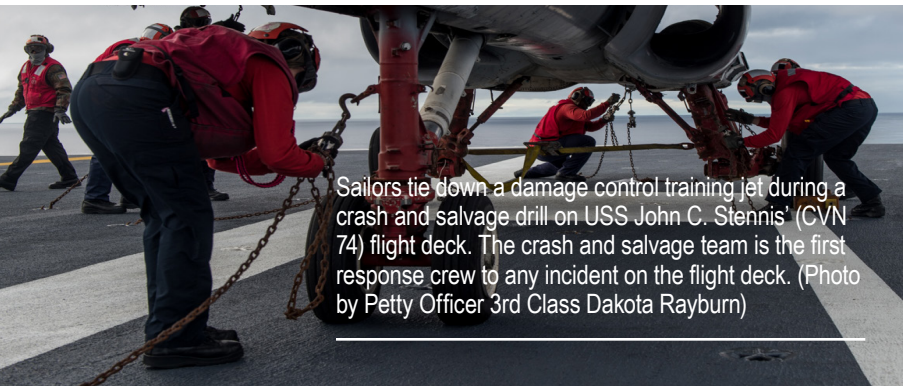
AM1 DAVID GRONLUND

While in the parking lot in front of the squadron hangar, AM1 David Gronlund noticed a crack in a fire main valve. Taking the initiative, he immediately notified the Safety Department, who inspected the valve and then directed the initiation of a work order to repair it. Due to AM1's attention to detail and initiative, efforts were set in motion to repair the valve which could have resulted in a potentially dangerous situation had it failed.

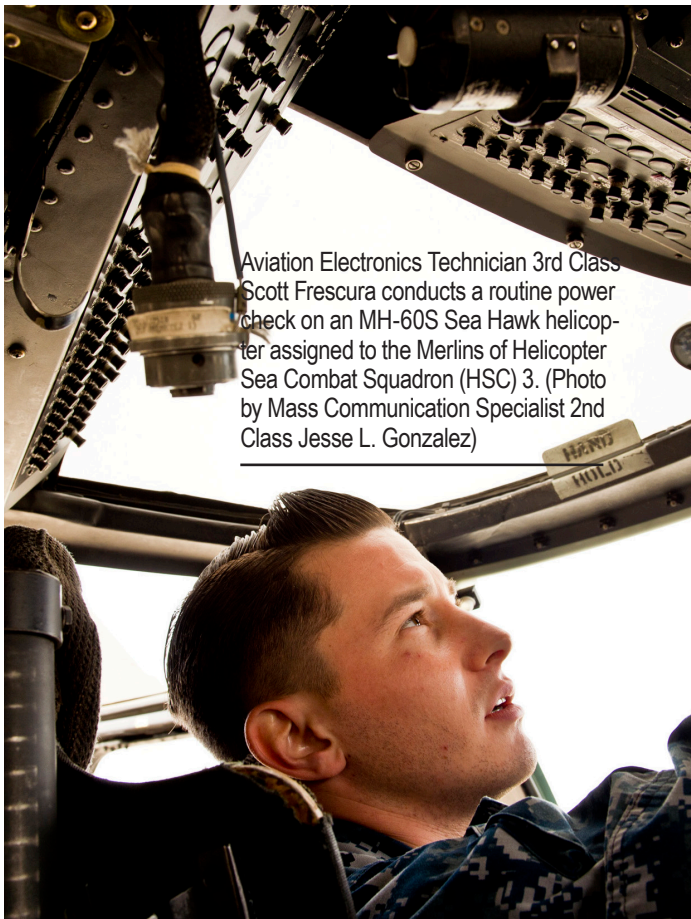
Seaman Jace Anderson, left, and Seaman Cory Johnson wash down an MH-60R Sea Hawk helicopter assigned to the Swamp Foxes of Helicopter Maritime Strike Squadron (HSM) 74 on flight deck of the aircraft carrier USS Dwight D. Eisenhower (CVN 69). (Photo by Petty Officer 3rd Class Nathan T. Beard)



Aviation Structural Mechanic 2nd Class Kyle Miller, assigned to Helicopter Sea Combat Squadron (HSC) 85, conducts flight control maintenance on one of the squadron's HH60-H aircraft onboard Naval Air Station North Island, Calif. (Photo by Mass Communications Specialist 2nd Class Chad M. Butler)



