Flightfax
Number 100 April 2021 Online Newsletter of Army Aircraft Accident Prevention

100th Issue of Flightfax Restart!

Ladies and Gentlemen, this month marks an outstanding achievement here at the Combat Readiness Center (CRC), our 100th Edition of Flightfax since restarting the program after a four-year hiatus. After high demand from the field, we reignited this initiative in 2013 to meet the needs of our Army by sharing professional articles and safety trends important to our aviators. As professional aviators, it is essential to learn the most we can about our given profession; Flightfax has been here as a tailored magazine specific to Army Aviation and our unique challenges. However, Flightfax could not have achieved this without your support.

Remember, Flightfax is our magazine here to support us as Army Aviators. As some of the old-timers may remember, Flightfax began its first edition in 1976 and continued as a useful tool to Army Aviation for sharing knowledge of mishaps, trends, and the current environment with lessons learned. It was a magazine designed just for us. Units had hard copies posted to reading files and articles distributed all over the organization to ensure the widest dissemination. This was our way of ensuring everyone could gain a shared understanding of the current challenges facing our operations and have the best chance of success at being tactical and incidental risk. This still remains true today.

While there was a brief lull from 2007 to 2010, Flightfax is here to stay and endeavors to remain responsive to the needs of commanders and Army aviators. This is our chance to share our lessons learned and our stories to the field. You can help support this initiative by continuing to send your articles to Flightfax and be a part of history helping your fellow aviators. While Flightfax is produced at the CRC, we need your articles, ideas, and concerns to share with the field and have the most impact. Additionally, if you know any aviators not subscribed to Flightfax have them subscribe at the link below. With your continued support, we look forward to another 100 issues that support our overall Army Aviation efforts across the Army. You can subscribe to Flightfax via email at FLIGHTFAX-request@LIST.CRC.ARMY.MIL ■

4th Quarter Spike Engagement

This issue of Flightfax continues our engagement on reducing the 4th Quarter Spike which Army aviation exhibited prior to FY20. The Combat Readiness Center Aviation Division planned and executed a campaign in FY20 to hit high payoff targets in reducing mishaps during the 4th quarter of the fiscal year. The efforts were part of the success in reducing the spike, along with Army aviation leaders and Soldiers doing their part at the tip of the spear.

During FY21, the Aviation Division continues the effort, with Flightfax articles being a part of the campaign, to get at the targets that play a role in producing mishaps. In issue 100, we targeted Army aviation operations at terrain flight altitudes while addressing performance planning and power management, in particular for high, hot and heavy environments. Terrain flight, performance planning, and power management go hand-in-hand when units are operating in demanding environmental conditions which place the aircraft and crews at their operating limits. We didn't forget about our unmanned aircraft systems and crews. They also are at risk during the 4th quarter and require the same rigor in leadership as manned units to ensure the aircraft and crews are reducing their risk and remaining in the fight.

Additionally, the 4th quarter puts additional pressure on crews with operations at the hottest time of the year and the turbulent weather conditions associated with summer weather, thunderstorms. Our weather article will give you a quick primer on thunderstorms and their hazards.

Let's continue to stay in the green in our operations during the 4th quarter and prevent mishaps and spikes from occurring. Remember, you are the reason that Army aviation succeeds in executing combat missions in the most demanding environments across the globe. Every single Soldier is important in being able to continue the mission. So make sure you do your part in staying on target and driving your risk to the minimum. ■

The Terrain is Your Friend and Your Enemy

Many aviators in service today were brought up in the counter-insurgency (COIN) fight and have operated in operational environments (OEs), such as those in Iraq and Afghanistan, against an unconventional and ill-equipped force. Aviators operating in these environments quickly learned that altitude coupled with advancements in aircraft survivability equipment (ASE) enabling defeat of infrared (IR) guided munitions maximized crew survivability during enemy engagements. The remaining challenges to overcome were environmental, such as a degraded visual environment (DVE), power limiting conditions, or a combination thereof.

