THE NAVY AND MARINE CORPS AVIATION SAFETY MAGAZINE

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AVIATION SAFETY

32

PAGES

1094-0405

REPOSITIONING FLIGHT DURING COVID-19

Providing insight into the complication of REPO-ing during the pandemic.

PAGE 25

...we are your safety advocate

MISSION

To preserve warfighting capability and combat lethality by identifying hazards and reducing risk to people and resources.

COMMANDER`S NOTE

REAR ADMIRAL "LUCKY" LUCHTMAN

Naval Aviation professionals,

The start of a new year brings with it an opportunity for reflection – a chance to look at how we handled challenges, to assess areas for improvement and to recognize the achievements we accomplished.

Although 2020 definitely brought its share of challenges – many of which we had never encountered before – our Sailors, Marines and civilians adapted and continued to accomplish the mission, exceeding the standard. I am extremely proud of all that you have done and continue to do.

As we move forward in 2021 with the knowledge, experience and lessons learned from the previous year, I ask that you keep safety at the forefront of everything you do. Continue to lead by example and communicate the importance of a culture of safety not only through your words, but also your actions.

When you lead by example, you sustain a standard that can help reduce preventable mishaps and ultimately preserve fleet readiness. There's no doubt we will continue to face challenges, but preserving and maintaining our readiness is essential to adapting and overcoming the unknown challenges ahead. We need each and every one of you to accomplish the mission successfully, so it's critical we work together to protect our most valuable resource of all: our people.

At the Naval Safety Center, we continue to serve as your safety advocate and stand ready to assist in preserving readiness and saving the lives of Sailors, Marines and civilians who continue to tirelessly defend our nation.

I am honored to serve alongside each and every one of you and I look forward to all we will accomplish this year.

Maria, Julianna and I wish you all the best for 2021!

FEATURES

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Mishaps cost time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help ensure personnel can devote their time and energy to the mission. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. *Approach* (ISSN 1094-0405) and (ISSN 1094-0405X online) is published quarterly by Commander, Naval Safety Center, 375 A Street Norfolk, VA 23511-4399 and is an authorized publication for members of the Department of Defense. Contents are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense or the U.S. Navy. Photos and artwork are representative and do not necessarily show the people or equipment discussed. We reserve the right to edit all manuscripts. Reference to commercial products does not imply Navy endorsement. Unless otherwise stated, material in this magazine may be reprinted without permission; please credit the magazine and author. *Approach* is available for sale by the Superintendent of Documents, P.O. Box 979050, St Louis, MO 63197-9000 or online at: bookstore.gpo.gov. Telephone credit card orders can be made 8 a.m. to 4 p.m. Eastern time at (866) 512-1800.Periodicals postage paid at Norfolk, Va. and additional mailing offices. Postmaster: Send address changes to *Approach*, Code 52, 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.**

U.S. Marine Corps photo by Lance Cpl. Andrew Skiver

Front Cover:

Illustration by Catalina Magee

U.S.Navy photo by BlueBarronPhoto

U.S.Navy photo by Airman 1st Class Andrew Kobialka

Imbalance in the Cockpit

By LT Jake "Rat Basher" Compton

Mass Communication Specialist
3rd Class Dylan M. Kinee

Shortly after checking into my fleet squadron, Helicopter Maritime Strike Squadron 78 (HSM-78), I was sent on deployment with HSM-79 aboard USS Abraham Lincoln (CVN 72) to gain sea-time experience. The majority of the underway involved routine Surface Search and Coordination (SSC) and Armed Search and Reconnaissance (ASR) missions. After the second month, the inevitable "Groundhog Day" feeling set in. It was around this time that I was scheduled to fly with a lieutenant commander from the Carrier Air Wing staff. He was a former Fleet Replacement Squadron (FRS) instructor, typically considered the community's best pilots. I had flown with him before with no issues and I had no problems before this flight.

It was a day flight with clear skies. We were informed the aircraft was experiencing Automatic Flight Control System (AFCS) errors during the hot seat. The issues were not serious enough to switch to another aircraft, so the maintainer made a note to pass on the issue to the next crew. After takeoff, we began our mission to identify, classify and track all the necessary contacts. Approximately an hour into the flight, our Master Caution light illuminated with an AFCS Degraded caution. The issue was a failed turn coordination function in the AFCS system.

Photo by Petty Officer 2nd Class Colby Neal

Mass Communication Specialist
3rd Class Michael Singley

This function is used to keep the aircraft in balanced flight during forward flight regimes. The crew executed our memory items, used our checklist and decided to continue the mission with a slightly degraded AFCS.The helicopter aircraft commander (HAC) decided to conduct a controllability check. He rolled into a 20-30 degree angle of bank turn to check if the aircraft automatically coordinated the turn. It did not. All attempts to clear the failure were unsuccessful.

After approximately 5-10 minutes of troubleshooting, the HAC continued to roll into exaggerated uncoordinated turns out of enjoyment and curiosity. This became uncomfortable and gave me a gut feeling that what was happening was not safe. I asked him to stop rolling into uncoordinated turns and center the 'ball' when flying. We continued our mission until it was time to return to the ship. We transited at the standard 120 knots indicated airspeed (KIAS) and 150 feet to return to the delta pattern for landing. At this time, the aircraft warning tone for a stab auto mode fail began to beep loudly in all headsets and the aircraft pitched nose-down. The aircraft commander was at the controls and he verbalized the memory items while my hand shot to the manual slew switch to adjust the stabilator (STAB) angle to the zero degree position. I used our Pocket Checklist (PCL) for the remainder of the emergency procedure. We completed each step and regained STAB auto control. At this point, we were not in any landing criteria, so we flew back at 70 KIAS and returned to the Port delta pattern. After the STAB emergency, I was on edge. Stabilator failures at high speed will result in loss of control of the aircraft if immediate pilot action is not taken. Because of this, STAB failures are extremely uncomfortable, especially at high speeds and low altitudes. As we orbited the pattern, the aircraft guard helicopter also entered the delta to prepare for landing. Speaking on the helicopter common frequency, the two HACs discussed what occurred and how our aircraft experienced AFCS and STAB issues.

At this point, my HAC decided to show the aircraft guard helicopter that our aircraft wouldn't coordinate its turns.

He aggressively rolled into a 30-degree angle of bank uncoordinated turn and told the other helicopter to "look." After already having an AFCS emergency in a dangerous flight regime, I was very frustrated with this course of action. I shouted over the ICS system, "STOP!" I explained his actions induced more stress on the system for a useless demonstration. The system failures were related to the lateral acceleration input to the STAB system. The Automatic Flight Control Computer (AFCC) uses a formula consisting of lateral acceleration, collective position, airspeed and pitch rate to adjust the STAB to each flight regime's best position. During an uncoordinated turn, the lateral acceleration is different than when the aircraft is in a coordinated turn. The difference in lateral acceleration in this instance can result in a STAB auto mode failure. After that quick conversation, we continued with the coordinated flight to an uneventful landing.

Tensions were a little high, but lessons were learned from this flight. Never be afraid to be assertive if a situation seems uncomfortable, even if you're the one with the least experience. Anyone in the crew can recognize a dangerous situation. Know your systems and how they are related. A strong understanding of aircraft systems is integral to the decision-making process.

Lastly, just because someone has a few thousands of hours, does not make them infallible. There is no rank in the cockpit. If something seems like a bad idea, it probably is.

The Importance of Understanding Your Fuel Ladder

By LT Kyle "Akamay" Corbett and LT Sean "XEROX" Ryan • VAQ-139

Left Image: LT Kyle "Akamay" Corbett / Courtesy of VAQ-139
Right Image: by LT Greg 'Benz' Oh, USN VAQ-139

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"It was a beautiful, sunny day in July and we were going out to get a good deal day Tactical Intercept flight. Startup, launch and transit to the working area went as advertised. Everything seemed great until it wasn't and it became the scariest flight of LT CORBETT'S life."

I was 15 miles from lead when I turned in to set up for the fight and got that sound that makes every aircrew cringe, the deedle-deedle of the master caution light. We had an R ENG caution, knocked off the flight and I started going through the checklist. My Electronic Warfare Officer broke out the checklist and ensured that all the proper procedures were completed. Our lead then came to join us for an inspection. During the join lead asked if our dumps were on; we made sure they weren't and told the lead so.

After further inspection, the lead aircraft determined that maybe we have been producing contrails from our engines as the white mist they saw began to dissipate. At this point, we decided it would be best to head back to the ship and start getting our squadron representative involved in the situation. We were feeling pretty comfortable on fuel, which we would later discover was a mistake.

Flying back to the ship, we contacted our representative and let him know what was going on: that we had everything under control and planned on returning to the ship with the affected engine at idle for a half flaps straight in. Instead of climbing to a high-holding altitude, we elected to stay at our medium-holding altitude and go over our single-engine approach procedures to ensure we had everything suitcased well ahead of time.