Sailors tie down a damage control training jet during a crash and salvage drill on USS John C. Stennis' (CVN 74) flight deck. The crash and salvage team is the first response crew to any incident on the flight deck. (Photo by Petty Officer 3rd Class Dakota Rayburn)



Aviation Electronics Technician 3rd Class Scott Frescura conducts a routine power check on an MH-60S Sea Hawk helicopter assigned to the Merlins of Helicopter Sea Combat Squadron (HSC) 3. (Photo by Mass Communication Specialist 2nd Class Jesse L. Gonzalez)

Seaman Brett Holland directs an MH-60S Sea Hawk assigned to the Chargers of Helicopter Sea Combat Squadron (HSC) 14 for takeoff from USS John C. Stennis' (CVN 74) flight deck. (Photo by Petty Officer 3rd Class Cole C. Pielop)

MAINTAINERS IN THE TRENCHES

BY AD2(AW) COREY ROY, VFA-192

Dragon in Distress

We were 12 days into tailored ship's training availability (TSTA) onboard the USS Carl Vinson (CVN-70). It was the average "Groundhog Day" of maintaining aircraft, waiting in line to eat, and going to sleep, just to do it all over again. Complacency had truly set in. Near the end of our shift, we were finishing up our repair job on dragon 300 so that the oncoming shift didn't have to take over half way through a job, allowing them to concentrate on the flight schedule. Our power plants work center was finishing up a nearly three month special inspection when one of the mechs said to me, "AD2, just go in and let maintenance control know we're almost done. We can finish installing the fasteners." I agreed and thought to myself, "I have to come back out when they finish and CDI the work."

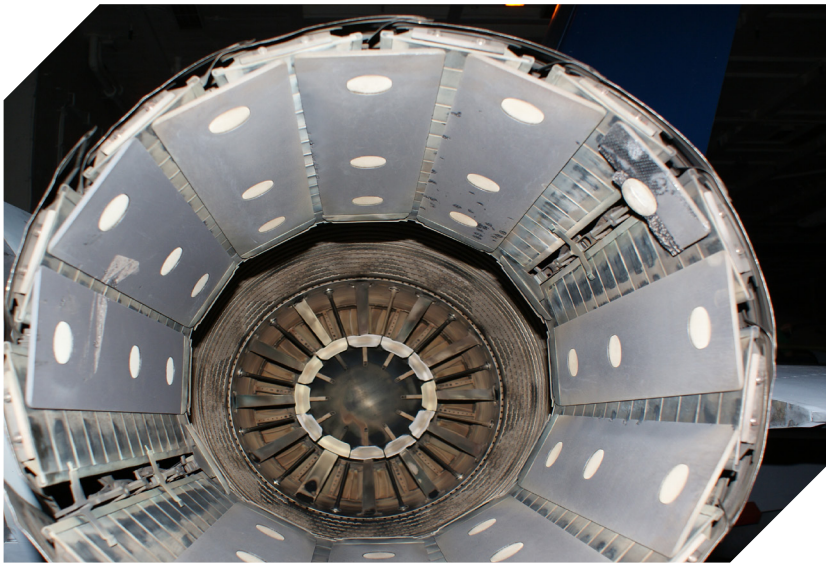
Just after I got to the maintenance desk, one of them ran up and told me, "There's something you have to see." We headed back out to hangar bay 2 and dragon 300, which had flown onto the ship several days earlier. He showed me that the starboard engine variable exhaust nozzle (VEN) eight o'clock position secondary seal was missing, three-fourths of the two o'clock position was missing , and the nine and 10 o'clock position secondary seals were nearly cracked in half. We stood staring at it in confusion. How could this have happened? How was this missed?

Our initial response was to look into the historical work orders to find what work had been done. Dragon 300 joined us on the ship about two weeks into TSTA.

We hadn't performed any maintenance on the starboard engine VEN since a 200 engine hour inspection three months prior. The jet had not flown for the previous two months due to some hard downing discrepancies; heavy corrosion gripes, and fuel cell leaks in tanks 3 and 4. The jet had only been flown on a functional check flight (FCF) in Lemoore and then out to the ship in those two months.

