THE NAVY AND MARINE CORPS AVIATION SAFETY MAGAZINE

Approach

VOL. 66, NO. 1

Windshield Vs. Vulture

Impact at 240 KCAS

MORALE IS IMPORTANT

ASK QUESTIONS FIND SOLUTIONS

+ MORE

Aviation Safety Team

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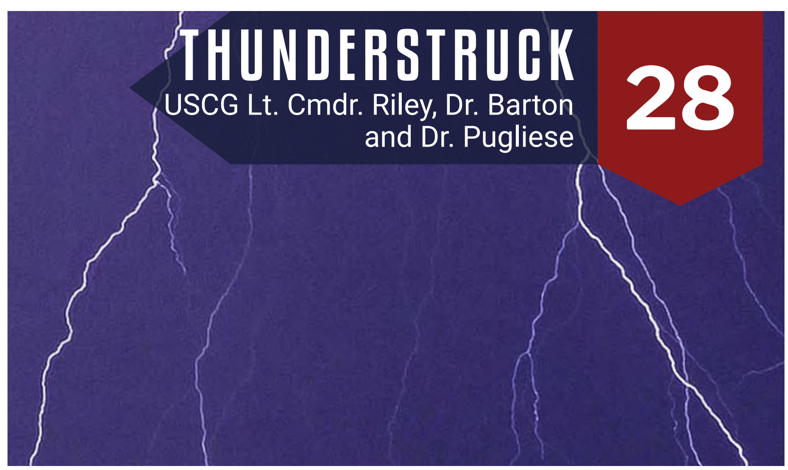


Stay Connected

Commander, Naval Safety Command

Naval Aviators,

I have recently assumed the duty as Commander, Naval Safety Command and I am excited about working with this team of military and civilian safety professionals. I am a career FA-18 pilot and have been fortunate to command at the squadron, CAG and Carrier Strike Group level. I know first-hand the value and importance of maintaining risk awareness and embodying the tenets of risk identification and crew resource management. I have a thorough appreciation for the resources and tools that the Safety Command has provided to the Naval Aviation Enterprise.

Safe operations equal effective operations. My commitment is to provide a robust foundation in data analytics, risk assurance and safety policy. I am confident that NAVSAFECOM will remain your one-stop shop for building and maintaining the safety culture within our Navy and Marine Corps aviation organizations.

Safety Command provides myriad resources and *Approach* Magazine is just one of them. I encourage you to regularly check the information on our website and our mobile app. Safety in aviation is our primary importance so that we can execute the mission. We appreciate and welcome your feedback and input on how we can improve as a team.

Speed n Angels Left,

RADM Dan "Dino" Martin, USN

P8's Limiting Factor

By Naval Aircrewmen First Class Matthew Beaty

PATROL SQUADRON (VP) 26
THE TRIDENTS

The P-8A Poseidon is the Navy's newest and most advanced addition to its Maritime Patrol and Reconnaissance Force (MPRF). A modified Boeing 737, the P-8A is equipped with an advanced array of airborne electronic and acoustic sensor suites capable of performing anti-submarine (ASW) and anti-surface warfare (ASUW), intelligence, surveillance and reconnaissance (ISR) operations and maritime search and rescue (SAR) operations worldwide. Established as the spearhead of airborne reconnaissance and as platform capabilities continue progressing, the need and risks associated with the P-8A become far greater.

Capable of higher ceiling altitudes, faster transit speeds and an increased fuel capacity, the P-8A is designed to operate farther, arrive on-station faster and stay out longer than its predecessor, the P-3C Orion. With recently added air-to-air refueling capabilities and the ability to refuel multiple times, the platform is able to further extend operational ranges and overall flight duration to complete the mission at hand, limited primarily by engine oil consumption. Although the aircraft capabilities continue to grow and new hardware and software iterations are incorporated, human limitations remain the same.

As median flight durations increase to fill intelligence gaps and maintain a persistent presence within an area of responsibility, operational safety becomes a major concern for plane commanders and mission crews. A lack of sleep driven by an inconsistent and ever-changing schedule demanded by operational necessity is an constant factor for P-8A crews. With irregular sleep patterns and extended flight profiles, fatigue is heavily weighted in flight planning and the overall safety of flight evolutions. Fatigue may result in slowed reflexes and responses, impaired decision-making and judgment, poor concentration and a reduced ability to pay attention to the situation at hand; all things required of a naval aviator. All factors considered, naval aviation is keen on correcting deficiencies and mitigating risks of mishap to the maximum extent possible through the use of risk management (RM).

Risk management is the process of identifying hazards that may be encountered during evolutions, assessing identified hazards for perceived severity, making risk decisions to accomplish the mission whilst returning aircraft safely on deck, implementing controls to prevent mishaps and supervising the implementation of those controls and the proper training of personnel. Flight evolutions require the use of a RM matrix to establish the perceived level of risk associated with each flight evolution and fatigue as well as flight duration hold positions on this matrix, further stressing the impact improving capabilities will have on flight crews. Although safety concerns continue to rise as the MPRF community evolves, proper use of the RM process by accurately perceiving the severity of risks and implementing the appropriate level of controls will allow P-8A crews to continue operating safely.

FUTURE MARITIME DOMAIN

THE GREAT POWER COMPETITION ERA

By Lt. Joshua Christian

HELICOPTER MARITIME STRIKE SQUADRON (HSM) 48
THE VIPERS

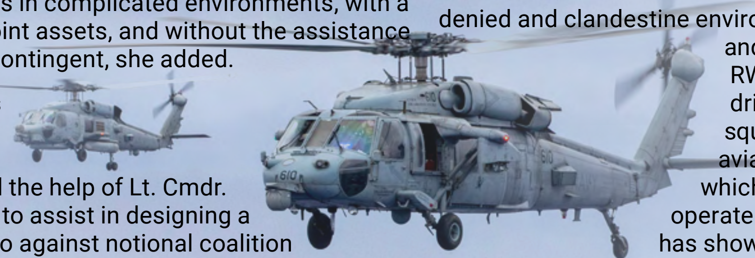
In July 2023, HSM-48 designated the community's first Maritime Strike Rotary Wing Expeditionary Mission Commander (MSRWEMC). Lt. Cmdr. Brittany Collins planned and executed three operational-level warfighting scenarios, along with assets from CPRW-10, CPRW-11, HSM-50, HSM-40, HSM-37 and Navy Aviation Distributed Training Center PAC (NADTC Pacific) in a Distributed Maritime Operations (DMO) environment focused on offensive anti-submarine warfare (ASW) and expeditionary advance base operations (EABO). The Commander, Helicopter Maritime Strike Wing Atlantic (CHSMWL) Maritime Strike Rotary Wing Mission Commander (RWMC) Program was created to mentor and develop expeditionary department head level officers and their enlisted sensor operators to lead in the high-end fight from austere locations and aside from traditional fleet training and readiness models.

The MSRWEMC syllabus is a program carrier-based MH-60R squadrons have successfully implemented for years, developing planning guidelines and complex Maritime Strike scenarios. However, these scenarios are heavily influenced by carrier-based assets, aircraft and surface warfare platforms that have limited availability to the expeditionary squadrons. "In my experience at HSM-51 and HSM-48, we deploy on cruisers, destroyers and now littoral combat ships, often with no carrier support. Based on current warfighting doctrines, it is not unrealistic to anticipate a requirement to fight without big deck support. With EABO warfighting development, we needed a syllabus that helps us develop tactics to support the new DMO Environment, with the assets we would have available to us, said Collins. "While Naval Aviation Warfare Development Command (NAWDC) and MH-60R weapons schools tailor their syllabus to expeditionary environments for Air Combat Training Continuum (ACTC) tactical qualifications, most of the operational level planning is provided as part of the planning documents. We needed to develop mission commanders that can plan and lead a large-scale operation, above the tactical level, with our available assets." It's not just about executing the tactics anymore but developing and implementing integrated power-projection operations in complicated environments, with a small force of Naval and Joint assets, and without the assistance of the CVN and their staff contingent, she added.

To ensure the scenario was relevant to current force laydowns and warfighting techniques, Collins enlisted the help of Lt. Cmdr. Tim Cadigan from HSM-50 to assist in designing a Homeland Defense scenario against notional coalition adversaries, including subsurface, surface and enemy air combatants. The scenario used the current force laydown and enemy order of battles and was designed to be as realistic as possible. Cadigan also developed scenarios that are currently utilized at the Fleet Replacement Squadron (FRS) to teach tactics to FRPs; one such scenario involved the employment of precision guided munitions (PGM) in response to violent extremist group small boat harassment of vessels in the Red Sea. This scenario came to fruition in December 2023 and the MH-60R crews involved were prepared due to the scenario-based training completed at the FRS. Cadigan emphasized the importance of developing scenarios relevant to the current geopolitical environment and threats faced by various fleet locations. He further explains that the scenarios that the FRS, weapon school and individual squadrons utilize to train and develop the tactics employed by MH-60R aircrew and pilots need to be modeled to face current geopolitical threats. Through the alteration of scenarios, aircrew will be better trained to fight the current threats that each fleet location will face.

Collins' RWMC scenario was something the expeditionary team had not trained in before, and it created unique challenges in the planning environment. While the ACTC syllabus groom's pilots in tactics, operational-level planning requires candidates to step back, view the bigger picture and direct the movement and logistics of assets outside the immediate MH-60R community. "Mission Commander University, hosted by NAWDC, as a part of Air Wing Fallon, gave me general guidelines on how to organize the planning teams, but ultimately, I had to fall back on the joint planning process and my operational planning team lead experience I gained from [Commander, Third Fleet]," Collins said. "In an expeditionary environment, mission commanders may not have the connectivity we rely on at home or on a carrier to stand up a team and develop complicated tactical plans. If I'm on a ship but coordinating assets are on an EAB, I may not be able to reach out quickly or at all. This program teaches expeditionary RWMCs to plan around the lack of connectivity. You have to be knowledgeable enough on assets to coordinate with them when your only options available for planning are email, chat or formal orders."

In our era of great power competition, where technological advancements and strategic innovation are paramount, the emergence of Collins as the first RWMC heralds a new chapter in military leadership. She recognizes the importance of operational planning. "As we immerse ourselves in these complex multi-mission events, we can prevent stagnation, evolve our tactics and emerge as more skilled and effective warfighters," she said. The RWMC course will enable leaders within the expeditionary community to develop the tactics and procedures necessary to respond to future enemy order of battles. Cadigan points to a future where the force must be prepared to operate in a GPS denied and clandestine environment requiring careful planning and execution of battle plans. The RWMC will be able to encourage and drive scenarios at the individual squadron level to instruct and train aviators in integrated joint operations, which enable the force to effectively operate in any region. Recent history has shown the importance of developing officers and creating scenarios that are relevant to where Naval Forces operate as well as anticipating new threats and geographic tactical gaps. This is the spirit of the CHSMWL Maritime Strike Rotary Wing Mission Commander Program.



An MH-60R Sea Hawk helicopter assigned to Helicopter Maritime Strike Squadron (HSM) 71, left, and an MH-60S Sea Hawk helicopter, assigned to Helicopter Sea Combat Squadron (HSC) 14, conduct flight operations from the Nimitz-class aircraft carrier USS Abraham Lincoln (CVN 72). (U.S. Navy photo by Mass Communication Specialist 1st Class Jerome D. Johnson)

PE CORNER

BRAIN WAVES AND AI

THE FUTURE OF PHYSIOLOGIC MONITORING IN MILITARY AVIATION.

By Navy Capt. Merrill Rice

PHYSIOLOGICAL EPISODES ACTION TEAM *(PEAT)*

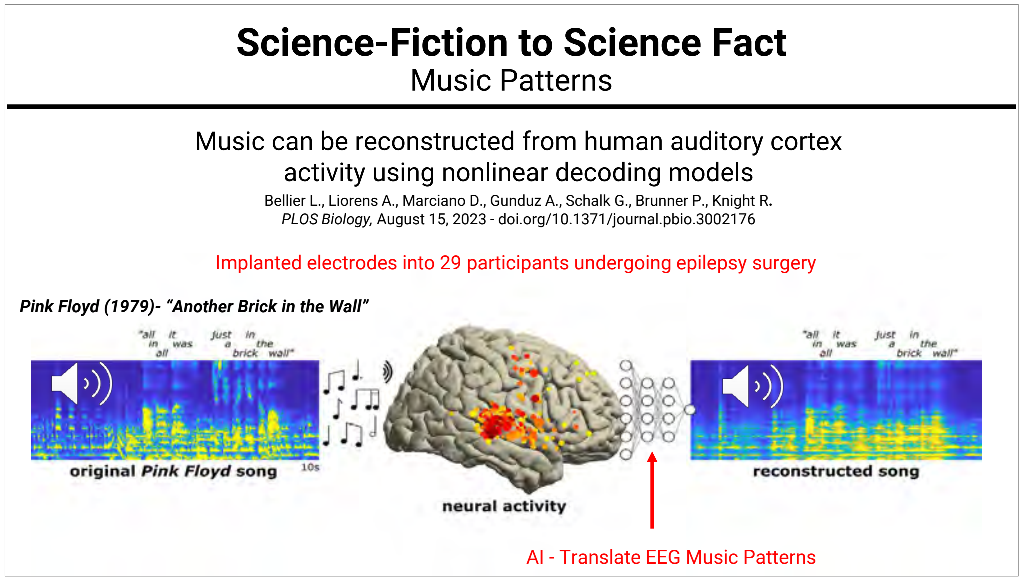


Figure 1. Bellier et al. (2023) uses AI algorithms to decode auditory stimuli and reproduce "Another Brick in Wall".

The Cold War military action thriller, *FireFox* (1982), starring Clint Eastwood as a retired Air Force major test pilot recruited to steal the mythical Russian MiG 38. The MiG 38 has advanced technology incorporated into the pilot's helmet that allows the pilot to convert their thoughts into action. The only problem for Maj. Mitchell Gant (Eastwood) is he must think in Russian. Fortunately, he was recruited based on both his language and flight ability. In the movie's climax, where his plan is discovered and he is being chased by two Russian fighters, he must "think Russian" to shoot anti-aircraft missiles at his adversaries. He is successful, eludes the enemy and returns the next generation aircraft to the United States.

Presumably, the Russians had cracked the code at reading brain waves and developed this technology to control the aircraft with the pilot's mind. Forty years ago, the thought of this technology was science fiction. Fast forward to 2023 and recently a group from the University of California Berkley[1] used predictive artificial intelligence (AI) modeling of auditory stimuli to reconstruct the classic song "Another Brick in the Wall" (figure 1). This act demonstrated the plausibility of using brain waves to determine real-time cognitive activity. Indeed, applications of AI regarding aerospace medicine are broad and have the potential to dramatically improve safety by recognizing hazards and preconditions that may predispose aviators to mishaps. Some of the ways AI may assist aviators in the cockpit include predictive analysis, real-time monitoring, alert systems, sensor fusion, machine learning for pilot training, data analysis and accident investigation.

How may aeromedical researchers leverage this emerging technology to combat the most common pre-conditions that contribute to aviation mishaps? Upon review of the cited pre-conditions involved in naval aviation mishaps between 2012 and 2022, the top four attributed conditions involved in Class A, B and C mishaps were fatigue, spatial disorientation, visual illusions and hypoxia/hyperventilation[2] (figure 2). The common denominator for these conditions that make them so dangerous is their impact on the aviator's cognitive performance.

Recently, both fatigue and spatial disorientation have been evaluated in simulated aviation environments with semi-dry and dry electro-encephalogram (EEG) systems[3,4]. Basically, an EEG is a device that uses electrodes placed on your scalp to measure electrical brain activity. The brain activity is typically classified in five various frequencies, from highest to lowest: gamma, beta, alpha, theta and delta. Each frequency has been shown to correlate with specific cognitive states (figure 3).

Demo on PLOS Biology site.