As Army aviation shifts its focus to large-scale combat operations (LSCO) against a peer/near-peer threat, the current Army aviator must learn old tactical proficiencies while integrating new aircraft technologies. To combat an integrated air defense system (IADS) with advanced early warning radar, aviators will rely not only on survivability equipment but proper terrain masking techniques to avoid detection by the enemy. Unfortunately, the persistent focus on high altitude flight profile tactics against COIN degraded Army aviators' skills at terrain flight altitudes. Army aviation must be able to operate at terrain flight profiles and maintain aircraft maneuverability; all while managing survivability against a radar threat environment. To counter the expected increase in aviation accidents related to terrain flight training, a training support package (TSP) was released to assist commanders in planning and executing a focused terrain flight training program.

Aircrew Training Manual

A military should conduct training to proficiency for the most adverse conflict expected. If the next conflict involves a peer/near-peer adversary, Army aviation must be prepared to fight and win in any flight profile necessary. The primary flight profile will require terrain flight proficiency to maximize aircraft survivability and mission success. Currently, terrain flight is not a mandatory task on the rotary-wing master task list (MTL) for aviators except the AH-64D/E. Commanders are strongly recommended to add the tactical terrain flight task to the aircrew member's (ACM) critical task list (CTL) and annotate correct iterations requirements to maintain terrain flight proficiency within their aircrew training program (ATP). Without the commander's authorization to add these optional tasks, the ACM cannot train the skills necessary to survive in LSCO.

The Dangers of Pilot Tiering

Some units have adopted the pilot tiering model, which is intended to mitigate mission risk by restricting various flight modes, profiles or mission sets that a pilot in command (PC) may conduct based on their flight experience. Pilot tiering is in direct violation of Training Circular (TC) 3-04.11, Commander's Aviation Training and Standardization Program, and, by its authority, Army Regulation (AR) 95-1, Flight Regulations. The PC must be proficient in the aircraft and all aspects of the unit's mission essential task list (METL).

There tends to be a detriment of pilot proficiency resulting in accidents where units have adopted a tiering program. Tiering removes the commander's ability to enhance combat readiness and performance through proper battle-rostering of crews. More demanding modes or missions deemed higher risk are entrusted to ACMs with more flight experience. Exacerbated by manning constraints, and depending on the flight experience of a lower-tiered crew, that crew may not maintain proficiency in the unit's mission sets under more demanding modes. However, the crew is expected to conduct the next tier missions once the minimum flight hour level is attained.

Accidents occur on both spectrums. One accident

involved experienced aviators, tired and complacent from poor fighter management, resulting in foreign object damage (FOD) to an engine when failing to remove fly-away gear. On the other side of the spectrum, an accident involving a less experienced crew, upon reaching the next tier, was assigned to conduct a 2nd tier air assault at night. The PC had not conducted a night assault in over 6 months before his PC designation. The lack of proficiency resulted in a hard landing causing significant damage to the aircraft during an infiltration.

The following incident describes how the attached unit, regulated to follow the tiering model, was able to build readiness in one of its junior PCs. Reluctantly the ATP commander permitted the PC training program to include robust emergency and contingency training under all modes. Two pilots were concurrently trained to PC and were, battle-rostered together ensuring proficiency and currency in all modes and missions until they gained enough time to operate at the next tier based on individual experience level. This strained the unit's fighter management but was worth the effort when one of the newly 2nd tiered PCs safely executed a power limited dust landing at night after losing an engine.

Empowering and Entrusting Your Crewmembers

Tiering will stunt the proficiency of the PC, and also negatively affect progression. Pilots in command, and air mission commanders (AMC), must be multifaceted aviators; able to operate from either crew station under every mode. This will permit proper crew mixes based on the mission and responsibilities. Air mission commanders must have the latitude to move experience levels in the flight where it is needed. For example, an attack weapons team (AWT) AMC may need to battle track multiple aspects of an operation from either crew station. The AMC should place a competent aviator in the pilot station who can effectively communicate with the other aircraft, as well as maintain effective situational awareness and obstacle avoidance as the AMC is focused on battle management. **Empowering the pilot to take on more responsibility and learning to delegate authority as a PC should be a byproduct of every flight. Mentoring pilots to become PCs and not just pilots (PI) is essential to building positive crew coordination and proficiency.**