Back on the ship, as soon as 300 landed and moved to the hangar bay, the exhaust covers were installed, hiding the damaged VEN. After discovering the missing seals, we immediately notified maintenance control. Quality assurance (QA) promptly began their investigation. As for the damage, both the power plants shop and QA agreed that a loose one-fourth inch nut was responsible for the damage. We believed that the nut was not tightened all the way and the force of the exhaust dislodged the eight o'clock secondary seal. When it came loose, it hit the 2 o'clock position which loosened that secondary seal, and in turn, flung it across and hit the nine and 10 o'clock position. Quality assurance's investigation, along with the day check maintenance crew, discovered a secondary flap and base were also damaged.

This incident reminded us to always ensure that every nut and bolt is tightened appropriately. Each part of the aircraft, whether an engine mount or a panel cover, is critical to the safe operation of the aircraft. It is paramount that each component is installed in accordance with the appropriate publications. A single loose nut can cost a squadron man hours and parts that we cannot afford.



Damage to a starboard engine variable exhause nozzle left maintainers in a state of confusion during a routine check. They later discovered that a loose one-fourth inch nut was responsible for the damage. (Photo courtesy of VFA-192)

BY LTJG LUKE GUNDERSON, HSC-14

Routine Maintenance Gone Awry

Our primary mission in aviation maintenance is to provide safe-for-flight full-mission capable aircraft in support of our combat readiness. Safety is a cornerstone of preserving combat readiness and saving lives. We must focus on safety both in the work we do and the equipment we use, including the repair of damaged equipment to save lives and money. Common sense should dictate that we draw a line between repairing versus replacing equipment, especially when the safety of the maintainer becomes an issue.

During a deployment, an aviation electrician (AE) was completing a routine blade fold switch adjustment as part of a phase-D inspection. The aircraft was in the hangar bay, connected to external power while the AE attempted to adjust the blade fold switch with a blade fold test unit box. While on top of the aircraft, the AE pulled the test box by its external power cord for extra slack with their right hand. As the AE tugged for more slack with their right hand and held the test box with their left hand, the shell back connecting the power cord to the test box arced and electrocuted the AE. Due to the intense heat and force of the arcing, the external power cable attachment melted and completely detached from the box. As a result, the AE looked down to find burns on their left hand. The AE's fellow maintainers reacted quickly to disconnect external power from the aircraft and get him medical attention. The AE spent one day sick in quarters (SIQ) and three days on light limited duty (LLD).

During the ensuing investigation, it was determined the AE shop had previously repaired the blade test set power cord. The cord had undergone a 56-day inspection, just four days earlier, passing all applicable tests with no known discrepancies. However, since the previous repair was on the internal wiring, there was no way to determine that the wires had twisted, which eventually led to the short at the shell back.

Because of this mishap, HSC-14 squadron personnel shall no longer repair damaged cords themselves but instead, should either properly dispose of the cord or turn it into AIMD for repair or replacement. This is a case of using the right person for the right job. Only by using power cords that have been repaired by a certified technician; will we ensure that our maintainers aren't subjected to electric shock while conducting routine maintenance.

During a routine blade fold switch adjustment, an aviation electrician's hand was electrocuted. The intense heat and force of the arcing caused the external power cable attachment to melt and detach. (Photos courtesy of HSC-14)

BY LTJG LOGAN SPRAGUE, HSM-51

Small Crack

It started out like every other morning on deployment. Warlord 03 had just completed a post B phase functional check flight (FCF) the day prior. She was ready to support operations on the USS MUSTIN (DDG 89). The maintenance crew of HSM-51 Detachment 2 was looking forward to seeing the product of their hard work back in the air.

All of the proper checks were completed in the hangar and Warlord 03 was traversed to the maintenance line. Following the tail being spread and stabilator unfolded, it came time to spread the main rotor blades. With a spread-qualified maintainer in the aircraft, wing walkers and safety observer in place, the maintenance team was ready to begin. The spread sequence started and the blue and black coded blades slid into place. As designed, the blade lock pins drove into place and the pitch lock pin retracted. However, the red blade stalled over the engine exhaust cowling as the yellow blade spread fully. Suddenly the stalled red blade dropped, causing it to impact the satellite communication (SATCOM) antenna and fuselage.