Eventually, while overhead, our lead, alerted us to the strange conning again coming out of our engine. We didn't think much of it as we were two newer aircrew, new to flying around the ship and just trying to ensure we had a good plan to come aboard safely. After our lead felt satisfied that our jet and plan was sound, he waved us off. Thirty minutes until the recovery we recommended and climb to a higher altitude to conserve gas. After trying to climb above 18,000 feet with a single-engine, I realized we were wasting gas and time and I elected to level off. At this point, we decided to get gas, just as a precaution. After talking with the tanker, we were told we would have to wait until the launch was complete to get fuel. We just accepted this scenario.

Mom directed us to head 10 miles aft of the

ship and wait for the recovery.
It was here we realized we were rapidly approaching and probably about to go below the ladder. We split the radios. The EWO started working on a gas plan and I started working on a plan to come down first rather than last, as gas was now a more significant concern. The lead had been tracking our gas and realized we were burning way more fuel than expected. While talking with the representative, the seriousness of the situation occurred and we informed them that we were currently "On-ladder, with a negative trend." This communication led to a lot of confusion and did not clarify the situation. Had we said we were burning more fuel than expected, it may have been much easier for outside sources at 1G to realize that we had a fuel leak in the starboard engine. As aircrew, tracking fuel should have been our highest priority; unfortunately, fuel fell out of our scan while setting up for the straight in to the ship.

Finally, we got clearance to commence. During our approach, we ran up both engines and decided we would use both engines, flaps half, to come in for the landing. Unfortunately for us, with a power call from paddles in close, I boltered. I looked down, realized I was at tank state and was forced to try and tank using one engine. I did not succeed with the basket moving all over the place. I brought up both engines, had the tanker climb for more stable air, during which our low fuel light came on. Having been so concerned about getting in the basket, we never thought to communicate our fuel issue to the ship.

As a result, we got dropped off seven miles behind the ship and tried the approach again. This time we came down for a successful trap. Upon touching down, we received screaming calls from multiple radios to secure the right engine as a tailpipe fire flew out the back of the engine. This was caused by built-up gas from the leak, which lit off when I went to military power on the trap. Then, not thinking anything of it, I made one of the biggest mistakes of the flight. I started to taxi single-engine then came to a stop to get a tow. I quickly realized with the deck crew under the aircraft; I had lost all my hydraulic pressure and brakes, which got their hydraulics from the right engine. I realized I wasn't stopping and executed the loss of brakes on deck boldface and came to an immediate stop. We then secured both engines and got a tow.


U.S. Air Force photo by Airman 1st Class Bryan Guthrie

This whole flight led to some incredible learning experiences for the aircrew involved and the squadron. Fuel is life. When flying around the ship, the number one thing that will keep you alive is keeping the engines on. We immediately should have built a fuel ladder from where we were when the emergency started. Had we done that, we would have been better able to track how quickly we were burning fuel and recognized the need for a pull forward, which would have saved us a lot of time and effort.

Understanding what your fuel burn numbers are should be a critical conversation in every ready room. Communication was key throughout this situation. It needs to be made extremely clear when you are talking with a representative and the ship about exactly what is going on. Anyone that has ever worked on the ship knows that the game of telephone is real. If it is not clear when it first comes from the aircrew, it will become even less clear as it gets passed around. Clarity could have cued a lot more minds into the fact that we had a fuel leak and needed to come aboard much earlier than we did.

Also, when you're flying a pass in an emergency aircraft, you better fly the best pass of your life. My bolter led to an even more dire scenario that could have been avoided if I had just been trapped. Finally, the flight is never over until you are leaving the jet. Don't forget the basics of NATOPS knowledge, i.e., don't taxi with a single engine.

We hope someone, or everyone, receives a good lesson learned and does not make the same mistakes.

U.S.Navy photo by Paul Farley

U.S. Navy photo by Mass Communication Specialist 3rd Class Frank J. Pikul

The Aircraft is Un-landable

By LT Sam Hyder

The operational P-3C may have flown off into the sunset, but P-3C flight ops are still alive and well for VQ-1 at NAS Whidbey Island and not letting up anytime soon. VQ-1 pilots complete syllabus events and proficiency flights in these old war pigs. In most cases, these aircraft are much older than the pilots flying them; I've even flown a aircraft that earned its airworthiness over 50 years before I flew it. That being said, malfunctions and emergencies occur daily, and constant vigilance is a lesson learned early and often.

On this particular day, I was gearing up for a routine night proficiency flight. We had a few hours until nightfall, so we flew south and did a fly-by of Crater Lake in Oregon – highly recommended if you have the chance. As it got darker, we proceeded to Pasco, Washington for approaches and touch-and-goes. The first pilot completed his landings and swapped out for the next pilot, a newly qualified electronic warfare aircraft commander (EWAC). On his first touch-and-go, I adjusted flaps and trim and he called for takeoff power. As we accelerated to our rotation speed, the aircraft began to vibrate abnormally. We knew something was wrong, but we did not know what it was. In the back of my mind, I suspected a tire failure. Initially, the aircraft slightly pulled left. The vibrations increased and the aircraft stopped pulling left. The aircraft was slow to accelerate to rotate speed. Based on our airspeed, power setting, runway available and the tires' unknown state, I could not confirm that we could stop safely on the runway and decided to continue the takeoff. The decision to continue the launch with a known malfunction was not a decision I made lightly, but it proved to be the safer choice.

After rotation, we left the gear down and requested to enter the tower pattern. With the limited light available at dusk, the tower personnel were unable to help us. However, the Runway Duty Officer (RDO) provided valuable insight. The RDO noted large chunks of shredded rubber and broken glass on the runway.

After the fly-by, the RDO reported, "both nose tires were gone, the nose landing gear looks bent and the aircraft was un-landable."

Not exactly something you want to be said about the aircraft you are currently flying in. We coordinated with Air Traffic Control to return to Whidbey. We had a 30-minute transit to discuss how to mitigate the situation.

We visually confirmed our main mount tires were intact, reviewed NATOPS and discussed landing with a nose gear malfunction. We stowed loose gear and had the extra pilot and observer sit in the galley to bring our center of gravity (CG) as aft as possible and declared an emergency. Tower vectored the other aircraft in front of us, assuming that we would FOD out the runway (which we did). For the touchdown, I held the nosewheel off the deck as long as the elevator would let me and then flew it gently to the deck. Once the nose touched down, the excessive vibrations returned. Braking was also delicate because the harder I braked, the more weight would be distributed onto the nose strut. Not wanting to test how much weight it could take, I slowed gently utilizing reverse to come to a complete stop. We then taxied clear of the active runway. We would have been justified parking on the runway, but we felt stable enough to continue another 200 feet to get clear of the active runway. I set the brake, shut down and waited for our maintenance team to meet us.

Two critical points were the greatest hazard to us: the touch-and-go and the final landing. For the touch-and-go, situational awareness of aircraft state and the remaining runway were crucial to the near-instantaneous decision. Could I have aborted with the remaining runway? Maybe. For a different malfunction, I had enough remaining runway to stop the aircraft safely.The unknown status of the tires that sowed the seeds of doubt in my mind was enough for me to continue the takeoff. If I went the other way, we might have saved ourselves a bunch of headaches, but there was a chance we could have departed the runway or collapsed the gear then and there. I'll never know.

I knew a calm flight-station was paramount and I made every effort to appear composed and focused despite the nerves of worst-case-scenarios inside.

Second, the final landing was a unique and non-standard challenge. Crew Resource Management (CRM) was beneficial, with everyone chipping in creative ways to mitigate the risk with the landing. I knew a calm flight station was paramount and I made every effort to appear composed and focused despite the nerves of worst-case-scenarios inside. Upon touchdown, I made sure to slow as much as possible with the nosewheel off the deck, but not too long where I would lose elevator authority and slam the nose strut onto the runway. At that point, the P-3 proved that 1950s engineering could stand the test of time and brought us back with a landing we could walk away from.

We hung around until 0400 the next day, going through the mishap investigation steps. The conclusion was the failure of the nose tires, with the taxi lights shattering from the debris. This flight could have ended much differently and we're grateful it didn't. Of all the lessons from this event, the most essential would be the importance of keeping your guard up, especially on "routine" flights.

U.S. Navy Photo by: PH2(AW) Elizabeth L. Burke

Tropical Diversion

"Our V-22s were to rendezvous with USS Kearsarge (LHD 3), already offshore near Puerto Rico."

By Capt Justin Walker

"My squadron, Marine tiltrotor squadron (VMM) 365 (reinforced), was still attached to the Marine expeditionary unit (MEU) and we were all still on post-deployment leave when the text message came confirming our recall for defense support of civil authorities on Puerto Rico."

U.S. Navy photo by Mass Communication Specialist 3rd Class Aaron T. Smith
Illustration by Catalina Magee

Our V-22s were to rendezvous with USS Kearsarge (LHD 3), already offshore near Puerto Rico. The specific scheme of maneuver was to depart Marine Corps Air Station New River, N.C., fly south along the east coast and then follow the island chains to Puerto Rico and the ship. My flight was together as a four-aircraft division to Guantanamo Bay, Cuba, (GTMO), where we planned our second fuel stop. A hydraulic leak coupled with a sensor failure grounded my aircraft at GTMO. The other V-22s continued to Puerto Rico. A maintenance crew was flown back to GTMO from the ship the next day. Four days later, we were up and running and departed for Puerto Rico.