Realizing the need for accurate and reliable real-time sensors to evaluate cognitive performance in the cockpit, Rice (2019)[5], evaluated the ability for dry EEG technology to detect hypoxia. As compared to wet EEG, dry EEG, as the name implies, does not require extensive preparation on the subject to connect and does not require transducer gel to improve signal transduction. Both advantages lend to transitioning this technology to an operational environment (figure 4). The research suggested a reduction in overall dry-EEG power could identify hypoxia in lieu of aviators not recognizing

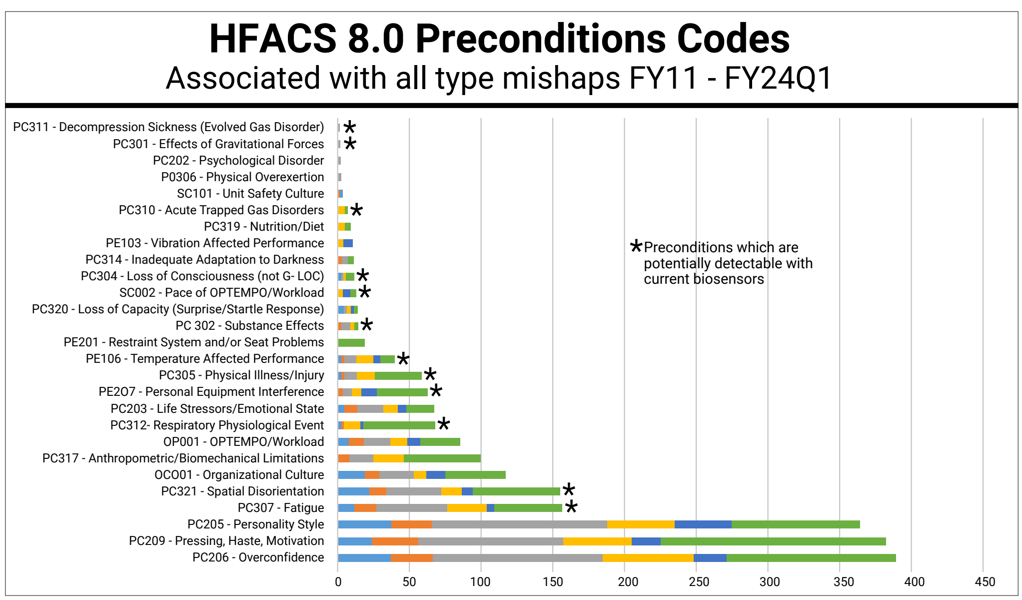


Figure 2. The most common *detectable* naval pre-conditions associated with mishaps between FY11-FY24.

their own meaningful decreases in oxygen saturation and cognitive performance (figures 5 and 6).

Linnville and Snider respectively advanced this work further by reducing the variance of the data sets through principal component analysis (PCA) and then applying three common AI algorithms: decision tree, Neuralnet and Naïve Bayes[6]. By doing so, these researchers increased the sensitivity and specificity of dry-EEG technology to detect hypoxia to greater than 97%. Simply put, AI is a method of teaching computers to "think" by way of algorithms and machine learning in much the same way a human would make deductions by way of probabilities.

For example, as a doctor I may ask a simple yes or no line of questioning to my patient to determine the cause of their cough. Do you have a fever, do you smoke, and has your cough been greater than two weeks? The summation of these answers allows me to assign the most probable condition to the symptom. Similarly, commonly applied AI algorithms either through binary questions or assigning probabilities can assign specific cognitive states if provided EEG data.

Dr. Snider used the cut-off value of brain wave power, beta < -0.68 as the root (or base) for his computer questioning (figure 7). The computer then asked the binary (yes or no) question, "Is the value being evaluated greater than or less than -0.68?" If yes, the algorithm tells the computer to answer the next question which was, "Is the brain wave power of Beta < -1.1?" If the answer to the question is yes, then the computer determines the pilot meets hypoxic criteria. If no, then the computer answers subsequent questions to determine whether the pilot is hypoxic. Once acquiring data through research, computer scientists create training algorithms through coding and then test these algorithms on data that has not been seen previously. Data that has not been seen previously by an algorithm is typically referred as a "hold out" set of data. After developing the following decision-tree training algorithm, Snider applied that algorithm to a "hold out" set of data and found it was over 98% sensitive and specific to identifying hypoxia through reductions in brain wave amplitude.

Decision-tree is just one of many types of AI algorithms. Naïve Bayes and Neuralnet are two other common algorithms that were applied to Rice's 2019 data with both also achieving greater than 90% sensitivity and specificity at detecting hypoxia. Hypoxia is only one of several significant pre-conditions associated with mishaps. The most common

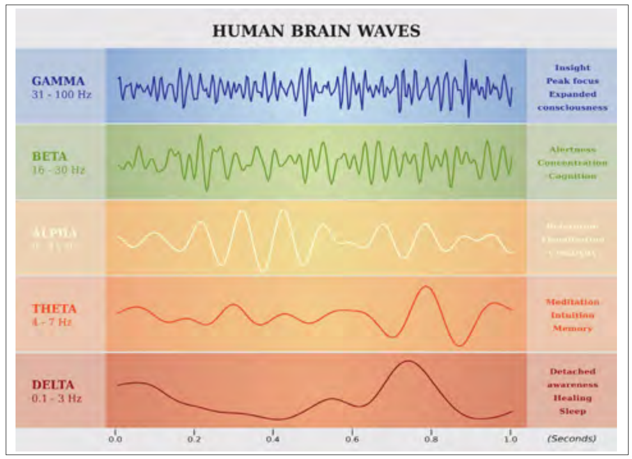


Figure 3. The five common brain frequencies and the state of cognition they represent.

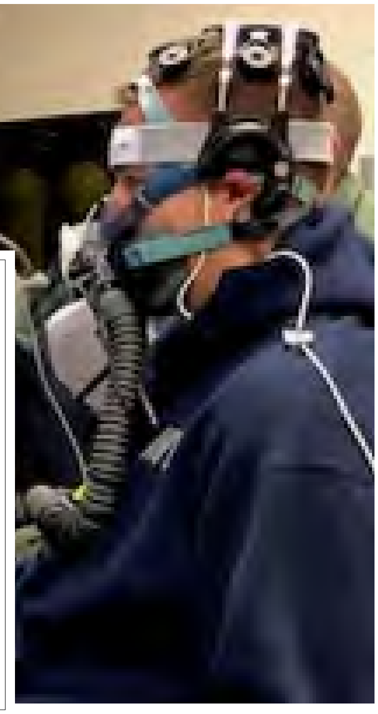


Figure 4. Dry EEG device in study (2019).

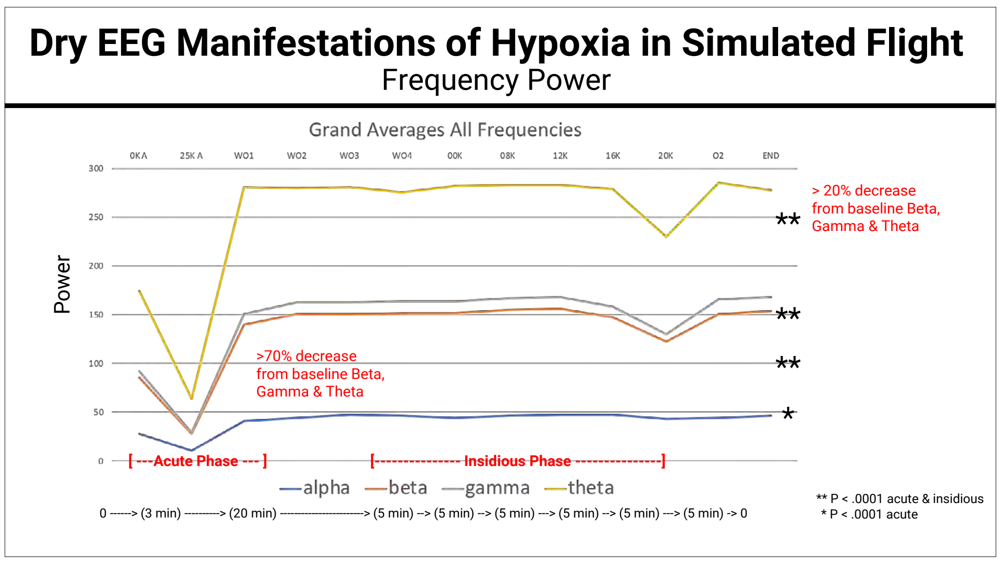


Figure 5. Significant decrease in brainwave frequency amplitude when exposed to both acute and insidious hypoxia.

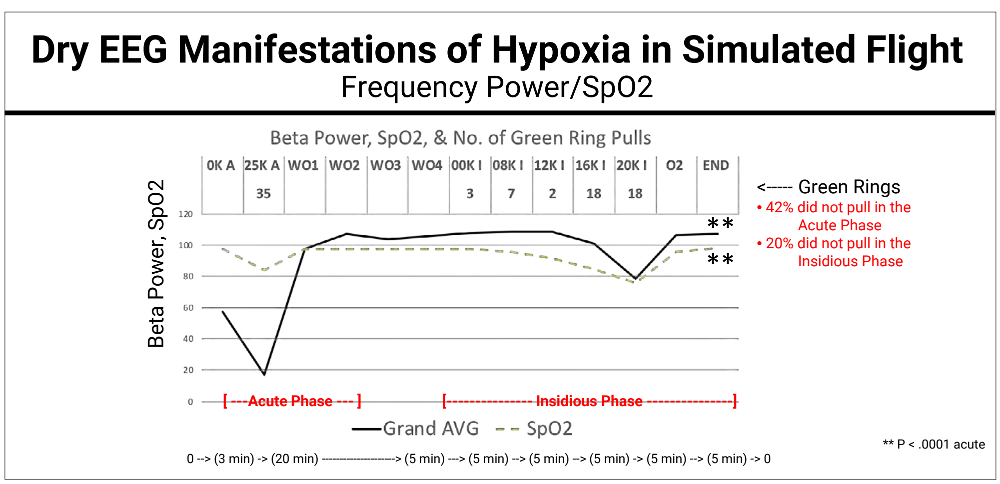


Figure 6. Significant decrease in brainwave frequency amplitude with pilots unaware of hypoxia symptoms.

(Continued on next page)

Dry EEG Manifestations of Hypoxia in Simulated Flight

Deep Learning

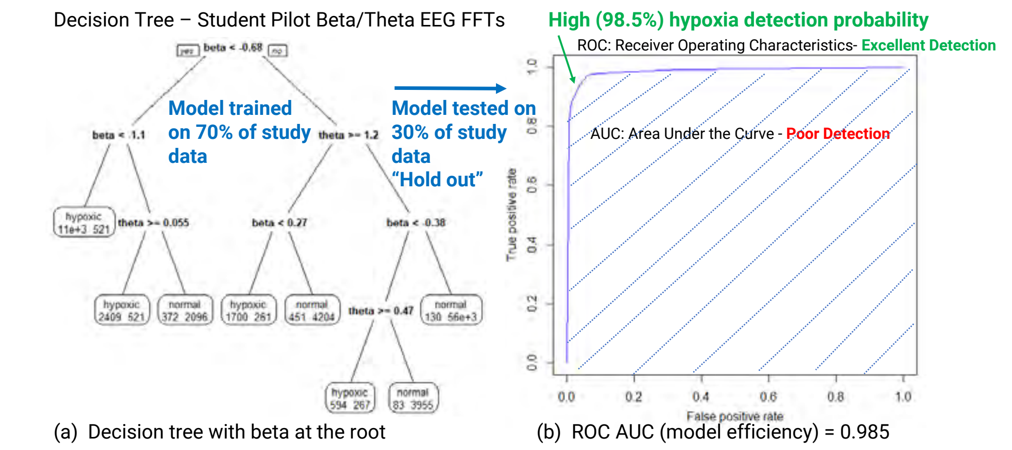


Figure 7. Decision Tree AI algorithm using brain wave amplitudes to identify hypoxia. Training model developed on the left and then tested on "hold out" data on the right achieves 98.5% sensitivity at detecting hypoxia.

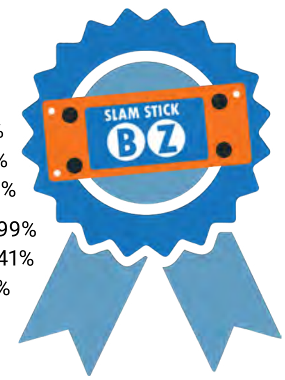
SLAM STICK BZ

Top performing Navy and Marine Corps squadrons for Slam Stick matching from recent months. Bravo Zulu to the winners.

May: 1) VAQ132: 100%
VAQ-134: 100%
VFA-32: 100%

April: 1) VAQ-134: 100%
2) VFA-32: 99.48%
3) VAQ-131: 98.41%

March: 1) VAQ-131: 98.99%
2) VAQ-134: 98.41%
3) VFA-2: 96.24%



pre condition associated with Class A mishaps is spatial disorientation and the most common pre-condition associated with all mishaps is fatigue (figure 2). How can AI and brain waves be used in the future to combat these two most common pre-conditions? Broadly, when developing a framework to evaluate the ability of a particular technology to detect an aviation hazard you can divide the acquisition into four phases: Crawl, Walk, Run and Fly (figure 8).

Like the 2019 Rice study, the first step in evaluating whether EEG technology could potentially identify fatigue or spatial disorientation in the cockpit is to create the condition "in vitro,' or simulated flight conditions. As mentioned previously, there have been a few recent publications that have looked at fatigue[2] and spatial disorientation[3] with EEGs. It would be very feasible to replicate these studies with the addition of applying principal component analysis and AI algorithms to the acquired data. When acquiring data from three-dimensional sensors such as dry-EEG electrodes, it is important to reduce the variance or "noise' of these sensors through principal component analysis before applying AI algorithms so the algorithms trained are using data with the least variance. Future studies using dry-EEG technology must endeavor to reduce variance and/or noise acquired from sensors or run the risk of the AI algorithms not being as accurate.

Once proven you can identify the particular aviation hazard in question, as with the hypoxia study, you develop AI algorithms that are predictive of identifying the condition. (WALK) Once you have this capability, it is imperative to further analyze the equipment. Once proven you can identify the particular aviation hazard in question, as with the hypoxia study, you develop AI algorithms that are predictive of identifying the condition (WALK). Once you have this capability, it is imperative to further analyze the equipment within a controlled operational environment by integrating with the helmet and cockpit avionics (RUN). Finally, once hardening the technology, a prototype sensor for the helmet could be transitioned to the fleet. It only took me one minute to write the final two sentences, however, the last two phases of research and development are often the longest and most difficult to overcome. Cooperative research and development agreements often need to be established between companies fabricating and integrating the technology to multi-million-dollar cockpit and helmet displays. Realistically, this time frame is often upward of a decade or more, but most good things come to those who wait. So as we look into what the future may hold with manned aviation, it may very well be that the most important system (the brain) of the most important instrument (the pilot) could finally be integrated, along with the hundreds of other data points being analyzed from aircraft components, to enable peak safety and performance. ✈

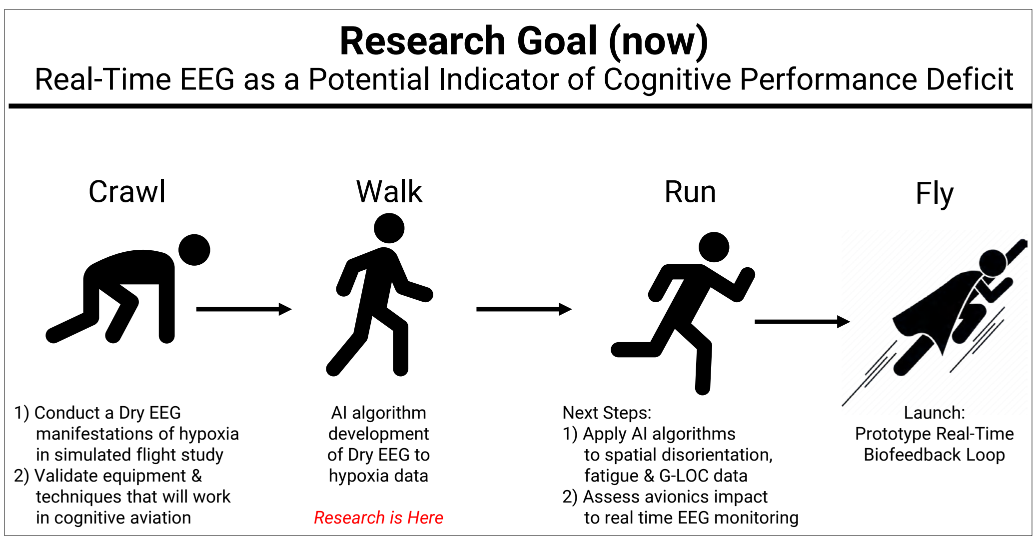


Figure 8. Phases of research and development using AI algorithms.