The damage caused to the SATCOM antenna alone would have been a downing gripe on the aircraft but the larger issue was the damage to the rotor blade. The rotor blade had some chips on the trailing edge with some smaller dents throughout. The blade failed the coin tap test and was well out of dent limits on what is allowable on a rotor blade. The cost of replacing a single main rotor blade is $200,000, leading to classification as a class C ground-related mishap. Fortunately, the damage to the blade was depot level repairable, driving the monetary cost down and the mishap class to drop from a C to a D.

Big Costs

Once the initial notifications were complete, it was time to determine what caused the blade to drop. Looking over the rotor head, it appeared the blade lock pins were driven in and the pitch lock pin had been retracted, all before the blade was in the proper position. This pointed to the problem being with the blade fold motor assembly.

The blade fold motor assembly contains two separate main gears. The segment gear is used to fold and spread the blade; the spur gear drives the blade lock pins in and out.

There is also a sensor on the blade lock pins that tells the system they are extended and that the pitch lock pins can be retracted. After removal of the blade fold motor assembly, it was difficult to turn in any direction. Investigation found that the segment gear skipped teeth inside the blade fold motor assembly, which then caused the spur gear to start driving the blade lock pins in prematurely. Once the blade lock pins completely drove in, the system logic commanded the pitch lock on the red blade to drive out and allowed the blade to drop.

In the dynamic world of helicopter aviation, material failures can happen. However, it is unusual for a component failure to cause significant damage to another part. In this case, if the motor had failed in any other way the blade would have just stopped instead of falling. If the motor had spread just a little bit before failing then maybe the blade would have missed the aircraft completely. Make every effort to plan for every single failure or contingency. Peform maintenance by the book, every step every time, and hopefully avoid injury to personnel. At the end of the day no one can fault you for doing the right thing.

The images above show the damage to the rotar blade mentioned in the article. The cost could have been upwards of $200,000 but it was repairable and went from a class C to class D mishap . (Photos courtesy of HSM-51)

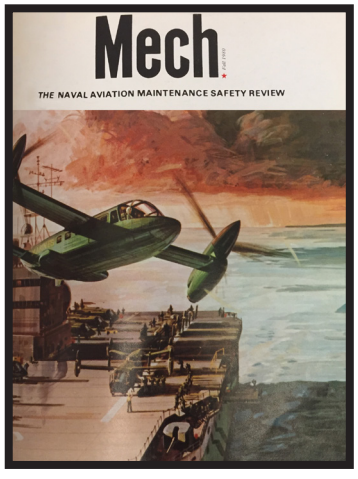
57 Years of Aviation M
Maga

The first issue of Mech was less like a magazine and more like a safety manual. It featured a mechanic on the cover and the magazine the pages included analysis and statistics covering a wide range of maintenance safety topics.

1960s

In the 1970s Mech actually included study material for maintainers to use in their every day lives at work. At the end of each session there were questions with answers provided. The magazine got an early start on safety related infographics.

1970s



By the 1980s Mech was published as a magazine vs. a manual but the staff still relied heavily on the maintenance instructional manuals to inform their target audience. It also featured stories from the fleet written by Sailors who had experienced a mishap.

1980s

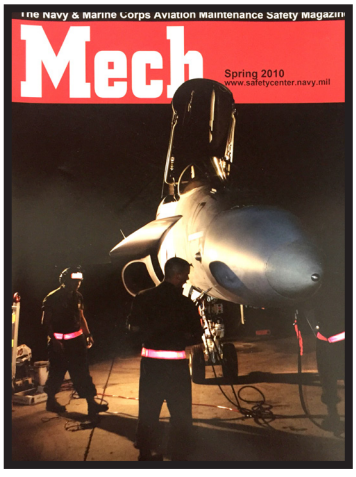
Mech was mostly in color by the 1990s but it was primarily only used on the front cover. The magazine was more visually appealing with the use of artist depictions. Each issue consisted of a note on the importance of the technical publications library.

1990s

Maintenance Safety zines

With a full color digitally designed magazine, the Mech was down to a staff of four and it featured less illustrations and more digital photos taken by Navy photojournalist. The articles were more in depth and reflected the changing state of mishaps in the fleet.