With a crew of five and four maintenance Marines as passengers, we took off without incident and departed Cuban airspace. Flying northeast between Cuba and Haiti, we climbed up to 9,000 feet to take advantage of the wind, keep communication with Miami Air Traffic Control (ATC) and stay below oxygen restriction altitudes for our passengers.

About 45 minutes after takeoff, I began updating our divert airport in the cockpit management system (CMS). I settled on Grand Turks Airport on Turks and Caicos, but not before I had made a note of another airport in the system, Cap Haitien Airport (MTCH), on the north shore of Haiti and about 25 miles closer to our location. I decided Grand Turks would still be a more ideal divert, despite the greater distance. Less than five minutes later, we received a caution from the CMS. The cockpit display unit (CDU) read "Proprotor Gearbox Low Pressure." A glance at the gauge revealed an ominous indication -- the pressure was, indeed, in the caution range. Not only that, it was oscillating and steadily decreasing. Our next actions as a crew were quick and instinctive. I began a gradual right turn to the south and requested the aircraft commander (TAC) dial Cap Haitien into our navigation system.

We were 75 miles away from Haiti. In the V-22, many of even the most severe emergencies are survivable in the air. An inter-connecting driveshaft system allows both propellers to turn during a single-engine loss. A failure of a gearbox, however, is more urgent. The V-22 has five main gearboxes throughout the drive system and a failure of any one of them would result in, at best, a split system and power loss on one side, or at worst, a seized drivetrain and total power loss.

Everyone in the crew recognized the severity of our situation. Turks and Caicos was a more appealing place to spend the night, but Haiti was 25 miles closer and we would be lucky if we even made it there.

I instinctively pulled some power out and established a very gradual descent at 200 nautical miles toward Cap Haitien. The TAC began communication with Miami ATC, but at this point, our reception with them was dwindling and it was clear they didn't hear everything we said.
We didn't have the tower frequency for Cap

Haitien and between flying the aircraft and working through the emergency checklist, we didn't have the time to look for it. The TAC asked Miami ATC for Cap Haitien's frequency. Again, garbled response. There wasn't time to waste messing about with ATC courtesies, so as the TAC completed the steps in the emergency checklist, I punched 7700 into the transponder and declared an emergency with Miami ATC. At some point, before we switched, communication was good enough that they were able to acknowledge our emergency and pass Cap Haitien's tower frequency.

At this point, another relevant V-22 fact: In the event pressure is lost in the gearbox; it is equipped with an emergency lubrication system (ELS) that dumps oil into the gearbox then sends it overboard. ELS is rated to allow 30 minutes of gearbox operation after oil pressure is lost. The progression of this particular emergency is supposed to start with a "Low Pressure" caution, followed by the "Pressure Lost" caution, which is the trigger for activation of the ELS. Unknown to us at the time, the ELS had deployed itself and was in the process of dumping oil into the gearbox and then securing itself. This is what was giving us the pressure oscillations.

As we continued toward Cap Haitien, we mentally prepared for what might happen next. The final step in this malfunction should be the "Gearbox Failure" warning light. This dictates immediate landing. Being over water, this would have meant ditching. A V-22 ditching scenario would be chaotic enough with our extreme downdraft, but I had already noticed large waves below us. I decided to stop looking down at the water since it wasn't helping our situation. Even so, the crew chiefs were already at work in the back, unstrapping the life raft. As an aside, I thought of our passengers.

None of them were connected to the interphone communication system and thus not privy to any events occurring. The only thing they knew was that we were descending much earlier than expected and the crew was busy rifling through emergency checklists and un-stowing the life raft. It must have been an interesting experience for them. As we switched over to Cap Haitien's tower frequency, the land came into view. It was a welcome sight considering the airport adjacent to the beach. The aircraft commander took control in preparation for the emergency roll-on landing.

As we sighted land, we saw the "Proprotor Gearbox Pressure Lost" light. This indicates pressure in the gearbox has fallen below 30 pounds per square inch. We were now one step away from the procedure that dictates immediate ditch. The crew recognized it was still a close call as to whether we would make it. On check-in with the tower, Cap Haitien reported the winds and requested we enter downwind for the north-facing runway. But, we were on an extended final for the south-facing runway. I never heard wind direction but noticed it was less than 10 knots and the Osprey is more than capable of a roll-on landing in any direction with 10-knot winds. A straight-in approach would save us valuable time in the air, so I replied to the tower, "Unable. We will be straight-in."

They were already aware of us being in an emergency, I received no argument from the building. The V-22 isn't capable of landing in aircraft mode and we had pushed off conversion as long as possible, anticipating a significant pressure drop in the gearbox as we pulled nacelles back. When we finally committed to the conversion, sure enough, a marked pressure drop occurred while I conducted the landing checklist.

Just as I finished landing checks, the "Proprotor Gearbox Failure" audible warning blared into all of our helmets. The immediate landing was imperative, but the timing was perfect. We were passing over the numbers to the runway.

After touchdown, we coasted to a stop well down the runway. The gearbox failure emergency dictates immediate shutdown, for obvious reasons and the lone taxiway was several hundred yards behind us. We found a small protrusion on the runway side, pulled over and conducted an emergency shutdown. Neither the aircraft commander nor I wanted to be the pilot responsible for landing the aircraft safely, only to let the drivetrain eat itself while taxiing to the ramp. That proved to be the correct decision since we would only be interfering with a commercial flight leaving Haiti that day that had to side-step around us on takeoff.

We were towed clear of the runway the next morning. The next four days were spent working in the sun, spending nights sleeping under the fuselage and doing our best to communicate our status with the ship. After reviewing the maintenance download, the crew realized we had made many correct decisions. ELS activated early and expended itself in only 14 minutes. We would certainly not have made it to Turks and Caicos. Had we not been diligent in planning the nearest diverts throughout the flight, we might not have even made it to Haiti.

The basics that are hammered home from day one prove, again, worthwhile -- know your memory item emergency procedures and always have divert options.

U.S. Marine Corps photo by Sgt. Sarah Stegall
Illustration by Catalina Magee

GETTING UP TO SPEED WITH EOD

U.S.Navy photos Courtesy of Joshua Antol

By: LCDR Otis "CLOUT" Dunlap, HSC-7

Checking into a command as a new division head (DH) is always exciting. Catching a Carrier Onboard Delivery to meet the squadron in the Atlantic because the Strike Group was conducting a Composite Training Unit Exercise (COMPTUEX), and specifically a "COMPTUEX and go" requires a firehose check-in process. I had been on the ship less than two months when my phone startled me at 0530 with a call from the special duty officer. He asked if I could take the live EOD Cast and Recovery flight that included the admiral because the original HAC had RM'd out of the flight. I was originally scheduled for a 0930 Plane Guard brief so I told him sure and I would be at the 0630 brief. The Naval Air Training and Operating Procedures Standardization (NATOPS) brief and cast and recovery portions of the brief were conducted with no abnormalities. I stressed our job was to execute in accordance with our NATOPS and the Time-Triggered Protocol (TTP). We anchored on the sea state requirements when to call finish exercise (FINEX), salt encrustation indications, the sequence of events, and contingencies with our on-station search and rescue bird. Everyone knew the plan and just before walking, the XO reminded me to watch my turbine gas temperature (TGT) and torque gauges (TRQ). He stressed that he'd seen this mission put other crews into tight spots. Little did I know his advice would be spot on.

After takeoff, we conducted our standard post takeoff checklist. HITS were Pass/Pass with TGTs reading 682/689 at 60% TRQ, respectively, and the Power Check was 120% TRQ with no Nr droop. Other than seeing some white caps, the weather and sea state of three meant we were a go for the event.

Everyone, including the admiral, was pumped and we proceeded with the first 10ft/5 knot cast off the seven jumpers without incident. We then rolled to downwind at 150ft and 70 knots to set up an inbound turn to execute a ladder recovery at 10ft/0 knots. We spent a little less than 10 minutes in the hover and observed salt spray floating in and around the helicopter. We kept an eye on the TGT and TRQ gauges in the green and normal ranges. After the first recovery was completed, we immediately circled back around for the second iteration and elected to jump the EOD/admiral at 10ft/0 knots; this was done to keep the jumpers in a smaller group, thus making it easier for pickup.

All members began to jump again and while in the hover, we noticed the TGT had some slight surges into the precaution/yellow range. This power surge was directly related to the power adjustments being made to hold a stable hover, given the small altitude adjustments due to the wave action below. We made a quick note of the power, departed the hover and flew into a downwind to set up for recovery of the ladder as briefed.

As we came back around for the pickup and got established in a 10ft hover, the TGTs were still showing slight surges up to 840 C but stabilized out in the green 775 C range. As we departed, we decided to conduct a TGT check at a steady TRQ of 60% and TGT registered in the 710 C range for both engines. We completed a power check, and the aircraft still produced 120% TRQ with no Nr droop, giving us a sense of security that we had plenty of power available to continue the mission.