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~~HOT~~ HOTTER

By Lt. Cmdr. Alex Squires

UNMANNED PATROL SQUADRON (VUP) 19 *BIG RED*

It was July 8, 2023, and I was beginning my permanent change of station from San Diego, California, to Jacksonville, Florida. My wife and young son flew for the trip while I had the task of driving the car loaded with our two dogs and cat. I knew it would be hot, but I wasn't quite prepared for what I was about to experience.

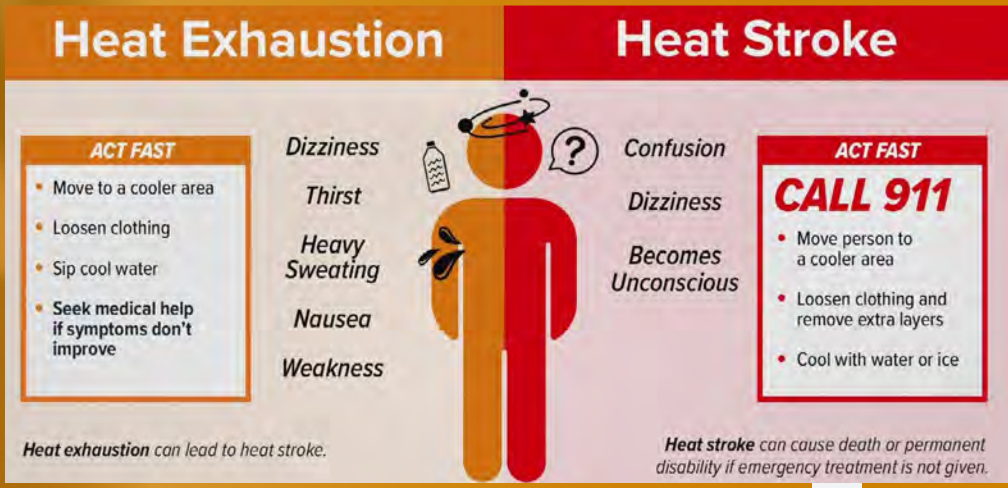
It was around 70 degrees F when I departed San Diego and my first stop was El Centro, California. I was comfortable with the air conditioning blasting in the car, but when I stopped and opened my car door the heat was like being hit with a brick wall. I felt like I was going to have a panic attack. I immediately had to turn the car back on and figure out how I was going to make this trip work. I couldn't just leave the animals in a hot car. but inevitably there would be times I had to leave the car. For example, many rest stops won't let you take animals inside with you.

The extreme heat put me in a tricky situation. Due to the way my car was designed, I had to choose between keeping my car's air-conditioning on with it unlocked or have the car locked with the air conditioning off. I elected the former, prioritizing the health of my pets over the security of the vehicle. It continued to get hotter as I crossed into Arizona, New Mexico and Texas. Luckily, it cooled off a little bit once I crossed into Louisiana, Mississippi and Florida but it was still dangerously hot! Temperatures across the United States are on average 11 degrees above the national averages taken from 1991-2020 and chances are it's just going to get hotter. Twenty-eight states have experienced a top 10 warmest January – July with Florida experiencing its warmest on record.

Temperatures regularly reached what is called "black flag conditions" in the summer of 2023, which denotes a Wet Bulb Globe Temperature of 90 degrees Fahrenheit or above, when outdoor physical exercise and training are suspended outside of operational commitments. Outdoor physical exercise and training during black flag conditions are suspended outside of operational commitments, no amount of shade or hydration will keep you safe. The danger is in the event of a power loss, many people will be susceptible to heat-related injuries and even death. Many of our service members are stationed in these southern states that are experiencing these extreme temperatures. It's been said many times but we need to ensure our people are properly hydrating and being smart about their outdoor activities. It's also important to be knowledgeable on the symptoms of heat exhaustion and heat stroke.

While it's important to stay active; outdoor activities during the height of the day put people at increased risk for heat-related injuries. Instead we should do our outdoor activities in the morning or evening when the temperatures drop to safe levels and the sun hasn't reached intense levels yet.

The dangers of extreme heat extend to the workplace. Whether it's maintainers working on aircraft on the flight line or aircrew troubleshooting issues on deck, the heat can impact performance and cause very real safety concerns. It is important to understand our work environment and put procedures in place to keep our most valuable asset, our people, safe during extreme weather. ✈



The high summer temperatures and humidity levels add an extra layer of difficulty. Moody Air Force Base, Georgia, July 23, 2021. (U.S. Air Force photo by Staff Sgt. Devin Boyer)

THE IMPORTANCE

By Lt. Scott Van Hoy

UNMANNED PATROL SQUADRON (VUP) 19
BIG RED

We all know the feeling when morale is collectively low within a squadron. While spotting low morale is easy, diagnosing its root and finding solutions to address this pervasive feeling proves challenging. Part of the issue with understanding the cause and effect of a squadron's morale is the lack of discussion and definition of morale.

When reviewing 16 aviation-related textbooks covering human factors, human error, psychology, safety management and crew resource management, only two of those 16 books attempted to discuss the impacts of morale and those discussions did not exceed one paragraph. Additionally, the Naval Air Training and Operating Procedures Standardization (NATOPS) General Flight and Operating Instructions Manual CNAF M-3710.7 nor the FAA Aeronautical Information Manual mention the word morale. In aviation literature, training curricula and operating procedures, morale is not defined. If low morale is often perceived as a squadron hazard and the members of a squadron are generally good at identifying low morale, then a better understanding of morale, what it is and what causes it can help squadron leaders assess, make risk decisions, implement controls and supervise squadron morale.

DEFINING MORALE

Historically, the military does not doctrinally define morale. Practically, it is not the definition that is important, but rather what a squadron can do to improve it. It is accepted that squadron morale is important, and programs such as the Navy's Morale, Welfare and Recreation (MWR) programs were established to help squadron leaders improve morale. Knowing morale is important for mission accomplishment, military leaders often see morale as an end in itself and seek ways to improve it; however they do not fully understand what they are attempting to improve.

A good military definition of morale comes from the 1983 U.S. Army Field Manual on Leadership and is re-emphasized in the book Military Psychiatry: Preparing in Peace for War. Morale is defined as the mental, emotional and spiritual state of the individual. It is how [someone] feels - happy, hopeful, confident, appreciated, worthless, sad, unrecognized or depressed.

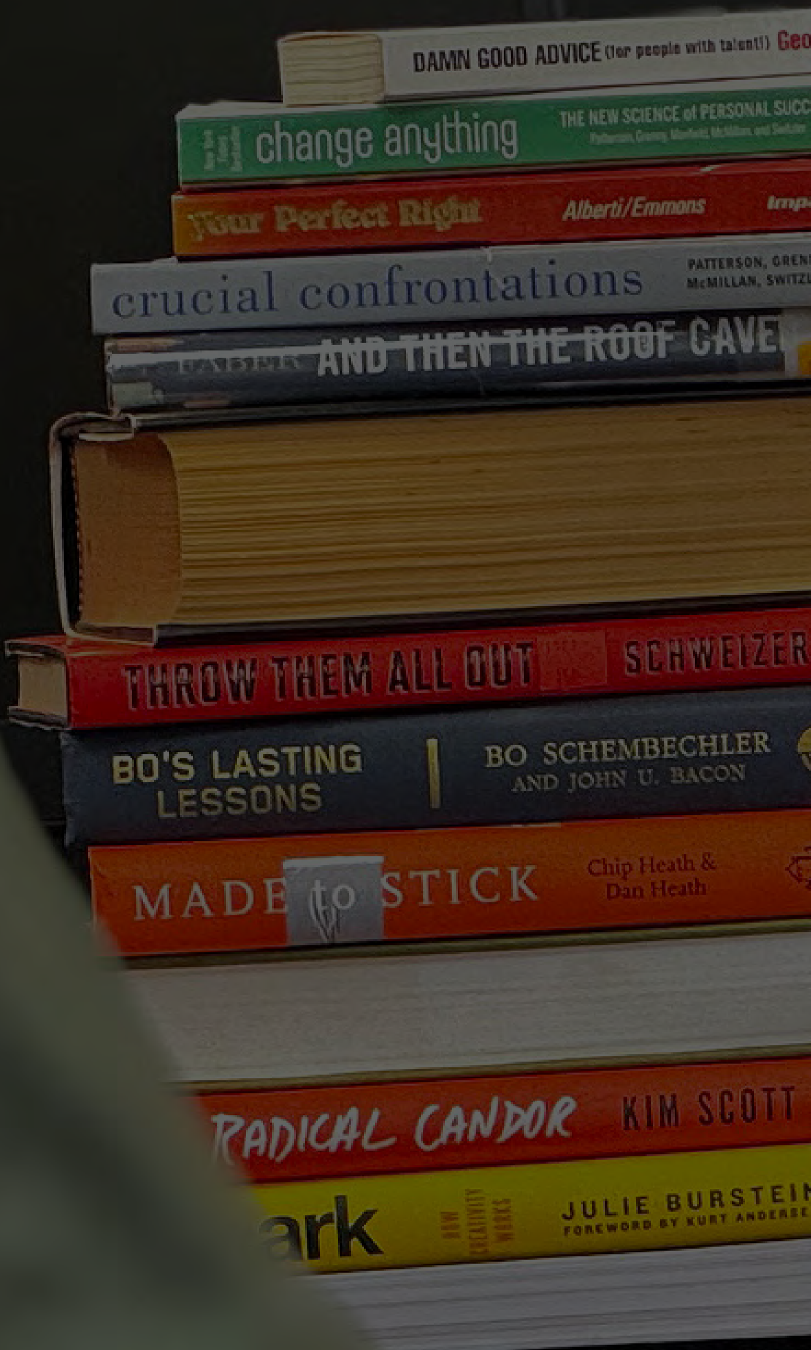
Therefore, to improve morale squadron leaders must address the Sailors' or Marines' mental, emotional and spiritual needs. If the mental, emotional and spiritual needs are met within a squadron, the will result in increased motivation and improved performance, safety and mission-accomplishment. The combination of the intangible needs of the Sailors or Marines being met and the resulting motivation to perform, improving mission effectiveness, is morale. Morale is when intangible needs are met, fueling motivation and boosting mission effectiveness.

Defining morale as the sum of each person's feelings is simplistic. The psychological aspects of the Sailors' or Marines' mental, emotional and spiritual health directly influence the Sailors' or Marines' desire to exhibit behaviors that are inline with the squadron's objectives. One's feelings and resulting behaviors within the framework of morale was expertly described by John Bayes book Morale: A Study of Men and Courage (1967).

He defined morale as,

- Behavior: "A confident, resolute, willing, often self-sacrificing and courageous attitude of an individual to the functions or tasks demanded or expected of him by a group of which he is a part ..."
- Psychology: "... that is based upon such factors as pride in the achievements and aims of the group, faith in its leadership and ultimate success, a sense of fruitful participation in its work and a devotion and loyalty to the other members of the group."

It is evident how Sailors' or Marines' think and feel is the basis of morale. To reap the results of morale and increase squadron performance, safety and mission accomplishment, morale should be managed at this baseline level.



OF NAVAL MORALE

ASSESSING MORALE

The Navy has tools available to commanders that help them assess morale. The Defense Organizational Climate Survey (DEOCS) is one such tool that can provide excellent insight into the state of the squadron. For a more grassroots assessment, Frederick Manning, the author of Military Psychiatry: Preparing in Peace for War (1944), offers a series of questions that leaders can use to assess their unit's morale. Here is a list of questions that are most applicable to aviation squadrons: Is there a large number of requests to leave the unit?

- Are reenlistment rates low?
- Is there a high incidence of infractions that require legal or other disciplinary actions?
- Is there a large number of daily sick calls?
- Does the unit help others and take collections for those who are in the hospital, when there is a death in the family, a new baby or other significant life event?
- Do unit members enjoy socializing outside of work settings?
- Do unit members have a sense of loyalty or commitment to their leadership and their peers?
- Do the Sailors or Marines have confidence in their leadership and their peers?
- Do leaders maintain technical competence?
- Are put-downs prevalent in the squadron?
- Is communication effective?
- Do leaders have the time and availability to generate trust and confidence?
- Do Sailors or Marines use inclusive language such as we showing team-based attitudes?
- Do leaders solicit input from their Sailors or Marines for decisions that affect them?
- Do all unit members know what the mission, goals, values and priorities of the squadron are?
- Does the squadron have intra-unit turbulence such as frequent movements, stability in face-to-face relationships or frequent positional turnover?
- Do senior leaders reward subordinate leaders for being loyal to their Sailors or Marines and not to those who enthusiastically say yes to senior leaders' ideas?
- Do senior leaders give subordinates credit for their work?
- Do leaders actively seek out tasks on which a unit can succeed and ensure they aren't pursuing unreasonable demands from higher headquarters?
- Is there perceived organization and order within the squadron?

These questions mostly assess the behaviors associated with low morale and do not directly determine the psychological causes of these behaviors. Answering negatively to any of these questions shows the symptoms of low morale, but may not uncover the root psychological cause. If a negative answer to any of these questions is present, before implementing a tangible solution to the problem, leaders should talk to their Sailors or Marines to ask the why questions regarding how the Sailors or Marines feel about the identified symptom.

WORKING TOWARD THE TANGIBLE SOLUTIONS

When a squadron is faced with low morale and assessing this hazard, leadership should look to the core of the issue and assess what is hurting the Sailors' or Marines' mental, emotional and spiritual health. While some of these needs may seem trivial at times, care should be taken not to cause further emotional harm by minimizing the needs of the squadron members, further reducing morale. Additionally, the risk decisions and controls to mitigate the potentially harmful impacts of low morale may be from a mission-accomplishment standpoint. What appears best for the mission may reduce morale; yet, morale should be critically assessed to determine if a short-term mission success may impact the long-term effectiveness and safety of the squadron.

The best methods to improve morale are known by leaders who take the time to understand the needs of the Sailors or Marines. Leaders overseeing low-morale units should take time to analyze what is making the Sailors or Marines feel happy, hopeful, confident, appreciated, worthless, sad, unrecognized or depressed. For example, Sailors or Marines asking to transfer from the unit or indicating that they would rather be in another unit may be caused by a sense of feeling unrecognized, or they might feel worthless to the squadron or perhaps they feel unhappy about a particular part of their job. A leader will never know the reason for the Sailors' or Marines' behaviors and morale until they are asked specific and forward questions about their feelings, mental and emotional health.

Aviation doctrine and research has not focused directly on morale and discussions surrounding this topic are not readily available to promulgate to aviation squadrons. The concept of morale is often oversimplified leading to a lack of understanding about what low morale means for a squadron. Even in this article, the concepts surrounding morale are oversimplified and are primarily adapted from Army and Air Force discussions of morale that resulting from major conflicts in the latter half of the 20th Century.

Despite these limitations, this article serves as a brief overview of how morale can be defined, assessed and if morale is low, how to take steps toward raising it to improve squadron productivity. It emphasizes that there is no cookie-cutter approach to improving morale and that leaders should ask questions based on the Sailors' or Marines' mental and emotional health to determine what is causing the behaviors and outcomes that encompass low morale.

Literature on morale shows "…psychological needs [are] clearly more important influences on aircrew morale than any other category," (USAF Lt. Col. J. Zentner, 2001). Leaders can use this knowledge to ask the correct questions about the collective feelings of the Sailors or Marines to get to the root cause of low morale to make the most informed decisions for how to address this hazard and improve squadron performance. ✈

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Naval aviator desk with stack of books about leadership, personal success and culture changing. Norfolk, Virginia, August 8, 2024. (U.S. Navy photo by Ani Pendergast)

A P-8A Poseidon assigned to Patrol Squadron (VP) 46 takes off from the runway at Naval Air Station (NAS) Sigonella, Italy, Jan. 17, 2024. (U.S. Navy photo by Mass Communication Specialist 2nd Class Jacquelin Frost.)