2000s



In 2010 the editor of Mech was LT David Robb. Prior to then, the magazine was edited mostly by civilians. The magazine took on an entirely new look and flag design with the red banner to signify the importance of aviation maintenance safety.

2010s

By 2013-15 the magazine took on another slight change in look and staff. John Williams, the visual information specialist was the sole staff member until Nika Glover, the editor, came on board in 2015. The magazine featured full color pages with numerous photos to go with the articles. Most of the articles were personal accounts of sometimes harrowing and life-saving events.

2013-15

In 2016 Mech was merged with Approach so that it would benefit both pilots and maintainers. The magazine was cut in half with Mech conitnuing to focus on maintenance related safety subject matter. The magazine will go completely digital in March 2017. By 2018 the magazine will be fully merged with the other Naval Safety Centers publications.

Present

Navy MWR
DIGITAL library

Available **24/7/365**!

Careers CLEP ASVAB

Tutoring **FUN**

Ancestry

e-book DIY Magazines Fitness

NavyMWRDigitalLibrary.org

Borrow, Read and Return Online!

Navy General Library - A CNIC Quality of Life Program
202-433-9802 / DSN 288 • nglp@navy.mil

MWR

CNIC
★ FLEET ★ FIGHTER ★ FAMILY

MECH

The Navy & Marine Corps Aviation and Maintenance Safety Magazine

2016 Volume 61, No. 3

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

Approach-MECH Staff

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

Aircraft Maintenance and Material Division Head

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

Avionics/ALSS Branch Head

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

Aircraft Maintenance Branch Head

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

Group Ring

safe.avnfdbk@navy.mil Ext. 7812

Approach (ISSN 1094-0405) is published bimonthly by Commander, Naval Safety Center, 375 A Street Norfolk, VA 23511-4399, and is an authorized publication for members of the Department of Defense. Contents are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense, or the U.S. Navy.

Postmaster: Send address changes to Approach-MECH, Code 70C,
Naval Safety Center, 375 A Street
Norfolk, VA 23511-4399
Send article submissions, distribution requests, comments or questions to the address above or email to: SAFE-Approach@navy.mil and SAFE-Mech@navy.mil

MECH

On the cover: Aviation Boatswains Mate (Handling) 3rd Class Dylan Mills directs the crew of a C-2A Greyhound from Fleet Logistics Support Squadron (VRC) 30 (Photo by Mass Communication Specialist 2nd Class Sean M. Castellano)

NAVAL SAFETY CENTER ONLINE MAGAZINE SUBSCRIPTION

Please provide the requested information below and return to us.
Print and fax to: (757) 444-6791
Save and email to: SAFE-MediaFdbk@navy.mil
Contact the Media Division: (757) 444-3520, ext. 7870

Mail to: COMMANDER
ATTN MEDIA DIVISION (CODE 70)
NAVAL SAFETY CENTER
375 A ST
NORFOLK VA 23511-4399

SUBSCRIBER INFORMATION

		TODAY'S DATE	
UNIT		UIC	
POC NAME		POC TITLE	
POC PHONE		POC EMAIL	

TYPE OF REQUEST:	CHOOSE MAGAZINE	MAIL DVD? IF YES PROVIDE ADDRESS	ADDRESS:
☐ NEW	☐ APPROACH	☐ MAIL ☐ ONLINE	
☐ MODIFY COPIES	☐ RIDE	☐ MAIL ☐ ONLINE	
☐ CHANGE OF ADDRESS	☐ MECH	☐ MAIL ☐ ONLINE	
☐ CANCEL SUBSCRIPTION	☐ SEA & SHORE	☐ MAIL ☐ ONLINE	
☐ OTHER (Provide Instructions)			

(PLEASE NOTE: IF YOU CHOSE TO RECEIVE A DVD,YOU WILL AUTOMATICALLY BE MAILED THE NAVAL SAFETY CENTER'S FLAGSHIP MAGAZINE, 360SAFE ALONG WITH YOUR MAGAZINES OF CHOICE.)

MECH

Aviation Boatswains Mate (Handling) 3rd Class Dylan Mills directs the crew of a C-2A Greyhound from Fleet Logistics Support Squadron (VRC) 30 (Photo by Mass Communication Specialist 2nd Class Sean M. Castellano