I took an added lap in the pattern because I was told that the admiral wanted to spend some extra time in the water. With this change to the SOE, my crew and I discussed dropping all the EOD members and admiral in the hover and then doing two iterations for recovery. The plan was to pick up four on the first pass, depart the hover and then come back and pick up the admiral and the last two EOD members on the second pass. We had plenty of gas, concluded this would be easily doable and that we would continue to keep noting TGT in the hover. We executed the 3rd iteration of a cast at a 10ft/0 knot hover and noted no changes in TRQ/TGT from the third iteration. I returned into the hover for recovery, and after the first man up, I noticed a spike of TGT in the red, which coincided with a power bump; the TGT then settled back in the green.

Otherwise, the recovery of the first four EOD members proceeded without issue. We departed, and on downwind, we observe that TGT around 730°C (still green) at 60% TRQ. During the recovery of the last three, the first man up was super quick, then as the last two were on the ladder, I needed a bigger than standard power pull and got a TGT spike above 860°C and it only settled back down into the 830°C range. I confirmed both men were out of the water as I started a slow creep forward.

Once I received the call that the cabin was secure, I departed. We assessed the situation and how that last pickup, we noticed more salt spray and higher TGT spikes. We all agreed that the seas were approaching the limits to conduct the mission safely, and more importantly, the engines had become degraded. We spoke with the SAR bird on the station and relayed that we call FINEX as we started to return to the ship.

Here is what we learned and what should have been discussed in greater detail when briefing Cast and Recovery Operations. In the HSC community we have a plethora of reps and sets in a 70ft hover. However, we don't typically spend much time at 10ft trying to hold a prolonged stable hover in the open ocean. Sea states will cause power surges, making it difficult to determine what our actual relative power is or what possible degradations the aircraft might be experiencing. In a low hover in a sea state of 3-4, the collective will need to be manipulated to ensure a stable platform, which will cause more salt spray than hovering over a zero sea state environment.

In my opinion, the best way to determine your power available is to measure it against a baseline. This should be done by referencing and comparing the HIT TGT numbers while flying at 60% TRQ on downwind. This should be taught as a standard procedure or more proliferated. The average pilot is not afforded much experience in events like SAR jumps or Cast and Recovery. Additionally, I highly recommend determining a TGT No-Go in the RM discussion.

While TGT degradations might start slow, they are not linear in scale. My crew and I should not have attempted the last recovery. We should have had the on-station SAR bird conduct hoist recovery or, better yet, not deployed the jumpers. Despite favorable 15 knot winds, salt encrustation will happen; it is not a matter of "if."


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Recipe for disaster

By LCDR Craig "Provo" Deavours (VFA 204)

• • •

"Our comptuex adversary support was complete and it was time to ferry our three wet configured jets from San Diego to New Orleans. Weather across the country was fantastic and tailwinds were the way I like my coffee - strong! We filed the flight plan and were ready for a benign three-ship flight."

The original plan was to depart Naval Air Station North Island and assess our fuel airborne to see if we could bypass our filed destination of Midland (Texas) International Airport and continue to Naval Air Station Joint Reserve Base Fort Worth instead. However, a 45-minute delay on deck eliminated Fort Worth as an option and we continued to Midland. We climbed to altitude and calculated the flight's low fuel state to be 2,500 pounds at Midland.

We would be 500 pounds over the standard operating procedure for deck fuel on a visual flight rules day-time flight. The weather indicated unrestricted ceiling and visibility at the destination and not a concern. What could go wrong?

Well, allow me to enlighten you. On arrival in Midland, the jet with the lowest fuel state failed to extend its right main landing gear using the standard procedure. Then, it failed to extend using the emergency procedure (EP). Lastly, it was unable to extend during repeated attempts using both methods.

Further complicating matters, the nearest arresting gear field was over 200 miles away, putting the emergency aircraft below divert fuel. A field trip was not an option and we were faced with the nightmare scenario of a pocket checklist-directed landing with only the left main landing gear and nose landing gear extended.

This emergency thoroughly tested our Crew Resource Management (CRM) skills and uncovered our abilities, strengths and weaknesses.

As the flight lead, I immediately landed to read the PCL at zero knots and 1G. Meanwhile, Dash 2 remained airborne with the emergency aircraft as long as possible. This decision proved critical to our success as Dash 2 facilitated a visual inspection of the landing gear and maintained big picture airborne Situational Awareness (SA). After discussing the symmetry of landing on two wing tanks, we decided to jettison the centerline tank to enhance landing rollout controllability. With Dash 2's excellent visual perspective of the tank's likely point of impact, he assertively intervened and stopped the emergency pilot from jettisoning the tank near a field of industrial equipment. Dash 2 steered the jet to a clear field, free of people and structures and the emergency pilot safely jettisoned the centerline tank.

The greatest act of CRM that day was the leadership by all of us not to give up. Despite our backs being against the wall, we were determined to find a safe resolution to the emergency and avert a mishap.

To nobody's surprise, CRM breakdowns did occur and radio communications played a starring role. Communication breaks down in aviation, even during routine operations. When you add in a variety of time-sensitive threats, including a unique and stressful emergency, an unfamiliar field, PCL formatting issues and a low fuel state, it is easy to see how things can pile up to create a recipe for disaster.

We unsuccessfully performed the landing gear unsafe or fails to extend procedure.

The right main landing gear remained stuck in the up position, at which point the PCL guided us to the "Landing Gear Malfunction and Landing Guide" on the following pages.

However, the PCL only references a single page titled "Carrier Landing Malfunction Guide." If you are not familiar enough with this section of the PCL to go directly to the field pages, you will scratch your head for a second before turning the page on your own, which is what I did.

I rushed into the table of malfunctions on the pages without reading the page's title (incorrectly assuming there was only one page of landing gear malfunctions) and started reading from the incorrect malfunction. It quickly became apparent I was on the wrong page when the PCL mentioned the barricade in the absence of a suitable divert, which was not going to happen in Midland.

Good PCL reading is a skill that I took for granted. Don't rush and read the whole page. If there are charts or graphs, don't jump into them immediately before verifying that the page applies.

PCL does not have all the solutions for all the problems. It is written in an environment much different from being in a cockpit. Understanding the difference helps prevent dangerous assumptions from the reader.

After we cleared up the minor confusion over being on the carrier instead of the field landing page, the emergency pilot and I ensured we were on the field recovery pages. Like the carrier pages, these two pages have schematic drawings meant to be general guides to help the pilot correctly identify which line to read. Unfortunately, the emergency pilot misinterpreted the drawings.

The emergency pilot fell prey to expectation bias. His attention was almost immediately drawn to the picture in his mind that matched his malfunction. However, the guidance he read was for a different issue. By reading the notes for the non-applicable malfunction, he incorrectly understood that a full gear-up landing was required.

The drawing that so powerfully captured the emergency pilot's attention shows a jet with the left main landing gear down. In an unfortunate coincidence, this was the down and locked main landing gear on the emergency aircraft. His mind connected the two dots and ignored the rest of the malfunctions on the two pages.

Notably, this schematic does not show the right main landing gear or nose landing gear extended. The malfunction he read is for only one main landing gear (either left or right) down without any other gear extended. The description of no landing gear and one main landing gear up or trailing explains this, but the emergency pilot did not process the text due to understandable stress.

If text describes a picture, read that too. As the book reader, I read from the correct malfunction (on page E28) without knowing that he had been reading from the incorrect malfunction (on page E29). Overly explicit communication in an emergency should not be thought of or perceived as insulting. It can save lives. By providing the page number information, I could have saved the emergency pilot from his mistake.

Expectation bias is real. It is insidious and can easily lead to unrecognized bad SA. The emergency pilot saw a picture that he thought matched his emergency, rushed to read the corresponding procedure and skipped over the textual description because he already was certain that he knew what he was looking at.

This bias resulted in blocking out the content of the book reader's correct information.

U.S.Navy photo by Lance Cpl. Tyler Harmon

U.S.Navy photo by Cpl. Jackson Ricker

At this point, I believed the emergency pilot and I were on the correct page and had reviewed the correct malfunction. Simultaneously, the emergency pilot believed he read and followed along with me on the right page and correct malfunction.

A dangerous trap had been set and snared the two of us. Unrecognized bad SA is the perfect catalyst for dangerously wrong communications.

At this point, the emergency pilot asked me, "So… I'm going to have to do a gear-up landing?" In his mind, he prepared for a belly landing with all of his gear retracted.

The correct procedure and incorrect procedure are almost identical. The correct procedure directs landing with the nose landing gear and left main landing gear extended. The incorrect procedure directs landing with all gear retracted. In other words, both procedures in the PCL recommend the pilot attempt a landing.

I assumed after the carrier recovery page that the confusion was cleared up and both of us referenced the field pages and were indeed referencing the same malfunction. I replied, "Yeah, the PCL doesn't say to do a controlled ejection for this."

I assumed the emergency pilot was referring to landing with only the malfunctioning main landing gear up, not all of his landing gear up. I had just read the notes talking about considerations for landing with one main landing gear and the nose landing gear down and fell prey to the expectation bias. It is impossible to self-assess your own SA and evaluate it as unrecognized bad SA. But, you can almost always assess another person's SA relative to your own. Through precise, effective communication, pilots can confirm matching SA. A disconnect between the two pilots can be resolved back to the correct interpretation of things, but excellent communication is a requisite to this resolution.