CREW REST = PEAK PERFORMANCE

By Lt. Joe Esposito

PATROL SQUADRON (VP) 26
THE TRIDENTS

Maintaining superiority in the anti-submarine warfare (ASW) domain remains a pivotal role of the P-8A. Paramount to maintaining regional maritime security, the missions involve detecting, tracking and potentially neutralizing submarines. It requires advanced technologies and highly coordinated prosecution from dissimilar air, sea as well as subsurface assets.

Historical P-8A tanker execution rates range between 50% and 60%; we have been able to successfully execute with higher success by communicating potential changes due to weather, maintenance or rendezvous point early and often while providing strategic solutions.

Some of these strategies have included: conducting air-to-air refueling (AAR) en route to deployment to mitigate the range and crosswind limitations of the advanced airborne sensor equipped aircraft, coordinating to meet a tanker transiting home following AAR with previous ASW event, conducting AAR with multiple tankers during an on-station period, delaying AAR until a distributive search pattern is laid to allow room for additional fuel on-load, requesting the tanker to delay overhead to allow for a "top-off" to maximize coverage, and countless real-time changes to the AAR rendezvous point.

The myriad ways to creatively execute AAR to meet our demands is endless, but the benefits it can provide in a blue-water conflict are sufficient to answer the age-old question that the benefits outweigh the cost. One of the traditional limiting factors facing airborne ASW assets is the fuel endurance and range of their aircraft. While employing AAR during ASW prosecution has been successfully executed in the past, the natural maturation of this concept of operations presents unique challenges that require a thorough hazard analysis. As we adapt to meet the emergent capabilities of our near-peer competitors, stretching the endurance of our airframe through ad-hoc and innovative AAR, execution becomes a necessity. With this rapid innovation comes inherent risk that demands careful examination and mitigation strategies.

Conventional fuel planning considerations are further complicated by the unpredictable nature of ASW missions in which multiple climbs, descents and airspeed profiles as well as shifting operating areas may be necessary to meet mission objectives. In an ideal world, the timing works out perfectly to meet the tanker en route to the operational area and we simultaneously disconnect fully refueled with 65,000 pounds of fuel. During this deployment, VP-26 employed a flexible approach to AAR during intelligence, surveillance, reconnaissance and ASW prosecution to meet the imperfect environment in which we operated.

By adaptively executing AAR capabilities into ASW aircraft, crews can now extend their mission duration, covering larger areas and increasing the probability of detecting and engaging adversary submarines. This enhanced endurance significantly expands the operational capabilities of P-8A Poseidon and allows us to rise to meet these emerging threats effectively. The ability to remain airborne for longer periods enables crews to conduct more thorough searches, monitor suspicious activities and provide timely support to surface ships in need of protection.

Despite the stated benefits, this flexible posture presents potential for elevated risks. Extending ASW missions causes increased fatigue, crew-rest complications and exacerbates shifts in circadian rhythms. Crews engaged in AAR must adapt to irregular schedules and disrupted sleep patterns, which can potentially lead to fatigue-related performance degradation. Fatigue affects critical decision-making, vigilance and reaction times, increasing the risk of errors and accidents. To mitigate the risks associated with extended missions and disrupted sleep patterns, VP-26 is working on ways to implement rigorous fatigue management strategies. Some strategies that we have employed are optimized crew scheduling, adequate rest periods, and adding a fourth pilot to flights when able to allow for longer durations of sleep in-flight.

The VP-26 safety team has determined crews should undergo comprehensive training on fatigue management, recognizing the signs of fatigue and employing effective countermeasures to maintain their alertness and performance. An issue that has been noticed with the aircraft is the installed crew rest seats in the aircraft are less comfortable than the venerable P-3C Orion racks and it is difficult for safety-of-flight aircrew to obtain quality rest or fall asleep in a timely manner.

To address this concern and prioritize the well-being of the crew, some crews have taken innovative measures. Recognizing the importance of adequate sleep for best performance, crew members have started bringing small air mattresses on board and setting them up on the port side, aft of the 5th mission crew workstation. This improvisation allows crew members to enhance their quality of sleep, mitigate the effects of fatigue and ensure they remain alert and effective during critical ASW missions. While an effective mitigation, this requires smooth air as personnel must be prepared to set condition V rapidly if weather conditions deteriorate.

Integrating AAR capabilities has undeniably revolutionized ASW missions, vastly expanding their operational potential. However, striking a delicate equilibrium between extended mission endurance and the safety and efficiency of our crews remains of paramount importance. The prudent implementation of fatigue management strategies is the key to empowering ASW crews to achieve peak performance while mitigating the inherent risks linked to prolonged operations. By adopting this holistic approach, we can uphold maritime security with unwavering dedication while safeguarding the well-being of our personnel and aircraft.

The Tower Buzz

Naval airport operational environment report by Paul Widish, Naval Aviation Analyst

Naval aviation is in continuous operation…are you managing your risk?

Every day across the fleet's 52 naval airports, our Naval aviation enterprise is hard at work – from your flight line, air traffic control tower, outlying fields and special use airspace – performing countless tasks necessary to ready our warfighters for their next deployment.

Things don't always go as planned and emergency situations arise on the ground and in the air. In these situations, prescribed emergency plans can augment Chief of Naval Operations (CNO) directed instructions that protect our people, equipment and mission.

FLEET SMS REQUIREMENTS

The CNO's Safety Management System (SMS) works as a systemic forcing function to achieve mission assurance (MA), per OPNAV M-5100.23 CHG 2. Chapter 1, Section A0104 lists four desired outcomes of the SMS required to achieve MA, as specifically measured from commands' ability to be safe to operate and to operate safely. These outcomes are the "4Ps:"

1. *Safe Place*: Achieve and sustain a safe workplace or working environment, ensuring emergency protocols and systems are operable and tested regularly.
2. *Safe People*: Workers and their supervisors are trained and qualified on all aspects of conducting their work properly, including gaining valuable experience, skill proficiency and currency, are procedurally compliant, risk-aware and fit to work (general health and well-being).
3. *Safe Property/Material*: People in their work environments have access to proper tools, equipment, machinery, infrastructure and whole equipment systems.
4. *Safe Processes/Procedures*: Proper and accessible standard operating procedures, emergency procedures, safety procedures, maintenance standards, etc., are present and available in the necessary working environments.

The Airport Emergency Plan. Seconds count when an emergency unfolds and only a set of prescribed emergency response protocols that is established – and practiced – will yield the right level of pre-mitigation procedural guidance to afford every participant at air-capable installations the maximum incident response clarity to prevent unplanned emergency situations from escalating beyond the installation's response capability. Adhering to these protocols will also guard against potential serious injury (or worse), loss of critical infrastructure and equipment. This set of emergency response protocols is called the Airport Emergency Plan (AEP).

Some might think that exigent risk management occurs when your installation's pre-mishap plan or aircraft salvage plan is implemented. No, these plans help provide critical steps after an emergency has already occurred. An AEP defines and deploys the immediate action steps necessary to respond to an airport emergency that is underway. Your installation's incident commander isn't breaking out the pre-mishap or aircraft salvage plans to coordinate with air traffic controllers on the inbound aircraft emergency response. Exigent risk management protocols are the strategic and tactical immediate action emergency response procedures and tasks necessary to provide time-critical coordinated emergency response to protect aircrew, aircraft, passengers and critical infrastructure and equipment. Outside the Department of the Navy's fence line, AEPs have been in place guarding airport operations –large and small – for the past 35 years, as prescribed by the Federal Aviation Administration's Advisory Circular 150/5200-31.

Naval Safety Command has a generic template of a naval airport AEP that has already been put into action successfully in the fleet. Use this to help kick-start your local risk accountability discussions among your naval airport operators, airport service providers and airport users.

U.S. Marine Corps air traffic controllers with Headquarters and Headquarters Squadron, Marine Corps Air Station Miramar, observe and maintain daily operations from the air traffic control tower at MCAS Miramar, California, March 5, 2024. (U.S. Marine Corps photo by Sgt. Sean Potter)

BRAVO ZULU

★ SAILORS AND MARINES PREVENTING MISHAPS ★

LIEUTENANT JOHN ADOLF

TRAINING SQUADRON 21 (VT-21)

THE REDHAWKS

Due to his expert situational awareness, forward-leaning safety mindset and timely decision-making, a potential mishap was prevented. In March 2024, Adolf was instructing a cross-country training flight in a T-45C Goshawk jet trainer in the Nashville, Tennessee, area.

After the student lowered the landing gear while on the final approach, Adolf noticed his aircraft's right main landing gear light was not illuminating. After confirming the actual light was not burned out, Adolf declared an emergency and requested vectors for troubleshooting from Air Traffic Control. After completing the landing gear unsafe/fail to extend checklist and not receiving safe gear indications, he directed his student to perform a low approach to receive a visual inspection from the first responders that visually confirmed the safe extension of the aircraft's landing gear.

Thanks to Adolf's outstanding headwork, the aircraft was recovered in an uneventful, safe manner. Bravo Zulu, Lt. Adolf!

NO PARKING

By Lt. AJ Bihl

PATROL SQUADRON (VP) 26

THE TRIDENTS

Imagine arriving at a new worksite, only to discover there's no designated parking spot for your team's large vehicles? No parking provided was the situation we faced while deployed to Gander, Canada in Newfoundland.

When conducting detachment operations, there are often many challenges that arise from both an operational and a logistical perspective. Our detachment to Gander was no different. We were operating out of Gander International Airport, once one of the busiest airports in the world. As a refueling stop for transatlantic flights, the airfield had fully capable facilities for our four P-8A aircraft to conduct 24-hour operations. However, our pre-detachment site visit revealed a logistical challenge that would require a good deal of deliberate operational risk management (ORM) before the arrival of the full detachment. Following a discussion with airfield management, we realized we would not be able to use the normal parking ramp located next to the passenger terminal because our aircraft was loaded with ordnance. We set out to find a solution and decided on using some of the taxiways that usually received minimal traffic.

The next obstacle was to determine how we would handle the logistics of moving four aircraft to and from the makeshift taxi spots. Both the maintenance personnel and the pilots set out to determine where the best locations for each aircraft would be and how we would safely move past parked aircraft when departing and arriving. We walked the taxiways, measuring clearances as we went to determine how much space would be needed for safe aircraft movements. Once the optimal parking spots and safe taxi lines were determined, they were marked on the taxiway. Maintenance control generated a parking diagram of the taxiway with parking spots and directions the aircraft should be facing. This diagram was provided to all of the pilots who arrived after this work had been done, making the transition into this non-standard ramp environment seamless. With airfield management's approval, we installed temporary grounding posts to facilitate safe fueling as well as ordnance loading and unloading.

When the time came to park the additional aircraft, we decided it would be standard operating procedure to place wing walkers on the aircraft taxiing as well as safety observers monitoring all hotspots where aircraft would be in close proximity. We took it slow and made sure everyone involved in the movement felt comfortable with their responsibilities and was empowered to call the evolution to a halt if things started to become unsafe. The overall takeaway gained from this exercise in ORM was that, when given the time and opportunity, a deliberate analysis of the risks can turn an uncomfortable situation into a routine one. Our multiple risk mitigations took what could have been a ground mishap waiting to happen and created a safe and efficient operating environment. ✈

Airport runway in Gander, Newfoundland, Canada. (Photo courtesy Gander International Airport)

WILDLIFE STRIKE

By Lt. j.g. Jake Brophy

PATROL SQUADRON (VP) 45
THE PELICANS

Wildlife strikes pose a significant hazard to aviation safety, endangering aircrew and causing extensive damage to aircraft. To put this in perspective, there were 1,180 wildlife strikes in 2023 reported to the Naval Safety Command. Seventy-two resulted in mishap classification and 24 resulted in Class C mishaps or higher.

Class C mishaps are defined as incidents causing a minimum of $60,000 in damage or non-fatal injuries resulting in lost time from work. On the civilian side, more than 18,600 wildlife strikes were reported to the Federal Aviation Administration (FAA) in 2023. The vast majority of these were reported without damage, but 61 reported having sustained substantial damage from the strike. Comparing those numbers to a decade ago, there were 194 reported strikes on commercial aircraft with substantial damage or higher in 2013 out of 11,000 reported strikes. While the total number of wildlife strikes has increased since a decade ago, it is encouraging to see that strikes resulting in serious damage to aircraft are becoming less common. This change is due in part to the mitigation tools and aircraft technology that have been developed for wildlife strike mitigation over the last decade.

Through proper preflight planning and risk assessment, one way to mitigate wildlife strikes can be achieved before we even board the plane. The Air Force has developed the Avian Hazard Advisory System (AHAS) in order to give pilots the best possible look at predicting bird hazards to aviation. AHAS uses data from the National Oceanic and Atmospheric Administration's (NOAA) Next Generation Radar (NEXRAD) and filters out non-biological returns to determine the density of bird populations in the air for a specific region at any given time. This information is updated roughly every 10 minutes and is made available to pilots online for their situational awareness and risk assessment during preflight planning. AHAS also uses predictive models based on historic bird behavior and migration patterns for the given day to enhance its prediction. This tool is an incredible resource for pilots in the preflight planning phase to make risk decisions based on the severity of bird strike hazard for the given day.

Airfields in the United States have also had a large part in decreasing the amount of bird strikes. The FAA requires airfield managers to take steps to lessen the danger birds pose to aircraft. As a result, airfields manage the habitat around them to make their area less attractive to birds by changing vegetation or creating buffer zones between nesting areas and the runway. Airfield managers also use deterrence techniques such as predator decoys, pyrotechnics and firearms to keep birds away from runways. There are also wildlife control programs which involve trapping or killing wildlife to manage bird populations and lower the risk of bird strikes.

Finally, as a last line of defense, aircraft technologies have been redesigned to be more resilient to bird strikes. Aircraft engines have been revamped to be better equipped to handle bird ingestion and continue operating to allow the aircraft to land safely. Aircraft windscreens have also been overhauled to handle direct bird strikes and prevent bird remains and broken windscreen fragments from entering the cockpit.

As P-8 pilots, we spend a lot of time in the terminal area in the landing pattern or down low doing our mission set over the water. Both of these environments are also frequented by many bird species, and as a result the P-8 is highly susceptible to taking a bird strike. Luckily, the P-8 has been designed with many of the features aforementioned in order to make it more resilient to bird strikes. However, it is important as pilots that we continue to use the tools available to us in determining the risk of bird strikes and take the proper steps to mitigate those hazards. Things such as leaving the auxiliary power unit running, or wearing your helmet while taking off into an area of high bird activity can further mitigate the hazards presented by birds.

By reporting bird strikes as they happen, we provide the Naval Safety Command with data to improve future mitigation techniques and decrease the hazards birds pose to safety. ✈

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An Albatross chick in nest at Pacific Missile Range Facility, Kauai, Hawai'i on Feb. 27, 2024. (U.S. Navy photo by Mass Communication Specialist 2nd Class Bodie Estep)

Windshield Vs Vulture

By Air Force Maj. Kevin Sack, VMMT-204
Director of Safety and Standardization

"Have you ever considered the possibility of your cockpit not protecting the occupants of your aircraft in a low-threat training environment? Until July 17, 2023, I certainly hadn't."

It was a decent weather day for training with high scattered clouds and calm winds, albeit a little hazy from the Canadian wildfire smoke that had made its way south. My crew had just completed its second round of a navigation route to a planned L-hour to the same landing zone about 50 nautical miles (roughly 57.5 miles) west of MCAS New River, North Carolina. During the first half of the sortie, we did not encounter any birds in vicinity of the landing zone, a departure from normal in the summer months in eastern North Carolina. We had just crossed the initial point inbound and were starting the descent at 240 KCAS (knots calibrated airspeed) to make our planned L-hour at the zone when out of nowhere there was a black flash and a loud bang…no one saw it coming. We had just hit a 5-pound black vulture at 1,000 feet above the ground.