There is no room for assumptions and lazy communication in emergency scenarios—accuracy matters. Maintain a questioning attitude. Forcefully back one another up. Be professionally annoying. Read the titles and page numbers aloud. Confirm that the other pilot received and understood your communication. Communicate back to the book reader, so they know you heard what was said.

Dash 2 never left his wingman and was airborne through all of this PCL reading. Because of his coordination with air traffic control on the primary radio, he had turned down the volume on his secondary radio and missed most of the reading. He landed before the emergency aircraft since the runway likely would be fouled after the gear-up landing. Now that he was on deck, he could fully join the conversation.

While burning down to minimum landing fuel, the emergency pilot asked if any of us had any last-minute ideas. The only idea the group came up with was to try additional standard and emergency gear extensions. At that point, there was nothing to lose. The extra attempts to extend the gear continued to be unsuccessful, even after applying positive and negative G. Dash 2 wisely asked, "How much Gs are you putting on the jet?"

The emergency pilot responded, "I'm only able to get about 2.5 Gs because of the NATOPS speed restriction."

Dash 2 replied, "I think you should ignore that restriction. Speed up to whatever you can and pull, see if the extra G does the trick."

Time passed, and finally, the very relieved emergency pilot called out, "All three are down; I've got three down and locked!"

The culprit in this drama was a failed up-lock device. It took the emergency pilot exceeding NATOPS limits and pulling over six Gs to overcome the friction holding the right main landing gear in the retracted position. Dash 2`s suggestion averted a certain Class A mishap.

That single suggestion to try something out of the box was miraculous. Up to that point, we were all fearful that this flight would end in the loss of a jet with the emergency pilot in the unenviable position of a gear-up landing.

CRM led to a dramatic change in the outcome of this flight. Its power is real. Take our experience as evidence the next time you break out your PCL.

A Lesson in CRM and the Importance of ...

"It was a typical October day in South Texas -- mostly sunny with a high of 95. My student and I were scheduled to fly two basic flight maneuver (BFM) flights in the T-45C."

Sound Judgment

LT Robert De Pol and LTJG John Oberstoetter

LTJG Oberstoetter and I had flown a few times together throughout his training and I was fortunate to be his landing signal officer for carrier qualification a few months earlier. The first flight went as briefed and we flew from our home base, Naval Air Station (NAS) Kingsville, to our outlying field, Naval Auxiliary Landing Field (NALF) Orange Grove, to refuel. We spent about 45 minutes at Orange Grove debriefing, grabbing a bite to eat and re-briefing for the second flight of the out and in. The initial portion of the second flight went as planned with a standard takeoff, rendezvous and G warm-up. We began the initial conduct portion of the flight with nothing significant to note. After completing flat scissors, we set up for the next exercise when Oberstoetter and I heard a loud bang in our T-45C, followed by violent vibrations. We were at about 16,000 feet and flying at about 225 knots.

Both of us immediately thought it was a compressor stall. I had experienced a few compressor stalls in the F/A-18 Super Hornet as well as in the T-45C, but never one like this. This was very different and I immediately thought something terrible had happened to the engine. I grabbed the control stick and immediately pointed the aircraft toward NALF Orange Grove, the airfield we had just departed.

We both acknowledged what we thought was a compressor stall over our interphone communication system (ICS), and I transmitted "knock it off" over the radio to let our flight lead know that we were working on an issue.

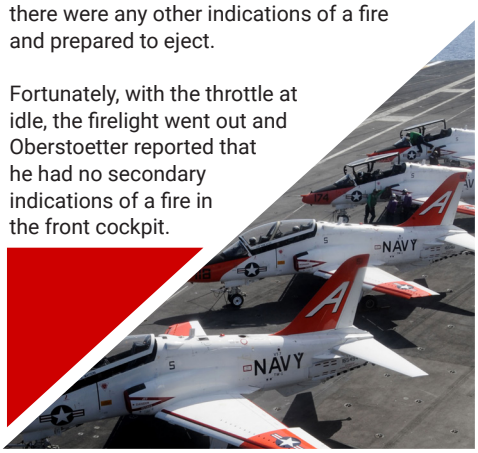
Oberstoetter immediately went through the boldface procedures for a compressor stall as I helped coach him to make sure each step was executed in order. The procedure calls for the throttle to be brought to idle to clear the stall and then monitor the exhaust gas temperature (EGT). If EGT stays above 450 C for more than six seconds, it is indicative of a locked-in compressor stall and the procedure then calls for an air start. We both noted over ICS that EGT was dropping below 450 C and I instructed Oberstoetter to advance the throttle to see if we had any thrust. The increase in throttle did not affect the engine output and our engine core (N2) rpm and EGT continued to fall.

We both acknowledged over ICS that we lost the engine and began going through our air start steps in order. At the time, we had no idea what had caused this engine failure and our lead aircraft was watching a trail of black smoke coming out of our tailpipe as we were descending. I instructed Oberstoetter to intercept our best glide airspeed of 200 knots and pull his emergency oxygen green ring. At this point, I initiated the air start procedure by pulling the throttle off as Oberstoetter followed along and had control of the aircraft.

We were able to restart the engine successfully and all of the gauges seemed to have normal indications. After an engine restart or compressor stall, the Naval Aviation Training and Operating Procedures Standardization Manual (NATOPS) calls for the throttle to be set at the minimum for safe flight. In the T-45C, this is between 78-87% N2 rpm, depending on the precautionary approach (PA) profile required.

As soon as we advanced the throttle off the idle stop, the panel lit up with a master caution and firelight with the associated warning tones. We acknowledged the firelight over ICS and Oberstoetter immediately brought the throttle back to idle. At this time, black and brown smoke was starting to fill the aft cockpit. I directly looked outside and behind us to see if there were any other indications of a fire and prepared to eject.

Fortunately, with the throttle at idle, the firelight went out and Oberstoetter reported that he had no secondary indications of a fire in the front cockpit.



U.S.Navy photo by Petty Officer 3rd Class Erick Kogler

At the same time, we were descending and I could not see NALF Orange Grove from the aft cockpit, even though we were pointed in the correct direction. In the T-45C, as part of the air start procedure, the aircraft automatically secures power to the generator, both multifunction displays and the head-up display (HUD). We were essentially left with emergency backup instrumentation until completing the successful restart procedure.

Fortunately, we were close to NALF Orange Grove, we had plenty of altitude and I had the situational awareness of where we were. Oberstoetter confirmed our position using his laptop and ForeFlight. We soon had NALF Orange Grove in sight at our 10 o'clock position. Oberstoetter also reset the generator and we now had primary aircraft displays back. I was monitoring our airspeed and the aircraft's flight attitude to save energy throughout this entire event. After we got reoriented, we were set up on a high and wide left base leg, returning to the runway we used when we left NALF Orange Grove. I declared an emergency over the guard frequency and informed NALF Orange Grove tower of our situation, requesting an arrested landing.

Although neither the T-45C NATOPS nor the intermediate or advanced jet syllabus covers an idle PA, some instructors still teach it. I routinely instruct students on how to fly a practice idle PA just in case they ever find themselves in this situation and it paid off in this instance.

As Oberstoetter was flying the aircraft on a 15-20° dive profile (5-10° steeper than a standard PA), I dropped the hook and modulated the speed brakes to manage our airspeed. I elected to drop the gear at about 250 knots (25 knots above our NATOPS gear limit) on the base portion of the PA and held off on lowering flaps to manage our energy.

When I felt like we had energy under control, I called for half flaps, again above the flap speed of 225 knots. On the final portion of the PA, I focused on maintaining as much energy as possible. I retracted the speed brakes and had Oberstoetter lower full flaps just as we approached the runway threshold.

Over the runway threshold, he extended the speed brakes and prepared for the roll in engagement to the arresting gear.

I pulled back on the stick to set the arresting hook and successfully caught the wire. We both called for the emergency engine shutdown procedure over the ICS and quickly shut down the engine and disarmed the ejection seats.

U.S.Navy photo by Nathan A Parde

As we egressed the aircraft and ran to the grass at the edge of the runway, we saw smoke billowing out of the tailpipe and intakes and noted that shrapnel had been thrown through the port side of the fuselage near the turbine section of the F405-RR-401 engine. The fire crew was on the scene immediately and sprayed water down both intakes and exhaust. It turned out we had lost the entire low-pressure turbine.

After the event's initial adrenaline rush, we had the rest of the afternoon to absorb what happened as we awaited transportation for medical evaluation at NAS Corpus Christi. As we talked about the flight events and compared thoughts on the 90-minute ride, I told Oberstoetter about the smoke in the rear cockpit. Looking back, I am glad I did not tell him in the air. I decided based on what I saw on the instruments and on being able to look behind us from the back seat. Using sound judgment and the facts at hand, I determined that continuing with the precautionary approach was the most appropriate course of action, given the inherent risk of ejection and possible damage to property and lives on the ground.

Although our engine that day experienced a significant malfunction, many things went right. Our assigned working area was ideal, given its proximity to a suitable emergency landing field. Things could have turned out differently if we were anywhere else in the area or down at pattern altitude.

Oberstoetter and I also worked exceptionally well as a team that day. We used crew resource management (CRM) to our advantage and went through boldface procedures together to ensure the proper steps were followed. Although Oberstoetter flew most of the flight, we each managed different aspects of the recovery. I used the radios to convey our situation to NALB Orange Grove tower, managed the aircraft's energy and configuration and influenced the controls appropriately. Oberstoetter was mainly focused on keeping us on a suitable precautionary approach profile to land and had much better forward visibility to execute the approach and landing.

Emergencies are discussed *ad nauseam* at the end of every brief. We often take this time for granted, as it becomes mundane and routine. This flight cemented in our minds that emergencies are left to the end of the brief for a good reason, as it's the most important part. We further appreciate the importance of knowing emergency procedures cold and having a game plan already in mind before being in a situation. I was lucky to have just completed my semi-annual emergency procedure simulator the month prior. That helped prepare me for this day.

This event cemented for me the importance of incorporating idle PAs into training. Although it is impossible to train for every scenario and replicate the thrust that is coming from a damaged engine, practicing PA's at idle power will give pilots a better feel for the energy management problem with a degraded engine.

Everyone did their part to get us on the ground safely and that made me proud. Our procedures and training paid off. Our flight lead did a fantastic job coordinating air traffic control and letting them know our intentions. He also stayed in the air until we had a successful arrested landing. The controllers kept everyone out of our way and the fire department rolled toward us as we were on approach.

They had a hose on our smoking jet within 30 seconds of us leaving the cockpit. It gives me great pride in working with such professionals and knowing that we can rely on the team to do its part when things go poorly.

EAST CHINA SEA "SMOKELIGHT" APPROACH

By LT Ed "Rhino" Stephens
HSM-49

After completing four months of Enforcement Coordination Cell (ECC) Operations embarked aboard USS RAFAEL PERALTA (DDG-115) in the East China Sea, things started to get repetitive and predictable. Each flight would take off, find any vessels of interest and report findings to shipboard personnel to coordinate further action. The routine had set in and everyone was essentially operating on autopilot.

Upon departing Sasebo, Japan, after a brief port call on the pier, we headed back to the East China Sea to continue with the same ECC tasking. This time we were positioned farther north in more unusual and unpredictable weather. Each morning the first crew would walk on the flight deck to observe weather barely meeting our Standard Operating Procedure minimums – 500-foot ceilings and one-mile visibility. Several times we would return for landing shortly after launch due to weather below minimums. The environmental conditions were patchy.

About a week into dealing with these less than ideal operating conditions, we began moving south for a Replenishment-at-Sea (RAS), where the weather was reported to be much better. Two days after our south-bound course change, I was scheduled for the first flight. I looked forward to getting back in the air after multiple cancellations. A half-hour before my brief, I walked on the flight deck and observed unrestricted ceilings and greater than seven miles of visibility. Satisfied with the weather, I optimistically headed to the Combat Information Center to meet up with my crew to receive our daily taskings. My co-pilot, LT Tom Goodell, and Aircrewman, AWR2 Christian Keyes, were waiting when I walked in the room.

After a brief update of our upcoming flight with our controller, we headed to our designated crew briefing space for our Risk Management discussion and Naval Air Training and Operating Procedures Standardization (NATOPS) brief.

Before each flight, we asked ourselves, "What is different today?" The weather was the primary topic of discussion. We briefed the standard stuff – If the weather gets bad, we'll return to base, shoot an approach, swap controls at the Minimum Descent Altitude (MDA) and land. No big deal.

After our pre-flight inspection, we strapped in for our normal start-up checks. The Landing Signal Officer (LSO) passed us "the numbers" - Foxtrot Corpen was 180 at 13 knots and the winds were 180 at 15 knots. We were looking forward to breaking deck for a full flight. "Beams open, green deck, lift" and we were off.

We checked in with our controller and told him that we were heading south down the ship's planned course to get a better look at the weather.

After the previous week's run, I wanted to play it safe. No more than five miles into our transit, we saw the wall of fog that was deeper than any of us could see. This was where things started to get complicated.

"Control, Red Stinger 22. Request flight quarters for recovery, weather is pretty bad off the nose and the ship is driving right into it." Our controller responded, "Red Stinger 22 stand by; we'll call flight quarters right now." We headed back to the ship for what we thought would be a routine recovery. Before they set flight quarters, it was too late. The ship was in the middle of the fog and we couldn't see anything.

U.S.Navy photo by Mass Communication Specialist 2nd Class Jason Isaacs

We had only been flying for 20 minutes but realized windows would start closing if we wasted all of our fuel waiting on the ship to turn around. We established a bingo fuel to Muan International Airport in South Korea, about 110 miles away. The 2,100-pound bingo gave us a little over an hour and 30 minutes to attempt a recovery on the flight deck that was inconveniently located in the layer of fog. Satisfied with our safe divert option, we began to plot the weather on our mission display by outlining the area of better weather and coordinating with the ship.

The aircraft had 3,800 pounds of fuel, enough to remain aloft for nearly three and a half hours at our maximum conservation airspeed. However, 400 pounds of fuel remained in our auxiliary fuel tank. To verify that we were not overestimating our fuel state, we initiated a manual fuel transfer from the auxiliary fuel tank. We observed a transfer of 100 pounds of fuel before receiving an "Auto Fuel Transfer Fault" caution light. The remaining 300 pounds of fuel equated to roughly 15-20 minutes of flight time that would be unavailable if we could not get the system to function properly. I passed the controls to Goodell and pulled out our checklist; we went through the emergency procedure and restored the auxiliary fuel tank's functionality. This small victory played a significant role later in the flight.

Our ship had turned to a northerly course at the half-hour mark of our flight but decreased their speed to 13 knots due to the low visibility. Goodell quickly explained the ship would need to increase its speed to greater than 18 knots if they were going to outrun the fog. Mother Nature had full control of the distance variable in the time, speed and distance problem we were trying to solve. If the ship could not find better weather, we would have to decide between taking a U.S. Navy Helicopter into a foreign country with classified material during a global pandemic or attempting an emergency procedure to recover in weather below instrument minimums.

With this in mind, and fuel continuing to burn down to our divert bingo, we headed back to the ship for our first round of multiple practice approaches to assess an approach's feasibility. En-route we discussed our game plan for conducting our recovery. The first approach would be a typical TACAN approach profile stern of the ship. If we did not have the ship in sight at one-half mile, we would wave off. During the second approach, we would descend 25 feet and initiate a wave off at 0.4 nm. We reviewed and expanded on what we discussed in our NATOPS brief: I would fly the approach and maintain an instrument scan, Goodell would maintain an 80% external scan and back me up on the instruments the other 20%. Our Aircrewman, AWR2 Keyes, would call out closure rates to maintain the desired approach parameters.

Additionally, AWR2 Keyes was operating our Forward Looking Infrared System to acquire the ship using an infrared camera to add to our situational awareness. The plan was to visually receive the ship's wake during the approach and use it to guide us to the flight deck. Once Goodell had the ship in sight, I would pass him controls and he would bring the aircraft in while I maintained an instrument scan and wave off posture. Those attempted approaches confirmed what we already knew. The visibility was terrible and it would not get better until the ship broke out of the fog. We were running out of time.

We descended to observe the conditions in which we were going to have to attempt to recover. The observed ceiling was less than 200-feet and visibility was less than half a mile. We no longer had the weather minimums to shoot the Tactical Air Navigation System (TACAN) approach.

As the crew discussed our options, we realized we had a very small window of opportunity to make a recovery in the conditions from which we launched. When we launched, the ship was headed south at 13 knots but had increased to 20 knots to cover more ground.

Our newly discovered wall of fog was moving from south to north at about 10-15 knots. We decided to return to better weather to observe the conditions and further evaluate our options.

The aircraft had 3,800 pounds of fuel, enough to remain aloft for nearly three and a half hours at our maximum conservation airspeed.

We decided to climb back out of the weather and reevaluate our fuel state and the ship's distance to our desired area of better weather. One hour and 10 minutes remained until our divert bingo fuel. The fog layer was moving so quickly that the ship was now 10 miles from clear weather. To find clear weather before our bingo fuel, the ship would have to increase speed to 28 knots – not an easy task in visibility below half a mile. After ensuring clearance from surface contact, the ship increased speed to attempt to escape the fog.

However, it looked less and less likely that we would have the fuel to wait for the ship to reach the weather above approach mins.

Fortunately for us, the remaining detachment pilots were working on the problem aboard the ship. We received a radio call from our air boss, Lt. Cmdr. Greg Lewis. We discussed with air boss, the risks of attempting a "smokelight" type of approach profile stern of the ship. This would be our best chance for a shipboard recovery before reaching our bingo fuel. LT Eric Torres was also communicating with us on our Land or Launch frequency and had been coordinating with the ship for the past hour.