The brain is a curious thing and temporal distortion, our perception of time, is real. I could not tell you how long it took for my brain to catch up to what had just happened to my aircraft, but it was readily apparent by the bird carcass that was now hanging inside my cockpit. The instant smell of death and smattering of tiny bird pieces on my face were supplemental confirmation of the situation. The first memory I have post-strike is telling my student pilot

Lieutenant Junior Grade Walker Russell happy to be on deck, covered in bits of black vulture carcass. Elizabethtown, North Carolina, July 17, 2023. (U.S. Air Force photo by Major Kevin Sack)

to climb as I had not reacquired my cockpit scan and had no idea how high above the ground we were. I asked if everyone was okay and my student pilot rogered up, but I did not hear from the crew chiefs. I turned left to look for the student crew chief who would normally be next to my left shoulder and he was no longer there. I queried again and the instructor crew chief rogered up that everyone was ok. Great, everyone was okay but we still needed to get this aircraft on the ground. I finally looked down at my displays and saw us decelerating through 160KCAS in the climb, I took controls. Between the undesirable aircraft state and the amount of time it would take to communicate my intentions, I decided to just take the controls and be directive. I applied power, leveled off and made the right turn toward Elizabethtown, knowing it was to the right and behind us only a few miles away. I instructed the student pilot to give us steering toward the airfield. At this point, my brain was still catching up with the aircraft and I recognized that my windscreen was compromised, so I slowed the aircraft down and entered conversion mode and continued at 110KCAS.

The aircraft was now safe and stable heading toward a safe landing point and we were about four miles from the airfield. My instructor crew chief came into the cockpit and did a status check of all the systems. At the same time, I was considering declaring an emergency with approach, whom we had just checked off with a few minutes prior. At that point we were less than five minutes from landing and were entering an extended downwind for the runway. I decided that declaring the emergency would only delay getting the aircraft on deck and there was not much approach could do for us anyway so we focused on the landing. I conducted a normal landing to the runway and we taxied clear to the ramp to shut down. Everyone was safe on deck and relatively unscathed, for which I continue to be grateful. It was not until the ride back in the recovery aircraft that the gravity of what had just happened finally hit me. In the days and weeks following this incident, I spent many hours in my head not only reliving the moment and my decisions, but what lessons learned could be shared.

THE MATR PRINCIPLE

Hopefully everyone at some point in their training learned the MATR principal: Maintain Aircraft Control, Analyze the Situation, Take the Appropriate Action and Reference the Checklist. What happens when there is no checklist? My crew fell back on Aviate, Navigate, Communicate. Personally, I also fell back on my Air Force flight training as our acronym is MATL, with the last step being Land As Soon As Conditions Permit. Regardless, aviating first by maintaining aircraft control is key. I'm proud of my student for continuing to fly the plane and listening to my direction to climb. Sometimes we skip over the basics because they have been parroted a million times, but days like this one reinforce brilliance in the basics.

FLIGHT EQUIPMENT

Take a moment to reflect how you were taught to wear and fly with your equipment versus how you operate day to day. Do you do every little thing right every flight? I'll be the first to admit that I don't. I am thankful that July 17, 2023, was a sunny day, which meant my entire crew had their sun visors down on their helmets. Most aircrew I know choose to forgo the clear visor as the scratches tend to reduce visibility, so we justify better visibility without the visor in the name of safety. However, had any of the three of us in the cockpit not have a visor down, we would have had bloody bits of bird carcass in our eyes, possibly leading to incapacitation (not to mention potential diseases or infection to follow). Worst case, all three members up front could have lost eyesight and a relatively simple emergency could have ended in a controlled flight into terrain. Your gear is there for a reason and it behooves everyone to wear it properly...every time.

COMMUNICATION

As soon as the aircraft was shut down, I was establishing communications with our duty officer back home. Within five minutes, home station had enough information to work a plan and within 15 minutes, a game plan was established to recover the crew and conduct an initial inspection of the aircraft. Information continued to flow over the subsequent hour to facilitate the FLASH report and OPREP-3 for higher headquarters, as well as getting medical treatment for the 4 out of 5 crew members that had been hit with bird remains. Why does this matter? Selfishly, it's so you can sleep in your own bed that night. Professionally, it allows your supporting agencies to best help you. The crew I was supposed to hot seat the aircraft to, now had to cold start a plane to recover us and that takes time. The on-call medical team had to be called in to perform four long form medicals. Higher HQ needs positive accountability of all of its assets that remain off station, especially where they originally were not scheduled to be. ✈


Major Kevin Sack received a moderate amount of splatter.


The bird was identified as a black vulture.


Damaged windshield upon landing.


Damage once the carcass had been collected for the BASH program.


Aircraft ready for structural repair. Note the top shear line through the screw holes where the support structure failed.


Aircraft after the windshield was replaced for one-time flight back to base. Note the heavy use of speed tape.

Trust Your Training

By Lt. Alex Winkelman

FLEET AIR RECONNAISSANCE SQUADRON (VQ) 1
WORLD WATCHERS

Flying one of the Navy's oldest active service aircraft comes with some complexities that you can't always train for. I feel great admiration for the opportunity to fly such a tried-and-true platform. As all Navy pilots can attest, you need to systematically understand how the platform works so that when you encounter malfunctions or abnormalities that may be outside of your typical Naval Air Training and Operating Procedures Standardization (NATOPS) procedures, you have the confidence to press on and find a solution to get everyone back on the deck safely. This deep understanding is a skill that is increasingly critical in the aging P-3 community.

A recent example of this that I experienced was on a mission flight out of Souda Bay, Greece. Shortly after arriving to our operational area, our flight engineer noted oil pressure fluctuations in our No. 1 and No. 2 engines. Fluctuations within this section of each engine are limited to +/-5 pounds per square inch (psi); they were within limits (2-3 psi fluctuations) but abnormal. Our flight engineer shifted his focus to monitoring the engines for a period of 20 minutes, where the fluctuations were continuous but within limits. A conversation was started in the flight station about the possibility of the fluctuations being derived from corrosion or water on the connections for the gauges. The aircraft previously had a faulty gauge in the vicinity of the oil pressure gauges that was a result of corrosion.

While this discussion was taking place, a 5-psi fluctuation was noted in the No. 1 engine. The decision was made to disconnect the No. 2 oil pressure gauge to maintain situational awareness of No. 1 and check for corrosion on No. 2. Upon disconnecting No. 2's gauge, corrosion was noted on the surfaces and pins of the cannon plug connections. We decided to reconnect the gauge and take the suspected corroded gauges, clean off the corrosion with what we had available and swap them with known good gauges to get more accurate readings of what was happening within our oil system.

Once all the gauges were set, they were monitored and no abnormal indications occurred for a 10-minute period. The decision was made to return to base due to the suspected unreliability of the gauges due to corrosion.

We planned to hold at the approach fix servicing our landing airfield to burn down to an appropriate landing weight. While in the short transit back to the airfield, a 12-psi fluctuation was called out in the No. 1 engine. Due to this being well outside of our operational limitations and the P-3s incredible capability to fly in a three-engine configuration, the engine was shut down and we declared an emergency. Our intentions remained the same – to hold and burn down below our max landing weight – but as we arrived at the fix supporting the active approach onto the runway, our flight engineer called out oil pressure fluctuations in both sections of all three remaining online engines. The P-3 has four engines, and each engine has four gauges reading oil pressure in the power and reduction gear sections. Engine No. 1 was already shut down and every other oil pressure gauge for the remaining engines started to fluctuate. This included fluctuations out of limitations for our No. 4 engine.

As you can expect, this was not a fun realization and the focus immediately switched to getting the aircraft on deck as soon as possible before the degradation increased. Due to the proximity of the airfield and the likelihood there wasn't actual system degradation – just corrosion – we brought the aircraft in for a heavy weight three-engine landing. The landing was uneventful and the plane was returned to its parking spot without incident. Maintenance found corrosion on all eight oil pressure gauges, as well as a bad oil pressure transmitter on the No. 1 engine. The connections were all cleaned of any corrosion and the aircraft was returned to service.

VQ-1 is my first sea tour and my detachment in Souda Bay was my first opportunity signing for the aircraft with a full mission crew. I have faced malfunctions that have made our flight station think outside of the box and systematically get an understanding of what is going on when NATOPS doesn't have a direct answer for us. The training I have received and the situations the P-3 has presented us with, have instilled a confidence in my capabilities that is invaluable. Some of the most basic principles we are taught in flight school forever allow us to accomplish our mission. Speak up about any and all abnormalities, enforce crew resource management and risk management principles in all aspects of flight and use all your resources to find a safe way back onto the ground. ✈

An EP-3E Orion assigned to the "World Watchers" of Fleet Air Reconnaissance Squadron One (VQ-1) on runway in Souda Bay, Greece on June 17, 2016. (U.S. Navy Photo by Heather Judkins)

BLIND OVER THE BALTIC

By Lt. Nathan Wray

HELICOPTER MARITIME STRIKE SQUADRON (HSM) 79

THE GRIFFINS

Landing on the back of a ship is the one true thing that distinguishes naval aviators from other military pilots around the world. For those of us in the Rotary-Wing community, doing so safely, especially at night, requires several pieces of key equipment, to include an operable radar altimeter (RADALT). Most fixed-wing pilots are familiar with RADALT being used mostly for callouts during approach and landing.

Due to limited weather updates as independent deployers and the reliability of surface barometric readings, many outside our community, might not realize the extent to which RADALT is used over barometric altimeter (BARALT). For helicopter pilots, it is the most reliable altitude indication underway.

Our flight was scheduled for four hours of total flight time. Following our brief, we made a quick glance outside (while it was still light out) and estimated the weather to be a fairly solid ceiling of 800 feet, with occasional puffs of clouds down to 600 feet from which shafts of dense rain made their way to the Baltic Sea. We hot seated the aircraft from the previous crew and launched from the ship into the night. It was dark. Very dark. During the Fall and Winter, the Baltic becomes pitch black very quickly after sunset.

Shortly after launch, a quick glance out my window revealed the position lights illuminating lines of heavy rain streaking past the aircraft as we climbed away from the ship. We stuck to our instruments and night vision devices, and trusted them to get us to an area of better visibility as we combed the Baltic for surface contacts. Even with the hair-raising weather, the long hours of identifying contacts can lead to a monotony that only those who have done it can attest to.

After being airborne for three and a half hours and almost 40 miles away from the ship, that exact monotony was setting in. Imaging contact after contact, managing airspace and attempts to find any more conversation topics were all beginning to prove futile. Suddenly, the distinctive, shrill tone of our decision height (DH) bug filled our helmets. Subconsciously, my brain had already been trained on what to do. I immediately looked for my vertical speed indicator (VSI). Were we in an unrecognized descent? No. We had already established that the aircraft was straight and level with no descent rate, and a quick glance immediately below the VSI revealed the problem: our RADALT had failed.

We first made sure that the aircraft was under control. The MH-60R Sea Hawk helicopter is designed to automatically ‘kick over’ to BARALT hold in the event of RADALT failure, and our aircraft did exactly that. We tried to re-engage the RADALT hold function, but to no avail. There were no circuit breakers to reset and there were not any computer managed instructions (CMI) for this emergency, so the next step was to break out the pocket checklist.

To our surprise, the checklist simply told us to “Note Condition.” Well, we had certainly done that. Given that we had about an hour left of fuel and were 30 minutes from the ship, we made the decision to head home.

As we pushed back toward the ship, we began the operational risk management process. There were two main hazards identified. For one, the weather was no better than when we had departed almost four hours prior. The other hazard was now the center of our attention. Without a RADALT, our precise altitude, especially at the lower, more ocean-intimate altitudes required for a shipboard landing to a Destroyer with a flight deck just 14 feet above the water, wasn’t truly known. The unknown creates a risk of Controlled Flight Into Terrain.

In Naval Aviation we discuss risk in terms of severity and probability. In this case, the severity was obviously large. Impacting the water due to inaccurate altitude information would result in the loss of the aircraft, at a minimum. It was our job to put mitigations in place to minimize the probability of a hypothetical risk becoming a reality.

We turned back toward the ship and informed the anti-submarine/anti-surface warfare tactical air controller (ASTAC) of what was going on. The ASTAC informed us that they were setting flight quarters and were going to turn the ship into the wind. When putting in place mitigations, it's important to understand conceptually how relying on BARALT versus RADALT can be different.

If you consider the fact that BARALT settings can vary small amounts between points in space in a particular area, you can understand why we didn't fully trust our BARALT here. In flight school, pilots alike are taught that for every hundredth decimal (.01) of inches of mercury (inHg) you increase or decrease your altimeter setting, the altimeter reading will increase or decrease by 10 feet. So, if you have an altimeter setting of 30.00 inHg twisted in, but the true altimeter setting for that point in space is 30.08, you are actually 80 feet lower than your BARALT reads. At normal altitudes above 1,000 feet that 80 feet of error is rather insignificant. But during a dark, low visibility approach to the back of a small ship, those 80 feet can be the difference between a safe flight deck landing and impacting the water.

As we got closer to the ship, we decided that it would be best to first slow down and then gradually step down our altitude until we felt comfortable with our BARALT setting. We finally found a pocket of visual meteorological conditions and took advantage of it to execute a modified version of the Naval Air Training and Operating Procedures Standardization program night/instrument meteorological conditions descent over water procedure to descend using BARALT to 200' mean sea level. Just as suddenly as it had cleared, just a couple of miles from the ship, rain shafts in the area began reducing the visibility even further.

For previous flights, the ship's bridge team had been calculating altimeter settings and passing them to us before launch and recovery. But these settings were often not quite as accurate as our aircraft's BARALT Sync function. BARALT sync is used by MH-60R crews over water to apply an altimeter setting that makes our BARALT setting match our RADALT setting at that particular point in space. However, without an operable RADALT, the feature does not work.

Knowing it wasn't working, we went over how we would utilize crew resource management (CRM) to optimize each crew member's function during the approach and mitigate our altitude issue. The sensor operator (SO) would 'find' the ship on forward-looking infrared (FLIR) and keep the camera locked on to it. The pilot at controls would fly the ship's TACAN approach down to minimums (200 feet AGL and one-half mile visibility) until we sighted the ship and then began the descent.

I, as the pilot not at controls, would provide distance callouts and BARALT callouts (normally made off of RADALT). We decided that below 100 feet, we couldn't trust the BARALT setting and decided that the altitude callouts would stop there to avoid confusion. At this point, we would need to have an adequate visual of the ship to ensure that we could judge our altitude visually.

As we rolled onto a downwind, the ship came into view on the FLIR like a ghost, barely visible through the poor weather conditions. In order to give ourselves adequate space for a stable final approach, we extended our downwind a bit, but due to a blind spot on the FLIR from the aircraft's fuselage, we lost sight of the ship. Losing sight made the hairs on the back of our necks stand up. We had been able to see the ship at one mile earlier, but what if the ship drives into an area of even worse visibility during our downwind, thus making it no longer visible?

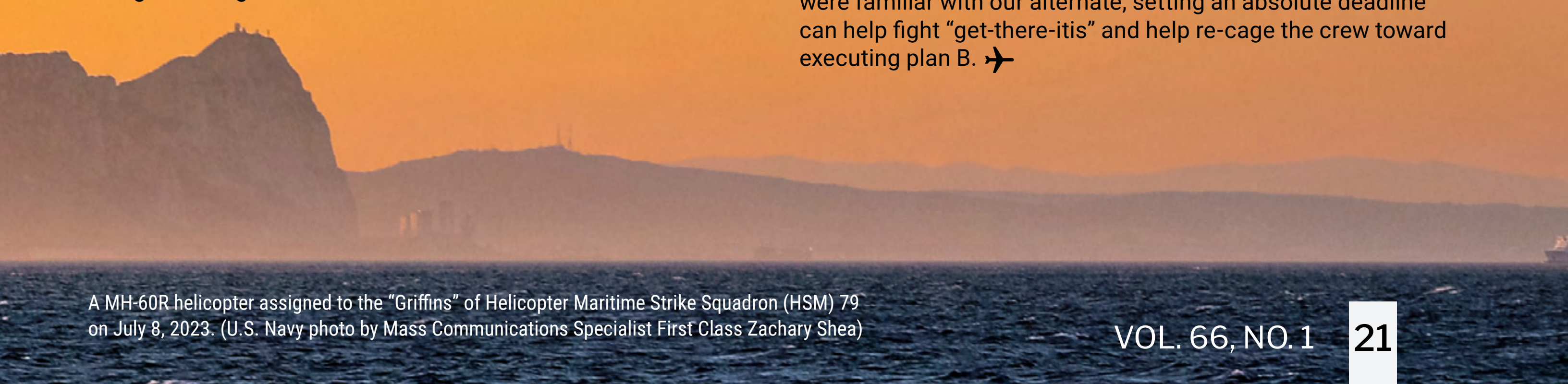
Throughout all flights on our patrol, we had gotten into the healthy habit of always knowing what our nearest divert airfield would be. Fortunately for us, it was not very difficult in the comparatively tiny Baltic Sea. Our nearest divert field was located in Gdansk, Poland, just over 40 miles away, and was an airfield field at which we were quite familiar with. By our calculations, it would take roughly 20 minutes to get there. We factored in additional fuel for an approach if the weather was poor at the airport. With approximately 45 minutes of usable fuel remaining, we had enough fuel for one, maybe two approaches to the ship before we needed to turn to our divert.

With those considerations in mind, we turned onto final approach toward the back of the ship. It was a tense few seconds of waiting that felt like a few minutes. And then, just like the first time we spotted it, the faint outlines of the back of the ship gradually began to distinguish themselves on the FLIR video from the rest of the gray nothingness. After a few more seconds, the ship became visible on our NVDs. We were just three-quarters of a mile away. Even though we could see the ship, we still couldn't see the surface of the pitch-black Baltic Sea. We began our descent per usual at a half-mile from the ship. Below 100 feet, I stopped giving BARALT callouts, just in case our altimeter setting was inaccurate. As we slowed the aircraft down, the closure rate callouts from the SO helped ensure that we did not get too slow, which can lead to what is known as the "black hole" effect, a form of spatial disorientation that occurs at low altitudes over water at night when aircrews visually fixate on the ship instead of their instruments.

With the black hole in mind, we crept toward the back of the ship at a slow but steady rate of descent. After a tense few moments of finding our position over the rapid securing device over the flight deck, we landed the aircraft. We sat there for a second to let reality sink in. After we were secured to the deck in chocks and chains, all three of us simultaneously breathed a sigh of relief over the incident command system and began the process of shutting the aircraft down.

Upon debrief, we discussed some of the things we had done well and some of the things we could have done better. Firstly, we realized that the GPS altitude readout on our displays in the back had been quite accurate and along with an altitude readout off of the ship's SPY-1D (Search Protect, Yellow 1) air search radar system, provided viable backups to what we were seeing on our BARALT. Secondly, we were quite satisfied with our ability to remain calm. Remaining calm is an unwritten part of every emergency that really should be the first step in dealing with any problem in an aircraft. If you can train your brain as an aviator to remain calm, you can open up your mind to clearer channels of thinking that can enhance decision making, maximize CRM and minimize errors in judgment and flight discipline.

Ultimately the cause of the RADALT failure was found to be water intrusion into the RADALT's receiver/transmitter, which caused electrical problems that led to the RADALT shutting itself off. During our debrief, we realized that we had never set an absolute deadline for proceeding to our alternate and verbalized it to the crew. While we had our fuel calculations completed and were familiar with our alternate, setting an absolute deadline can help fight "get-there-itis" and help re-cage the crew toward executing plan B. ✈



A MH-60R helicopter assigned to the "Griffins" of Helicopter Maritime Strike Squadron (HSM) 79 on July 8, 2023. (U.S. Navy photo by Mass Communications Specialist First Class Zachary Shea)

STRAP IN!

By Aaron Hutchinson

SENIOR CHIEF NAVAL AIRCREWMAN

Safety stands as the cornerstone of every mission. Among the critical components ensuring crew safety, the proper use of safety harnesses plays a pivotal role. Unfortunately, data analysis received from mishaps and findings from Naval Safety Command local area assessments (LAA) has identified that the rotary wing community appears to have a negative trend for properly using safety harnesses resulting in crew member injury and death. This trend places aviators at increased risk and, if not corrected, will continue to degrade the operational effectiveness of our flight crews.

At a fundamental level, understanding a safety harness' role is vital to ensuring crew safety. Safety harnesses fall into different categories, such as seat restraints and crewman safety belts, also known as gunners' belts. The purpose of the safety harness' design is to secure crew members within the aircraft's cabin or cockpit, ensuring their safety during flight, maneuvers and possible emergencies. With the wide range of rotary wing aircraft, including the numerous H-60, H-53, V-22 and H-1 variants, a crew member's position and mission will normally dictate which safety harness is used. Adhering to the fundamental principles guiding proper harness use is paramount to mitigate risks associated with injury or even death, while maximizing crew performance and mission success.

Mission necessity and operational requirements are key considerations every time an aircrew member straps into the aircraft, as every rotary wing mission carries its own set of operational requirements. Simply put, assess the risk versus reward. Safety harnesses are more than just restraints. If securely fastened, safety harnesses are tools enabling crew members to perform their duties effectively and focus on their tasks during maneuvers or unexpected turbulence in the aircraft. Enhanced situational awareness leads to safer and more successful mission outcomes.

Naval Air Training and Operating Procedures Standardization (NATOPS) and standard operating procedures (SOPs) are built on hard lessons learned and provide aircrews an established standard that plays a pivotal role in setting guidelines for rotary wing operations. While there's always the ability to deviate from NATOPS and SOPs, the deviation shouldn't be the standard. Using safety harnesses properly is an integral part of the procedures. Procedures identified in these publications dictate the correct method of donning and securing harnesses before takeoff and landing, as well as during flight, while providing additional guidance for when it's appropriate to use a crewman safety belt in place of a seat restraint. Adhering to NATOPS and SOPs ensures a consistent approach to safety across all missions and aircraft types.

While aviators brief and plan for numerous contingencies, including emergencies and ditching scenarios, crashing isn't something aircrews anticipate happening on any given flight, however, it can and does happen. Ensuring your aircraft's crash-worthiness and crews' survivability is extremely important and is one of the foremost reasons for employing proper safety harnesses use, which helps improve outcomes during adverse situations. In addition to using the appropriate safety harness, having a properly fitting harness is equally important. A well-fitted harness restricts excessive movement of crew members in case of sudden impacts or crashes, thereby reducing the chances of severe injuries. A well-fitted harness holds particular importance in military operations where aircraft exposure to hostile environments or extreme conditions exists.

The ability to egress and escape is another factor to consider when using a safety harness. If an emergency occurs, quick egress from the aircraft can be the difference between life and death. Safety harnesses are designed to allow for rapid exit during critical situations, but again, only if worn correctly. The harnesses are equipped with quick-release mechanisms enabling crew members to free themselves swiftly, facilitating a faster evacuation process. This aspect becomes particularly relevant when considering the potential dangers associated with over-water ditching scenarios or fires.

Crew safety harness use in the rotary wing community isn't just a formality but also a crucial aspect of operational readiness and crew well-being. As aircraft and missions evolve, so do the risks associated. By employing harnesses effectively, aircrew members enhance the likelihood of minimizing injuries, fatalities and mission failures. In the ever-changing landscape of rotary wing operations, the commitment to safety remains unwavering. Safety harnesses stand as a symbol of that commitment, providing a tangible measure to secure the lives of those who take to the skies to accomplish vital missions. Through crash-worthiness ratings, mission necessity, egress capabilities and adherence to established procedures, the rotary wing community ensures the skies remain both daring and safe. ✈

Senior Chief Naval Aircrewman (Helicopter) Aaron Hutchinson provides surveillance for a search, air and rescue during a Savage Ice exercise over the George Washington National Forest, Virginia, June13, 2019. (U.S. Navy photo by Mass Communication Specialist 3rd Class Trey Hutcheson)

BAD AFTER BAD

By LT Brad Johnson

Carrier Air Wing (CVW) 17

There we were, executing a routine airborne electronic attack (AEA) training flight as a division in the working area. I had briefed the division of four single center line configured Growlers at the Fleet Replacement Squadron (FRS) on Whidbey Island, Washington. During the Risk Management (RM) portion of the brief I had called out weather as the primary risk that we were going to have to deal with and decided to set the BINGO an extra 500 pounds above normal recovery fuel. I indented to give us some slop in the event that we had to shoot an approach back at home field. "We can push the weather, but let's not push the gas" is what I said to help the division mitigate the risk of changing weather. The crews for all four aircraft had a standard crew lineup for the FRS with an instructor pilot and a student naval flight officer (NFO) in the lead jet and a student pilot with an instructor NFO in the dash two position. The plan was to launch as two separate sections, recover as two separate sections and execute conduct in the electronic warfare range as coordinated singles. As a flight toward the end of the Growler FRS syllabus, the event called for the student pilots to lead a section back from the event for the overhead recovery. So, I briefed that if we had the weather we would have the students lead both sections back and if we didn't have the weather to do so we would have the instructor pilot lead us back for a section precision approach radar (PAR) with a speed split on final. The section speed split on final is a relatively standard procedure at Whidbey for when the break is closed but the weather is still better than circling minimums.

My section had a relatively smooth, on time departure, and while there were some layers that made the break questionable when we took off, we definitely had the weather to support the PAR section speed split on final. On our climb out we penetrated several cloud layers and experienced some relatively turbulent conditions while flying in parade formation on the way up to our filed altitude of 16,000 feet. Once out to the electronic warfare range we had great weather for the event conduct, while flying up at 28,000 feet, along the Washington coast just outside Olympic National Park. I even remember saying to my student, "Man, it's a really nice day to be out here flying today." I noticed after our first run during Ops and G checks that we're about a thousand pounds below lead and cued into the fact my student was flying a faster tactical airspeed than was necessary for the conduct. I had him set a speed closer to max endurance, to give us more gas and training time in the range.

We got all our conduct done and started working a join on lead with a few hundred pounds above our briefed BINGO state of 5,500 pounds. At this point in the flight I was feeling good, our section had two up jets, we took off on time, my student had performed above average and we made good use of our range time and were headed home for an on-time landing, which was good because I knew maintenance was using our aircraft for another flight later that day. Right before the fence out, I was coaching the student through the procedure of checking automatic terminal information service (ATIS) using our communications countermeasures set as opposed to our VHF/UHF radio. The signal came in broken and we couldn't hear everything but we were able to copy that they were landing runway 14 and that the break was closed. We relayed that to lead and started working the join up for the return to base (RTB). When lead went to check us out of the area with Downrigger (entity of Whidbey Approach that controls entry and exit to the working area) comms were unheard so as dash two NFO I talked to Downrigger and got us cleared out of the area for a standard instrument flight rules return. At this time Downrigger also passed us current ATIS for the field (a standard practice at Whidbey). They passed that the field was landing runway 14, break was closed and a ceiling of 200 as well as a few other broken layers. I came back and said, "Confirm broken two hundred?," to which he replied "Broken two thousand." This is an important distinction because if weather back at the field was indeed that bad we would have done several things differently during the return transit, to include coming back as singles for the PAR, which would have allowed us to use a precision approach and go all the way down to 200 feet before discontinuing the approach. As it was, the field calling 2,000 feet broken was about what we expected, and we had a game plan to deal with it. The transit back to Whidbey from the working area is about 15 minutes so we had no reason to expect that the weather would change drastically from what ATIS was calling.

We entered the clouds at about 9,000 feet and lead had us take one nautical mile radar trail for the penetration portion of the RTB because the turbulence flying through layers in parade on the way out was unpleasant and he didn't want to drag us through that. The plan was that we would get to parade in clear air before commencing the section PAR speed split on final. During the return I started setting up the navigation for the instrument carrier landing system (ICLS), which is only available on runway 14 and only available for local area Growlers as it is not published in the FLIP (Flight Information Publication). It is also the only self-contained precision approach available to Growlers at Whidbey. I started to set this up only as a back up to the PAR that we were about to shoot, but just as I started to set up the ICLS, approach control switched the active runway from 14 to 25. Had I known how bad the weather was getting at home field I would have used this time to listen to ATIS at our divert field of Paine Field in Everett, Washington, but since I still expeced to show up at the field and had broken ceilings at 2,000 feet, the thought never even crossed my mind.

When we were about halfway home and approach descended us to 6,000 feet we had been flying 100% IMC since we entered the clouds and it seemed unlikely that we were going to find the clear air to join up before the approach. With this new obstacle, the instructor pilot in lead and I elected to change the approach request to the "Red Dog" RNAV runway 25, a radar trail approach on the RNAV where vectors are given to lead and the wingman maintains 1.0-1.5 nautical miles in trail and flies their own approach in trail with the same airspeed and configuration as the lead aircraft. As we descended to 3,000 feet and started getting vectored around the field for the approach we were still in 100% IMC conditions, our jet had drifted to a 2 mile trail versus a 1.5 mile trail; while not a major deviation I asked my student to close the gap and make up

EA-18G Growlers fly over Naval Air Station (NAS) Whidbey Island, Washington on April 22, 2023. (U.S. Navy photo by Mass Communication Specialist 3rd Class Jacquelin Frost.) Background: Naval Air Station Whidbey Island, Wash. (Illustration of an U.S. Navy photo by Mass Communication Specialist 3rd Class Jacquelin Frost) a little distance during the turn to final. As we started the descent and passed the final approach fix, I set the radar altimeter (RADALT) to 500 feet for an approach that had a minimum descent altitude of 620 mean sea level (592 above ground level) and told my student if the RADALT went off or we go missed that we'll be going somewhere else and that I'll have Paine Field ready to go. Looking back, I think I said this because I was really starting to doubt the weather report we received earlier that was calling for a ceiling at 2,000 feet.

As we reached 1,000 feet on the descent and was still in the clouds, our lead let us know that they were going missed and we heard them talking to approach about executing their missed approach instructions. My pilot asked if we should discontinue our approach to which I told him we should continue to the minimum altitude before going missed ourselves.

At about 800 feet on the approach we entered a patch of clear air and could see some patches of the surface to include parts of the airfield but the entire approach end of the runway was completely obscured by a wall of clouds that were dumping heavy rain.

At about 700 feet, knowing he couldn't fly through the clouds my student elected to follow lead and execute our missed approach instructions. These missed approach instructions is where I made the first poor judgment call of the day. With 3,000 pounds of gas remaining and having just executed a missed approach, I should have just told approach we were proceeding direct to our divert, Paine Field, but I delayed that decision as the lead instructor pilot talked to approach about trying the PAR to runway 25 or attempting the PAR to runway 14 which did seem to make sense having just flown over the field and seeing the approach end of runway 14.

Not knowing if the weather was any better at our divert, and knowing that we got nowhere near precision mins on our last approach, I elected to ask for a short hook to shoot the PAR to runway 25 and solicit more information from approach about the conditions at the field and if anyone else was recently able to land on 25 with the PAR. At this time, we were using a discreet frequency with approach and our current controller was having a hard time figuring out if anyone else had made a successful landing, but they were finally able to tell us that someone had shot the PAR and executed a missed approach.

If I had higher situational awareness (SA), I would have realized that the jet that had executed a missed approach on the PAR was our dash three and if we were still up the same tac frequency he would have told us that he was pretty confident we would break out on the next attempt. Unfortunately, he was never able to pass that data and we never got that much-needed SA. Of note, the radios at this time were pretty clobbered and a Growler from another squadron was also trying to land about this time. After we decided to try the PAR runway 25 and asked for a short hook, I declared min fuel and approach was giving us relatively short vectors so by the time we were able to get the controller to tell us that someone had executed a missed approach on the PAR we were already on a base leg in the ground-controlled approach (GCA) pattern and coincidentally pointed right at our divert, Paine Field. So we told approach we were diverting to Paine and over the past minute or two I furiously tried to find the approach plate for Paine in the FLIP so I could tune up their ATIS and know what our chances were over there.