A smokelight approach is an emergency procedure used in low visibility where the aircraft is positioned two miles astern of the ship and proceeds inbound. The aircraft descends at the pilot's discretion to an altitude of 40 feet and 40 knots during the final approach profile. The intent is to visually acquire the ship's wake using smoke markers if required, which would be dropped at a predetermined interval. This visual aid, combined with our instruments, allows the pilots to acquire the ship to recover the aircraft visually safely. In our case, we elected to forego smoke markers because it was daytime and to avoid any additional reduction of visibility.

Besides studying this approach during my Helicopter Aircraft Commander (HAC) syllabus and thinking through scenarios during which it would be used, I had no additional exposure to this procedure. During my five years flying in the Navy, I have never heard someone utilizing this procedure, but it was our best shot at recovery.

On the way back to the ship, I had a brief discussion with the crew to ensure all questions were answered and assigned responsibilities before attempting this emergency recovery. Goodell is a sharp guy who is at the terminal stages of his HAC training and fully understood what was about to happen. Keyes jokingly responded to our discussion with, "Sure, you guys do what you have to do, but sushi in South Korea sounds pretty nice." At that point, I was shocked, not because Keyes was joking about sushi,

U.S.Navy photo by Mass Communication Specialist 2nd Class Jason Isaacs

but because these guys were just as calm as they would have been if we were flying any normal flight, ready to execute. We positioned the aircraft four miles astern the ship. Our fuel state was 2,400 pounds, about 15-20 minutes until our divert bingo fuel state. We coordinated with air boss to have the ship maintain a speed of 27 knots to ensure the wake was easily visible. Once we were close enough, the ship would slow to 20 knots to avoid the "squatting" effect and large wake that happens when a DDG uses higher speeds. We established an instrument scan and initiated our descent from 500 feet to 40 feet.

Instrument meteorological conditions (IMC) were encountered down to 100 feet. I continued to descend to 70 feet to mitigate the risk of reentering the clouds and elected to stay above 40 feet to mitigate the risk of controlled flight into terrain if we experienced vertigo or disorientation. Maintaining an instrument scan, I flew the 70 feet and 40-knot profile. Goodell was able to acquire the wake three miles away from the ship. He provided more accurate guidance than the TACAN by giving me "start turn" and "stop turn" calls just like a controller giving a non-gyro precision approach. That allowed us to maintain our position over the ship's wake. Once we had the wake, the ship slowed to 20 knots and Torres passed us the numbers and Green Deck for recovery. Those final three miles felt like we were flying for 30 minutes.

Goodell visually acquired the ship at 0.3 nautical miles. I maintained the instrument scan and wave off posture while passing him the controls. He landed the aircraft safely and we took a huge sigh of relief. I turned to Goodell and asked jokingly, "So… what do you think about a two-for-two?"; the whole crew laughed nervously, drenched in sweat, as we each internalized what had just happened. The Air boss, Torres and the rest of the pilots greeted us after we shut down. We took that opportunity to discuss what happened, lessons learned and what could have been done to prevent a similar future situation.

Unfortunately, weather can be unpredictable and conditions below minimums can come on unexpectedly. It's important to ensure that all parties have discussed these types of scenarios in advance and are agreed on the importance of avoiding the circumstances that require using an emergency procedure. This procedure requires clear communication and an understanding of how to respond. One of the most useful take-aways is ensuring we don't take those seldom-employed emergency procedures for granted.

Our familiarity with the smokelight approach was the key to our successful recovery, even though we rarely practice it or have to use it. It was also critical to know that we were not alone in situations like these; we had air boss, Torres and the rest of the ship working hard to help get us on the deck safely.

Finally, it's essential to think outside the box. The idea to have the ship stay at high speed and then slow down while we were on final is not a standard procedure. However, in this case, the wake was much more visible and easier to find when the ship was doing 27 knots vice 20 knots and allowed us to find the ship visually.

While the situation was challenging and took a strong collective effort, each detachment member took away many valuable lessons. I was incredibly proud of my crew, who remained calm and focused throughout what ended up being the longest two-hour flight of my life.

While as pilots we never hope to find ourselves in such conditions, experiences like this allow us to build our wealth of knowledge and improve as a community.

Mitigating our Repositioning Flight during COVID-19 with Deliberate RM

VQ-1 maintains a constant presence 365 days a year across three Area of Operations employing the EP-3E Aries II aircraft. As such, this permanence requires the constant rotation or "repositioning" of our aircraft and crews in and out of the theater to maintain proper aircraft maintenance standards, as well as requisite crew endurance and sustainability. This performance is typically done at an ops tempo of every three months or so, depending upon normal crew rotations and aircraft maintenance cycles.

During these times, as we are all well aware, the DoD, U.S. Navy and theater commanders have prudently put forth certain restrictions and additional protective measures upon movements worldwide.

While necessary to ensure Navy personnel and surrounding communities' safety from the further spread of COVID-19 and maximize the efficacy of forces under such restraints, these measures naturally imposed some peculiarities upon our standard repositioning of aircraft. That being said, these additional challenges to standard REPO planning did not appreciably hinder or preclude our ability to transfer our aircraft. However, they did require our crew to incorporate proactive RM measures in our planning and execution phases. This article will highlight some of these additional measures required of our crews in the REPO of aircraft during these COVID-19 restrictions, as well as some lessons learned along the way.

By: LT Jameson Pirkle

U.S.Navy photo by Petty Officer 3rd Class Conner Blake

U.S. Navy photo by Mass Communication Specialist 3rd Class Andrew Langholf

My particular experience with a REPO during COVID-19 was planning a trip for one aircraft and a crew of 10 from Kadena Air Base, Japan back home to NAS Whidbey Island, Washington. Our flightplan took us from Kadena on Okinawa Japan (RODN), north to Misawa, which is situated on mainland Japan (RJSM) and then on to Elmendorf Air Force Base, Alaska (PAED) for gas before finally landing onboard NAS Whidbey Island (KNUW).

Proposed Route: RODN -> RJSM -> PAED -> KNUW. Total travel time: two days.

When crossing the Pacific Ocean, REPO's of EP-3 aircraft typically travel north along the route just described or south through Hawaii, Wake Island or Kwajelein, Guam, Kadena and vice versa. EP-3's can carry up to 60,000 lbs. of fuel and typically fly around seven to nine hours comfortably, with 10 hours of flight time being around the normal limit of our capabilities. When choosing to travel south or north, we consider the effect of winds aloft, leg distance and fuel availability along our route. Being a prop-driven, pressurized aircraft capable of maximum altitudes nearing 25,000 feet and top speeds of 340 knots, we carefully weigh the benefits of flying south or north depending upon the seasons and prevailing winds. The preceding information is meant to provide insight into our first complication with REPO-ing during COVID-19: picking a route that minimizes stay time in the country to country flights.

Keeping the two-week restriction of movement when transiting from nation to nation in mind, we wanted to choose a route that would minimize the number of stops we'd have to make along the flight route. If our aircraft broke down at a site or required something longer than a quick maintenance fix, to be compliant with the instructions, we risked being stuck for up to 14 days at a base with potentially no support for our aircraft or even lodging that meets the ROM requirements. Should we become stuck on a Southern island, maintenance support and parts are only available to be flown in from Kadena or Whidbey Island. Our aircraft (50 years old or so) means replacement parts and qualified personnel worldwide are limited.

The current COVID instructions allowed us to go straight from the aircraft to our hotel room and then back to the aircraft; this would allow us to fly the next day again. However, should anyone violate this policy, they run the risk of being stuck for two weeks at that location, confined to their quarters. We had crew rest to think about in transit. Sure, we could grab gas and take off at every site along the way until reaching Whidbey but that was not an option. CNAF instruction 3710 stipulates an aircrew "…shall not be scheduled for continuous alert and flight duty (required awake) in excess of 18 hours". Flying an aircraft with a dubious autopilot system, we at VQ are very much behind this policy.

A southern route at our typical max airspeed at altitude would run around 20 or so hours of just flight time. This does not include time spent stopping at the field and waiting for a gas truck to come or maintenance service if needed. Typical refueling times can take anywhere from 15-30 minutes if we are loading up to max. While taking the southern route across the Pacific is usually preferred due to the greater number of diverts for weather and maintenance, coupled with the superfluous but preferable gorgeous vistas and accommodations, the prospect of any crew member being perhaps confined for 14 days swayed our choice to the North.

North was fortuitous for our planning, as we were looking at an 8.5 hour transit time across the Pacific.

Therefore, we could more comfortably take off from RJSM, get gas at PAED and from there conduct a four-hour flight down to KNUW, making it a lengthy but doable 13-14 hour day of flying. By going north, we minimized the potential for staying in quarantine for an extended period of time.

The next additional consideration for travel was ensuring we complied with any and all COVID safety practices at the airfields we were passing through. This consideration was perhaps the most challenging aspect of our flight planning because of the potential for quite varied practices base-to-base, case-by-case. There are delineated courses of action within multiple guidelines and instructions for particular scenarios such as ROM, general GFM movements and bubble-to-bubble transfers. What was not clearly defined for us was if a particular command or location was considered a bubble or not. As such, we didn't know the exact rules for staying in a hotel on base as we transited.

Or say we had to divert or stay at the gas and go location due to maintenance. Of concern for us during each stop was whether we'd need to be swabbed for testing, detained or kept isolated at our aircraft and then forced to vacate the airfield. We weren't sure what each command had detailed for combating COVID spread since the bases we transited through were Air Force-run and located in different theaters while we traveled across the globe. Each theater and local COVID policy usually carried a caveat for various policies within the documents. We were curious about whether or not we'd have the freedom to move around the base to grab supplies for the following day's flight wherever we traveled or even if we'd have to be confined to quarters.

"FLEET, TYCOM AND OPERATIONAL COMMANDERS MAY ISSUE MORE SPECIFIC GUIDANCE TO UNITS WITHIN THEIR RESPECTIVE AREAS OF RESPONSIBILITY."

After reading the instructions, we considered ourselves to be within a "bubble," and in traveling from Kadena to Misawa, were conducting a "bubble-to-bubble transfer" as defined by NAVADMIN 155/20 and CPF/C7F guidance, with the justification authorizing our repositioning being "global force management" under NAVADMIN 116/20. What was not readily apparent to us from the instruction was our planned gas and go in Elmendorf, Alaska.

As with most things in the Navy, instructions are the right starting spot for any task, but making a call was the only way to get down to facts. Calling in advance to each airfield's base operations allowed us to get an accurate idea of what to expect when we arrived at each base. Thankfully we didn't encounter much inconvenience here. Because we were moving from a Japanese air base to another Japanese air base, Misawa allowed our crew to move around within the confines of their installation, provided we limited contact with others when doing so.

We could not leave the base, but that was fine with us. As well, Misawa COVID screening was quick and painless. After taxiing to a stop with our aircraft, we departed with masks and met personnel awaiting us on the flight line. They had us fill out a brief COVID screening questionnaire comprised of several yes or no questions about potential COVID exposure. Then they took our temperature with an IR thermometer and we were good to go.

Elmendorf airfield presented no complications because our crew stayed inside the aircraft while our flight engineers refueled. However, we did have to de-conflict in advance with our landing times. Due to COVID practices, most airfields had reduced manning and hours of operation. Initially, we had planned on landing during their reported open times according to current NOTAMs.

After calling Elmendorf base ops, we changed this to our original time of 0200.

This aligned better with our flight route and they did have personnel standing by for us to get fuel.

And although we did not need it since it was a gas and go, we checked if a hotel on base would have been available if needed.

We were informed a hotel and rooms were available, but we were required to do nothing but travel from the flight line direct to our rooms and back. We'd be confined there for the night and the following morning would be transported directly back to our aircraft.

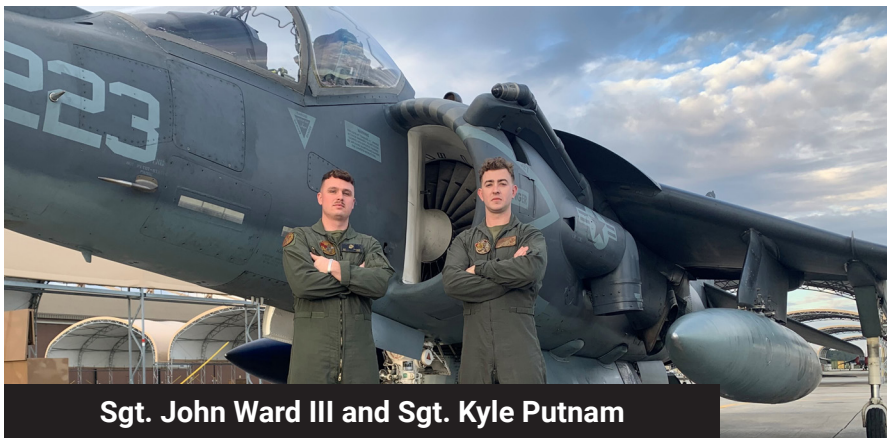
Thankfully, we didn't need to do this, but it was comforting to have it as a backup. After getting gas in PAED, we took off early in the morning and finally arrived at KNUW four hours later. After unloading our travel bags, we locked up the aircraft leaving only required equipment on board. Current maintenance practices dictate leaving the aircraft isolated then deep cleaning it before returning the aircraft to service. We left the flight line, went straight to our vehicles and retired to our respective living quarters for two weeks of COVID ROM. This was the weirdest homecoming by far after an extended deployment.

Overall the REPO was thankfully uneventful for us. It was sometimes confusing navigating through the overwhelming amount of guidance, directives, OCONUS and CONUS documents trying to find precisely what permitted our movements and how they were to be conducted. But we alleviated most of this confusion by contacting base ops directly at airfields we were stopping at. Further complications occasionally arose because commands changed their policies during the weeks leading up to our planning.

At one point, a few weeks before our flight, we were informed we had to do a COVID test before leaving Kadena, upon arrival to Misawa and then again a third time when arriving in Whidbey.

(Thankfully, we ended up not needing to do these tests and ROM just at Whidbey before being allowed back to work.)

The continually changing guidance and practices kept us on our toes, to say the least. In the end, using deliberate RM and a conservative approach, we were able to get back home with little to no obstructions to our planned REPO and any inconveniences were mild at best and quickly handled through nothing more than a phone call.



Sgt. John Ward III and Sgt. Kyle Putnam

While conducting a functional check flight, the test pilot experienced binding flight controls when applying pressure to the right pedal. The pilot debriefed quality assurance that the binding felt like 10-15 pounds of extra pressure to operate the right rudder pedal. During troubleshooting, dayshift airframes mechanics moved the rudder by hand and manually felt the friction point.

NATEC Fleet Support representatives aided in correctly diagnosing faulty spring cartridge in the aircraft's nose. Once the installation of the new spring cartridge was completed by nightshift airframes collateral duty quality assurance representatives, Sergeants' Putnam and Ward, the binding in the rudder was still present. Both sergeants continued to troubleshoot to find additional discrepancies.

After several hours of troubleshooting, they discovered that the rudder flight control cable was frayed at a pulley aft of frame 38, near the aircraft's tail.

Locating the frayed portion of the cable was difficult because it was concealed behind the On-Board Oxygen Generation System (OBOGS) concentrator inside panel 61. Upon a closer examination of the immediate area, a rivet buck tail that had been drilled out in a previous repair was found entrapped in the grease lubricating the channel of the aft pulley that the cable ran through. The rudder flight control cable had been chaffing against the rivet whenever the rudder pedals were actuated. This discrepancy already caused significant damage to the cable and over time would have caused the rudder flight control cable to break, resulting in a catastrophic event leading to potential loss of aircraft and possible injury to the pilot.

Due to sound maintenance practices, extensive troubleshooting and attention to detail, Sergeants' Putnam and Ward identified and corrected a complex, non-standard malfunction within a flight control system and prevented the potential loss of an aircraft and injury to aircrew.

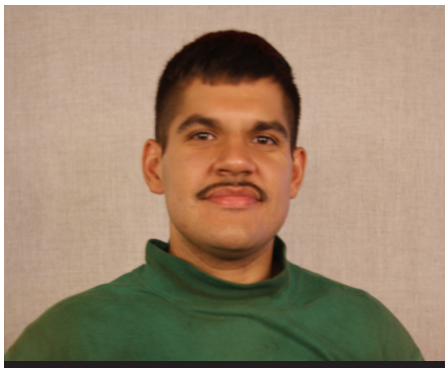
AE3 Spahr

Congratulations to AE3 Jonathan Spahr's on his selection as a Commander, Patrol and Reconnaissance Group "Safety Pro" for exceptional professionalism while attached to Patrol Squadron TWO-SIX. AE3 Spahr's steadfast awareness and overall vigilance broke a chain of events that may have led to a mishap and ensured continued safe squadron operations without injury. During a pre-flight on Aircraft 168859, he found a first aid kit that had been opened and used. He quickly notified maintenance control and had the PRs re-supply the first aid kit, preventing a lost flight due to a downing discrepancy.

His outstanding performance has justly earned his shipmates' admiration and respect and is in keeping with the highest traditions of the United States Naval Service.

AM1 Jason Lennen

AM1 Lennen has many responsibilities as an LPO, but this didn't stop him from paying close attention to the material condition of his squadron's spaces. AM1 noted a missing fire protective coating on the main hangar structure, a deficiency that could result in catastrophic structural degradation during a fire. He promptly passed this information up the chain of command to ensure his squadron's spaces are left better and safer than when the squadron assumed them. AM1 Lennen was awarded the Commander, Patrol and Reconnaissance Group Safety Pro Award for his actions.



AD3 Sterling A. Infante

During a crew swap at Naval Base Ventura County, Point Mugu, AD3 Infante noticed a gouge in the starboard main landing gear of an E-2C Hawkeye. He notified the aircraft captain to call over the Airframes CDI to down the tire. The aircraft was scheduled to fly a field carrier landing practice (FCLP) mission, which involves the aircraft making repeated landings at a higher descent rate than is typical for a field landing.

Thanks to AD3 Infante's attention to detail, a safety risk to aircrew and aircraft was mitigated. AD3 Infante was awarded Safety Sailor of the Quarter for his actions.

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