Now the next thing I'm about to say may seem academic and a little silly but it caused me issues, so I'll share it now. We've largely moved away from using digital pubs at the Growler FRS for security reasons and I have almost always used paper pubs so that wasn't new, but the FLIP volume that covered Whidbey, that I've used for years, used to only cover Washington and Oregon, but it was recently reorganized to cover Washington, Oregon, Montana, Idaho and Wyoming. So, it's a bigger book and Paine approaches are not where they used to be. Now if I had been like my more-prepared students I would have had all my diverts book marked, but on this day I did not, and it cost me valuable brain cells and time I did not have to spare. Another silly thing that was giving me issues about this time is I started pushing on the left rudder every time I wanted to talk to ATC. Now anybody outside the F/A-18 community might be wondering why the NFO was pushing the left rudder and people inside the F/A-18 community are probably wondering why there's even a rudder pedal in the back seat to begin with. Normally the back seat of a Growler just has foot rests with foot buttons to key radios, but that day we were in a trainer-configured jet and instead of my normal weapons system hand controls and foot pedals, I had a stick, rudders and throttle, and while I've had dozens of flights in an aircraft like this, it was not the norm and my normal memory was taking over as I had fewer and fewer brain cells to work with. After deciding to go to Paine it was time to get some new navigation set up, so I turned to my area navigation (RNAV) system and, not wanting to spend precious time typing the airfield in, I went to the nearest function where Paine is the third one down and jammed the "DRCT TO" button. Normally the system would ask if I wanted the RNAV approach or just the airport, but instead of this insightful query, the system came back and said "RNAV DATABASE CORRUPTED," not accepting this answer I proceeded to enter the airport code manually to pull up the airfield and the system came back, "RNAV DATABASE CORRUPTED." About this time approach directed us to switch to Seattle approach, which controlled approaches for Paine and passed us a frequency. I tossed the frequency in the primary radio but never checked in. I was pretty collected and professional in the aircraft up until this point, but with not enough gas to get to my secondary divert where I could shoot a tactical air navigation (TACAN) system approach and no approach available at my primary divert, I started to lose my composure. As my confidence began to wane, I think it had a negative impact on my student, who reminded me there were no other approaches at Paine and it was time to head back to Whidbey and attempt the PAR.

In the aircraft that day the time period from deciding to divert to deciding to go back to Whidbey seemed like an eternity as I fought with the FLIP and the RNAV system and our options and gas grew slim, but in reality we had only traveled 13 miles and were roughly just as far away from Whidbey as we were from Paine. In fact, all that drama had happened in such a short period of time that our lead (who had let us take the short hook while they took the full GCA pattern and had an extra 1,000 pounds of gas on us) was just now turning on final for their first PAR to runway 25. Of course, we didn't know this because we were on a discreet frequency with approach and our SA bubble had shrunk to the size of our helmets. We were at about 2,300 pounds of gas at this time and the "FUEL LO" warnings were starting to fill our heads. I switched back to Whidbey approach, declared emergency fuel and my pilot turned around. I asked for the PAR and they quickly got us on a vector.

Here's where I made a decision that would not help the situation and also endangered ourselves and the aircrew in the lead jet. Being in a fuel emergency and grasping for ways to get us home safely, I pulled up the fuel page which was always doing fuel calculations and directed my student to set a max range speed of Mach .54. The thought being that we would save a little gas by getting to the most efficient speed. The problem with this was that at 3,000 feet, Mach .54 was roughly 315 knots. In my head at the time I thought we had been flying away from the Whidbey aerodrome for some time, but in reality we were only 15 miles away. At 315 knots with only 15 miles to go, we would be on top of the field in less than three minutes and that's exactly what happened. Not only was this poor head work, but it was so fast that the approach controller was never able to pick us up on

glide slope and it severely compressed his timeline to set us up for the approach and potentially more lethally deconflict our flight path with lead who was slowing to approach speed. About that time I put in the waypoint for the runway and gave my pilot a course line, he realized that we were way too high and close to the field. Instead of telling him to slow down, I asked approach for a descent to which they cleared us to start our descent and my pilot maneuvered aggressively to get us on glideslope.

Now, you may wonder what our SA to lead was and after watching our tapes I can tell you that it should have been high, we still had air to air to TACAN ranging off them and would be in Link 16, so their exact location relative to us was clearly on the display that was in front of me, but I wasn't looking at that. I was thinking about the gas and locked on everything the PAR controller was saying and making sure my pilot was complying with their instructions. Of note, at this point were still faster than 300 knots and not configured for landing. At about three miles from the field the radar supervisor came over the radio and informed us the approach was being downgraded from a PAR to an approach surveillance radar and called traffic off our nose. That traffic was lead, they were flying on speed on short final and we flew over them at 300 knots and missed them by about 340 feet. Fortunately, just as they called traffic I looked outside the aircraft, saw lead's jet, saw the field and told approach we were going to take it around.

Now you may be asking, why didn't I tell the pilot we were high and fast and late to configure? The only answer I can provide is that in the three minutes between declaring an emergency and over flying lead, I had a breakdown of my basic priorities to Aviate, Navigate, Communicate and Checklist. My SA was crushed by thoughts of fuel, the FUEL LO warnings on the incident command system, the rain beating on the canopy and the fact that we had been flying in the clouds for at least the last 20 minutes.

At this point as we were proceeding upwind on our go around, we were very lucky that we could see the field and had avoided a midair collision with our lead but we still had to land the jet and we were still at 300 knots. I decided that tower downwind was the best option for us. I told approach and then switched to tower and told them we were in a right downwind turn for the tower pattern. About this time my SA bubble grew a little with the field in sight and I was finally able to give my student some much needed back up on the aviate side of the house.

I had made some questionable decisions up until this point and now it was my student's turn. He went right for the cross wind turn which is as nonstandard at Whidbey as it is at any Navy airfield. We reached pattern altitude at 1,000 feet and had visual of the field but at our current speed it was as if we had just came out of right hand and break, which was also nonstandard.

During the debrief I think we identified why my pilot opted to go right; he thought approach had been vectoring traffic away from us to the south. He quickly realized that the tower pattern was the correct choice, but he was not in the right headspace or parameters to land the jet. On the downwind we finally slowed below 250 knots, got the aircraft configured and ran through some landing checks.

Unfortunately, we were still a little high and we started our approach turn before we even got to the abeam. We would be cleared to land but would be looking at a very wet runway and the only way we were going to land without a big play for the runway would be to touch down halfway down the runway, so we collectively decided to go around. This time I had him go left and got him back to a runway sight picture that he was familiar with.

Getting there was still pretty hairy; as he went around he didn't really get a good climb away from the ground and at about 300 feet we did the short pattern and overflew the flight line at about 300 feet AGL. We climbed to about 650 feet (still 350 feet below tower pattern). If that doesn't sound crazy, I'll tell you that there was rising terrain under this portion of the tower pattern so we were really only at about 300-400 feet AGL when we started the approach turn. The good news is we were at on speed and at the 180, so we were just low, I gave him a couple altitude and airspeed calls, we saw a ball on the lens for the first time that night and then just before we touched down, the jet's terrain avoidance warning system told us to "Pull up, Pull up".

I thought to myself, "Don't tell me the gear isn't down." I looked left, saw three green lights telling me the gear was down and locked and then my student told me, "We're good" and I kept my mouth shut and he landed the aircraft on center line and we had good braking action despite the heavy rain on the runway. We landed with 1,700 pounds of gas, and I talked to base for the first time that night and told them the aircraft was bravo (partially mission capable) for an MU CAUTION we got on landing. Those investigating this incident later pointed to the MU CAUTION (a mission card-related problem) as the likely cause for the RNAV not working when needed.

The student and I reviewed the tapes and we flew a similar scenario in the sim later that week. The biggest mistake we made that day was increasing speed to max range of 315 knots. The most efficient speed would have been 267 and with the short distance to the field the standard 250 knots would have been safe and efficient. That slower speed would have given approach more time to keep us separated and set us up for a safe approach and we would have landed with approximately a 2.0. The biggest learning point is you should always be prepared to go missed approach and execute a bingo profile regardless of what ATIS is calling.

CORRECTING VISION

By Lt. Cmdr. Karl Petracek & Lt. Ryan Speir

PATROL SQUADRON (VP) 26
THE TRIDENTS

A routine night landing for a Navy patrol squadron turned into a dangerous encounter, highlighting the limitations of standard laser eye protection and the need for improved training and equipment.

The Tridents of Patrol Squadron TWO SIX were conducting a repositioning flight of a P-8A with a planned stop at Clark International Airport (RPLC) in the Philippines at night. Clark is known in our community for lasing incidents, so we donned our provided laser eye protection (LEP) before entering the terminal area with the plan to remove them once established on the final approach course.

Since it was a night landing, we had our display brightness down, lighting rigged to see outside, and we had good visual reference outside. On radar vectors to final, we saw a flash of green laser light across the cockpit. It was not more than a bright green light, like bright highway lights in the opposite direction. At the time, we discussed if anyone was impacted, found that no one had been hit directly and proceeded to make a routine landing. Fortunately for all involved that time, the laser illumination was brief and indirect. The illumination was bright, but none of us had seen it except as a bright flicker of green across our cockpit surfaces that had been darkened for the night landing.

Lasing incidents at Clark International Airport are a known hazard, as they are in many places around the world. Dazzling aircraft with lasers, though illegal, has become a frequent problem. Most common are red and green lasers, easily obtained in shops or online. Even lasers well beyond the legal maximum power are available, allowing a single bad actor to render the skies a dangerous place to operate. It takes only a single hit on unprotected eyes to damage vision. We were lucky this time. Laser illumination is instantaneous and damage occurs faster than the human eye can react. Worse, if the LEP does not protect against the wavelength, it is as bad as staring at the sun through sunglasses. The seared-in dazzle spot will dance across vision, blocking and distracting with potentially blinding effects. In our case, the bright flash against a darkened cockpit was enough to distract but not enough to prevent us from making a safe landing.

At night, when eyes are adapted to maximize available light, a direct hit can damage the retina. Indirect hits like the one we experienced create their own hazard, crushing darkness adaptation and blinding as effectively as turning on a bright spotlight. At night, when air traffic is only visible as dim flickers in the dark, loss of darkness adaptation can mean losing all visual separation from other air traffic. Loss of this visual separation is especially hazardous in the terminal environment when not only other air traffic but the airfield environment may be lost in the glare. Since lining the windows of the aircraft with permanent laser opaque material would cause its own safety hazard, the only workable solution is for the flight crew to wear LEP when there is a risk of lasing.

Little did we know that the LEP we were wearing was not rated to protect us against the laser we had witnessed. Only afterward when we discussed the matter with our squadron safety department did we find an investigation ongoing into our current LEP. About the same time as our incident, it was discovered that our LEP would provide no protection. What follows is our summary of findings for the benefit of the community.

Across aviation, the threat posed by laser use ranges from planned firing range events to illegal blinding with commercial grade lasers. Most pilots and aircrew within the community wear some kind of LEP at various times, but the nature of the protection is theoretical to them at best. "Wear LEP; don't get hurt by lasers," is the extent of most knowledge on the subject. However, LEP is not so simple and failure to plan for real threats will leave crews exposed and unprotected.

LEP operates on the principle of optical density, where the lens blocks or reflects select wavelengths of light. Lasers, being tightly regulated light, are selectively blocked by lenses designed for that wavelength. In the past, it has been difficult to engineer a lens which both blocks the dangerous wavelengths while allowing sufficient light through to see the cockpit environment and terminal area.

As a compromise, LEP was designed to block certain bands while being transparent to others. For this reason, LEP designed for IR lasers (designators, targeting pods, etc.) could not protect against green or blue lasers and LEP designed against green or blue lasers had limited protection against red and infared lasers. As a general rule, red LEP protects against green lasers and green LEP protects against IR lasers. This compromise resulted in crews carrying different LEP for different environments, which resulted in crews using the wrong LEP in a darkened cockpit environment.

PROPER PROTECTION FOR LASER THREATS

We can speak from experience that, in the terminal environment with the cockpit lights turned down to see outside, color vision is the first to go. If we were relying on the color of the lens to tell us which LEP to wear, we would guess wrong. The only way to clearly differentiate would be either to shape code the LEP with different models or better still to color the frame with bright white paint. Even with maximum coding, LEP use is not the priority in the terminal area when the crew is busy moving the aircraft in and out of congested airspace close to the ground. Junior personnel too may cause the incorrect LEP to be used, passing the wrong set to an otherwise occupied pilot.

In a worse case, crews equipped with only one set of LEP may, and as we did, falsely believe that the LEP they carried and used would protect them against a real threat, only to discover afterward the lenses were only rated for IR lasers and functionally transparent to the green lasers used on them.

To determine what lasers the issued LEP protects against, it is necessary to refer to the Naval Air Training and Operating Procedures Standardization Manual and confirm the optical density meets the required values. It is also a best practice to clearly mark for aircrew what laser threat the LEP is suitable for, ideally in white reflective paint so that it can be seen in low light conditions.

All squadrons and all aircrew who use and rely on LEP for protection should be briefed at indoctrination and during their annual laser safety refresher about the LEP they are issued and what it is designed to protect against. Not all lasers are the same and not all LEP is the same.

As LEP technology improves, so-called tri-band LEP has emerged on the market, which can protect against all expected threats. This one-size LEP solution will solve the problem of multiple LEP lenses and ensure all crews are at all times protected against an increasingly dazzling world.

The encounter of the Tridents of Patrol Squadron TWO SIX serves as a reminder of the unpredictability of laser threats in modern aviation. However, it also emphasizes the pressing need for improved understanding, training and use of laser eye protection. As the skies become more challenging, ensuring the safety and security of our aircrews remains paramount. Proper LEP use is a significant step in that direction. ✈

Left: Laser pointers aimed at aircraft -- military, commercial or general aviation -- can be a major safety hazard. (Photo courtesy of Federal Aviation Administration)

Right: Dark clouds of Tropical Storm Debby, Tampa, Florida, Aug. 3, 2024. (U.S. Air Force photo by Senior Airman Sterling Sutton)

AVOID NIGHTTIME STORMS

TEAMWORK & AWARENESS SAVE THE DAY

By Lt. Adam Jones

PATROL SQUADRON (VP) 26
THE TRIDENTS

A successful mission hinges on individual skill and the coordinated efforts of the entire crew.

I was scheduled for an evening flight out of Naval Air Station (NAS) Jacksonville, Florida, to fly multiple practice approaches with two other pilots and one safety observer. We planned to conduct touch-and-go maneuvers with various approach profiles at Naval Air Station Joint Reserve Base Fort Worth, Texas.

During preflight checks, we noted the weather at both Jacksonville and Fort Worth looked great all afternoon and into the evening; but there was a line of storms building from Atlanta down to Tallahassee, Florida, during our return flight.

We took off on time and had an uneventful transit to Fort Worth with clear skies upon our arrival. We worked the pattern for about an hour before I used the satellite phone to call the weather briefer back at NAS Jacksonville for an update on the weather progression. Weather wasn't developing as predicted, with some unexpected gaps south of our position and could potentially cause problems on our return trip. However, NAS Jacksonville's weather remained on track. We completed a few additional holding patterns before receiving clearance for our homeward journey. During our transit home, the sun set and we could no longer rely on avoiding weather visually.

The P-8A has a weather radar that crews can use to increase their situational awareness of the environment around the aircraft. As we continued east we started to see bright flashes and the outline of thunderstorm cells. We queried air traffic control (ATC) about an apparent clear area we were detecting on weather radar and they immediately cleared us to the safe heading. We requested maneuvering south to avoid the weather, ATC advised that there was a gap opening on a more direct line back to Jacksonville. The crew checked the new heading and concluded we could not maintain the 25 nm standoff from all thunderstorms required by Naval Air Training and Operating Procedures Standardization and advised ATC we were deviating south around the storm. Once we were well clear of the storm to the south, we were given priority vectors direct to NAS Jacksonville and landed on time.

My main takeaway from this experience is that ATC will do everything within their power to provide safe vectors and altitudes, but they are not always aware of the rules we are required to comply with in this situation. Our crew remained vigilant and harnessed every element of information available to arrive at a safe and logical solution to the threats we were exposed to on this flight. By thorough preflight planning, maintaining a flexible attitude and utilizing all of our onboard tools, we achieved a favorable outcome and landed safely back at home base. ✈

COGNITIVE BIASES & CONVECTIVE DANGERS

By Lt. Cmdr. Kevin Riley, USCG, Dr. Benjamin Barton, University of Idaho and Dr. Brian Pugliese, Virginia Tech University

I had never shut a helicopter down in a lightning storm before and I was feeling low looking at our flight mechanic standing in pouring rain and illuminated by flashes of lightning. He seemed unbothered by our close call while shining his flashlight up at our droop stops and looked more like he was sitting on the beach in Hawaii. Many things led to this moment, but the bottom line was that I had let my crew down. Debriefing in soaked flight gear, I was thankful our crew of four were safe on deck, but realized my overconfidence in correctly anticipating convective weather was a key part of the danger in which I had put us. As a newly signed off instructor teaching nuggets to fly the MH-60T on the Gulf Coast, I had just gotten a serious wakeup call about how experienced pilots make decisions that can cost their crew dearly.

Our flight that night was part of a two-ship training mission to conduct night water introductions for two new pilots. Unknown to us, the terminal aerodrome forecast (TAF) was revised just minutes after we departed calling for powerful thunderstorms to impact the area later that evening. On receiving this news, our sister ship scrubbed the event before walking to the aircraft, while we continued for the next hour in clear weather 20 minutes away. Shortly after dark we received a relay from the operations duty officer (ODO) asking if we were going to return to base for weather. The weather was fine where we were but looking at the electronic flight bag (EFB) iPad we saw a large wall of convective activity moving fast toward our local flying area. Our tail had been pointed in that direction for much of our training and we had not seen any weather approaching visually or via our PRIMUS 700 radar which had been in standby mode for swimmer deployments.

We decided to cease training and pointed our nose toward home to make it back in before the storm hit. I could see on radar that our home plate was still just east of the band of storms that were approaching the field and made the decision to continue. I had just made two decisions unwittingly. The first was to pass up the opportunity to fly east and find a place to wait out the storm. The second was to not land at the nearby Mobile Downtown airport. This would have bought us a few extra minutes to shut down and get inside before the storm arrived.

Rather than taking the most conservative approach, I chose to continue toward our home field, which was shining brightly just a few miles away. Tower reported a strong cell that had been parked just north of the field for the last few minutes but otherwise the field was still visual flight rules (VFR) and the air station was still in a thunderstorm condition that allowed arrivals. As we approached the last half mile, my copilot said our hangar lights were disappearing under the night vision goggles (NVGs). Our intended point of landing was now rapidly disappearing in the goo as I looked across the cockpit at where the hangar should have been. We had a runway directly underneath us and I quickly

Lightning flashes across the sky above Little Rock Air Force Base, Arkansas, March 14, 2024. (U.S. Air Force photo by Airman 1st Class Julian Atkins)

THUNDERSTRUCK

asked the tower to amend our landing clearance for 1/19 and took the controls to stick a landing that would have been better suited for the back of a ship equipped with a flight deck. The second our wheels touched down we were engulfed in the hardest rain I had experienced in over 3,500 hours of flying. The squall line hit so hard that all I could see was turbulent water in the searchlight. The edge of our rotor disk and even the runway underneath us were washed away by the amount of water being dumped on us. Had we flown into that wall of water, I am not sure we would have had the power to remain in flight or to make a climbing turn out of instrument meteorological conditions (IMC).

Hindsight allows us to clearly see how the holes in the Swiss cheese lined up. First, the non-aviation watch stander did not alert us to the major change to the TAF. The second hole was our failure to attach the proper significance to our sister ship not coming out to train. The final element was my failure to maintain situational awareness on the approaching weather hidden behind our tail once darkness fell. The clues were all there, but I did not complete the puzzle in time to prevent a close encounter with convective activity. After a few months of flying in the area, I had easily navigated passing storms that had behaved predictably. Tonight, however, was an encounter with how unpredictable convective activity can be when thunderstorm cells unexpectedly appear in addition to what is being currently displayed on a radar or iPad screen.

I could have stopped these events at any time by simply landing at a safe place. Instead, I had felt the rush of the strong current of "we can make it" that I allowed to commit me, an experienced aviator, to recovering at our home plate airfield. The words of the Ops boss should have been ringing loudly in my ears that it was OK to not push weather to accomplish training. I should have decided before the flight that it was also OK to land at another airfield if the unexpected happens and you need shelter until the storm passes. Our command would have fully supported the most conservative approach to stop a bad chain of events from continuing.

Decision-making in rapidly changing conditions can make crews feel like they are making choices in an accelerating riptide. Decision traps are real and are often called cognitive biases. These cognitive biases are strong and hazardous decision-making currents that can put aircrews through "one way decision gates" and into unrecoverable situations if they are not recognized and exited quickly enough. These decision-making traps are what allow even experienced aviators to make choices in the moment that seem like surprisingly poor decisions in hindsight. Although more cognitive biases are present in the literature, the four introduced here are normalcy bias, group-think, confirmation bias and plan continuation bias.

Normalcy bias refers to the expectation that situations will continue as they have in the past. "We've always made it back in before" or the expectation that previous practices or "course rules" will still make it happen. Normalcy bias must be defeated by the timely recognition that things are not unfolding as they have before and that the script needs to change to meet a new and unexpected reality.

Group-think is the ignoring or suppression of better alternatives due to previous crew agreement. As we barreled toward our meeting with the squall line that night, the crew was on my iPad to see what the pilots were roughly seeing on our radar. Their agreement that it was safe to continue reinforced my decision to press when I should have been looking for the pressure relief valve to make things safer for everyone. We had plenty of gas and clear weather to turn to, but the reinforcement of our discussion had allowed us to continue too far without reassessing a developing situation. Risk assessment is an ongoing process and well-reasoned previous decisions should always be reexamined as the risk changes.

Confirmation bias refers to viewing information through the frame of a previous decision to which we've previously committed. New information is accepted or projected to further reinforce the previous decision and contrary information is ignored or rejected. The bias is not a willfully deceptive decision-making process, but rather reaffirmation of a decision that needs to be changed considering a new environmental reality. In this case, the field was still VFR and we were in a legal thunderstorm condition for arrivals. In a matter of moments, the field would change to low instrument flight rules and lightning within 1 nautical mile (1.5 miles). A cooler evaluation of the actual situation should have warned us things were rapidly changing and would deteriorate rather than improve or remain the same.

Plan continuation bias occurs when decisions are made to continue a course of action, despite mounting evidence the plan should be changed and has been overrepresented in aviation mishap reports for years. In this cognitive trap, crews may recognize the risks or the need to change the plan but fail to do so because the misperceived gain is considered worth the risk. This bias is referred to as "summit fever" or "get-home-itis." When aircrews begin to feel the rush of the riptide of events, it is time to start verbally announcing and reevaluating risk versus gain for the situation. Know when it is time to say "no."

Becoming as familiar with cognitive biases as we are of hazardous attitudes can make us better and safer aircrews. In the tides of aeronautical decision making, realizing the perception we are beginning to be swept in a riptide of unexpected and unfolding conditions is the first step of recovery. The best time to choose your exit in a riptide is as you feel the water rushing past your ankles. Remaining in the deepening and accelerating currents of cognitive biases or a bad convective situation can rapidly remove options for exit. Quickly recognizing the need to look for suitable alternatives and choose the most conservative way out will stop the error chain from continuing and stem the feeling of a dangerously accelerating tide. Re-energizing crew resource management and risk management processes is key to making continual and appropriate risk-informed decisions all the way to a safe landing. Hopefully without all the lightning nearby. ✈

NEARING THE EDGE

By
Anonymous

Marine Medium Tiltrotor Squadron (VMM) 265
THE DRAGONS

Risks of Pushing Aircraft Limits

Pushing an aircraft to its limits requires a delicate balance.

Military aviation demands skillful use of aircraft in constantly changing environments. This change could be a new co-pilot performing their first takeoff clearance or a seasoned crew tackling a dangerous mission. When pushing an aircraft to its limits, numerous factors come into play and can determine success or failure. A pilot's ability to recognize the aircraft's limitations is essential for a safe and effective flight.

A recent mishap during a training mission highlights the importance of this fact. Our crew's unfamiliarity with a critical aircraft limitation led to an operational error. We were unaware of a recently updated Naval Air Training and Operating Procedures (NATOPS) manual that now mandates planning for missions assuming less than 100% engine availability. This lack of knowledge prevented us from effectively responding to a loss of engine power during a mountain landing. Consequently, we were unable to control the descent rate and the aircraft sustained damage upon impact with the terrain.

Every flight has risk, managed with risk management (RM) and crew resource management (CRM) skills. Aviators are familiar with seven critical behavioral skills and employ them on every flight. In time-critical situations, we still use the four RM principles (accept no unnecessary risk, accept risk when benefits outweigh cost, make risk decisions at the right level, anticipate and manage risk by planning) and five-step process (identify the hazards, assess the hazards, develop controls and make risk decisions, implement controls, and supervise and evaluate). When operating near the edge of capabilities, we might accept some risk by not focusing on all flight profile elements. The goal is to use RM and CRM to optimize risk management and minimize error.

During the training mission simulating a tactical air fight with pilot recovery, we acted as the rescue team for a pilot downed behind enemy lines. The pilot scenario was pre-determined, but the exact location and timing depended on the student's performance in the dogfight.

The white cell managing the training didn't preplan the isolated person's location. Once they simulated a student being shot down, they provided us with a location. There was no rescue mission commander available and communication wasn't able to collect all mission details. This location was passed to us and we confirmed the grid and elevation.

Our mission planning load computation detailed the aircraft's hover-out-of-ground effect power required at the isolated personnel's location altitude. We knew our max hover gross weight at that altitude and were lighter than planned. However, those calculations assumed 100% power available, while a NATOPS change required planning to 95% power when operating above 1,000 feet and below 25 degrees Celsius. Because we weren't familiar with this recent limitation, we flew the aircraft as if we had more power than we did.

Approaching the isolated personnel, we climbed over a ridge line before visually identifying the location. Clearing the ridge, we saw that the grid location was in a narrow valley. We flew over the location and checked winds while searching for the survivor. The lack of a survivor to answer radio calls and authenticate contributed to CRM shortfalls between the instructor and student.

A workload surge in the objective area fractured CRM and situational awareness. We focused on separate tasks (flying vs. mission) instead of prioritizing as planned. Earlier intervention during the threat and error management (TEM) model's prepare phase in the holding area could have lessened the intensity of this CRM breakdown. A thorough review of the plan would have realigned our priorities with NATOPS – aviate, navigate, communicate, coordinate (in that order) and could have prevented miscommunication through improved information sharing.

During the hoist insertion after the flyover, we descended into the valley on the backside of the ridge. Due to insufficient power (95% instead of planned 100%), we couldn't arrest our descent and level off at the target altitude. It resulted in a controlled landing past the intended hover point, reaching the recover phase of the emergency procedures (TEM) directly. Ground effect allowed us to maneuver within the valley and land safely at the bottom.

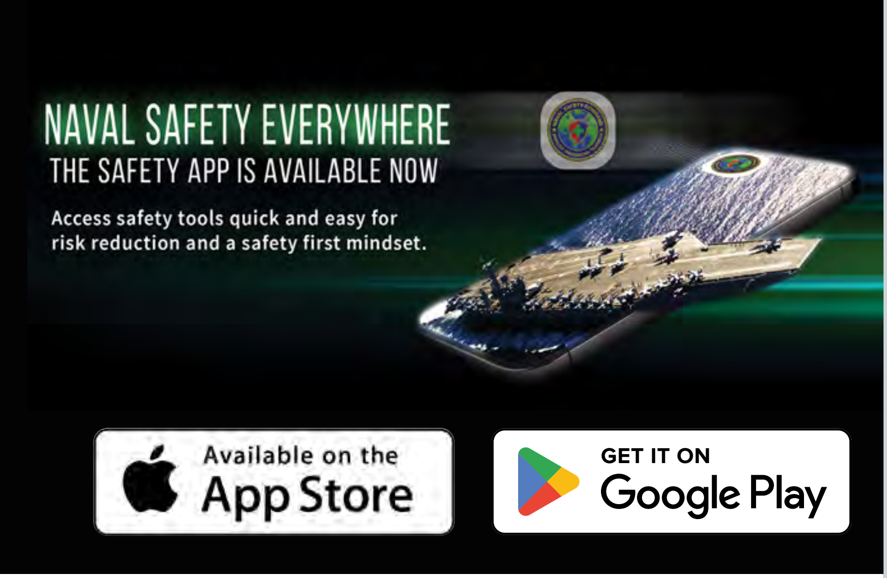
We have RM and CRM to help crews fly safely in tactical and non-tactical environments. We use TEM to "assist with the relationship between safety and human performance in dynamic and challenging environments." *On this flight, we missed a key threat with the NATOPS change. This led us to fly the aircraft closer to the limits than expected and prevented us from catching the error.*

What did we learn from this mishap? A thorough understanding of the recently implemented NATOPS limitation change regarding reduced power availability in mountainous environments could have prevented this incident. Crews must stay informed by continually checking for recently published NATOPS updates that affect flight operations. It's equally important to disseminate this information effectively within ready rooms.

Furthermore, when operating in mountainous terrain, prioritizing ingress course considerations over wind direction should be a key factor. Choosing an ingress path that minimizes descent rate over the terrain to reach hoist altitude could have significantly reduced the power demands placed on the aircraft.

CRM and RM should be ingrained in every flight and mission plan. By applying these principles with unwavering focus on high-risk elements, we can significantly enhance our safety margins. ✈

MV-22B Osprey tiltrotor aircraft with Marine Medium Tiltrotor Squadron (VMM) 262, Marine Aircraft Group 36, 1st Marine Aircraft Wing, conduct flight operations over Kumamoto, Kyushu, Japan, Oct. 25, 2023. (U.S. Marine Corps photo by Cpl. Kyle Chan)



Safety in Your Pocket

By Leslie Tomaino

Naval Safety Command (NAVSAFECOM) app is a mobile-friendly way to keep up to date on all things Navy and Marine Corps safety and risk management. The app allows Sailors and Marines on-the-go access to safety-focused learning and improved communication.

The mobile app is a robust toolkit containing NAVSAFECOM products, such as checklists, forms, news, videos, instructions and directives, as well as warfare community-specific products and information. It reinforces important safety and risk management information that can be universally useful throughout the naval enterprise, from safety representatives to service members daily.

"This mobile application allows our Sailors and Marines to access and download information in advance for use remotely," said CMDCM (AW/SW) Dean Sonnenberg, NAVSAFECOM command master chief. "This app is an additional tool for the warfighter and safety professional to help advance our mishap-focused, reference and standards-driven lens."

Users have the option to personalize their preferences and select content specifically relevant to warfighting communities and categories. These communities include aviation, shore, afloat and expeditionary.

Users can download the free app from the App Store (Apple) or Google Play by searching "Naval Safety Command" or "NAVSAFECOM" in the app stores or your web browser. Sailors and Marines can also find this app and many others in the Navy App Locker: https://www.applocker.navy.mil

Safety tools in your pocket. Download the Naval Safety Command App in the Navy App locker. (U.S. Navy Photo courtesy of Naval Safety Command)

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When submitting articles and photos, please include:

Title: Proposed headline, though it is subject to change

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Article: Authors should fact check and ensure statements are backed by references or sourced data. Spell out acronyms on first reference. Spell out all organizations and units, as well as city, state or country. Authors need to ask a team member and/or subject matter expert to review article before submitting. NAVSAFECOM and/or CMC SD may make additional changes for clarity and style during the review process.

Article length should be 450-1600 words. Bravo Zulu inputs should be 90-150 words and include a photo.

Photos: All submissions must be sent as separate files and approved for public release. Images should adhere to established safety and security policies. Images should be the original with minimum 1 MB file size. Include the photographer's full name, rank, unit and full description of the image and date taken.

Send to: navsafecom_approach@us.navy.mil

We look forward to including your submissions!

Stay Connected

Front: Naval Aircrewman (Helicopter) 1st Class Miguel Velez, assigned to the "Pioneers" of Squadron (VX) One over Alpena, Michigan on Aug. 13, 2024. (U.S. Navy photo by Mass Communication Specialist 1st Class Juel Foster)
Back: Aerial view of Nimitz-class aircraft carrier USS Carl Vinson (CVN 70) moored on Joint Base Pearl Harbor-Hickam, Hawaii, during Rim of the Pacific (RIMPAC) 2024, July 5, 2024. (U.S. Air Force photo by Master Sgt. Corban Lundborg)

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