Afghanistan poses some additional challenges that are not necessarily a common factor in other OEs. Many of the mountains in Afghanistan, due to power limitations, are not crossable. If not paying close enough attention, one could easily fly into one of these mountains which is a "controlled flight into terrain" or CFIT event. A significant CFIT event "didn't" happen south of Shindand Air Base in Afghanistan in the summer of 2014, the event is as follows: While in a mountain draw, at night, the standardization pilot (SP) was tracking a target through the sensor in the forward crew station. The PI in the rear crew station on the flight controls was in PC progression training. Although the SP was the PC of the aircraft and the AMC of the flight, the SP briefed the pilot to act as if he was the PC so that the SP may conduct role-reversal training throughout the flight. Tracking the target was difficult in the confined space and the sensor was at its limits. In a left orbit, the SP directed the PI to come right, which he did. When the sensor reached another limit the SP directed him to come right again. The PI told the SP "no, we can't do that." A bit frustrated while tracking the target the SP asked, "Why?" The PI told the SP to look out the right door and the SP saw the aircraft was flying parallel to a steep rock face at approximately 1-2 rotor discs separation. "Okay, you're doing fine just keep us away from that mountain!" Senior pilots are not infallible. If the AMC had selected the junior PI from the opposite aircraft to be the pilot on the controls, he would have done exactly what the SP told him and flown right into the mountain. The PI did not split his focus between the targeting feed and maintaining his situational awareness outside the aircraft. He trusted the SP to give him direction and target updates and in turn the SP trusted the PI to safely and effectively maneuver the aircraft. Empowering PI to take command, establishing trust in the delineation of duties, and developing effective crew coordination is essential for PC development.

Evasive flight maneuvers

Through the development, testing, and implementation of the 2900 series evasive flight maneuver tasks, crew coordination is critical to the survivability of the crew.

The tasks and training procedures were adjusted to direct more responsibility to the pilot not on the controls. Depending on the threat, the crew

has limited time to react effectively. The pilot on the controls must trust and take direction from the pilot, not on the controls. At the onset of a threat engagement, the pilot not on the controls is focused on the threat indications while directing the pilot on the controls to turn and stop turn. The pilot on the controls is completely focused outside maintaining situational awareness and obstacle avoidance while maneuvering to take advantage of the terrain and terrain masking.

Timing, heading changes, and bank angle are critical to successfully defeat the threat. Initially, the task reflected the pilot on the flight controls identify the threat indications, make the maneuver decision, and execute the hands-on performance task to defeat a threat engagement. The pilot on the controls was focused inside the crew station for an unacceptable duration of time to monitor the threat indications and conduct the appropriate maneuver. With the expectation the maneuver is conducted in a radar threat environment, the aircrew should eventually train at terrain flight altitudes as prescribed in TC 3-04.4, Fundamentals of Flight, and classified tactics, techniques, and procedures (TTP) reference. The maneuvers are not an aggressive change in-flight profile yet the pilot on the controls would occasionally remain focused too long on the threat resulting in an unusual attitude and impending CFIT event.

Summary

Effective mission planning is still the primary means of threat defeat. The Strategy Tactics and Analysis Team (STAT) (consisting of the master gunner, S-2, electronic warfare officer, and the aviation mission survivability officer) working within the staff provide the continuity of threat tracking and mission planning. The STAT is responsible for evaluating enemy TTPs and developing tactics and mission products for the aircrews. These mission products will include recommended terrain flight altitudes, template enemy locations, and recommended TTPs for survivability and mission success. The mission planning process uses the terrain to maneuver through and exploit the enemy's defenses in an IADS and LSCO environment. The Army cannot afford for aviators to do the enemy's job; by self-attrition due to a lack of aircrew proficiency while operating and maneuvering at terrain flight profiles. ■

Note: *The Survivability Branch is always searching for interested and qualified personnel. If you feel you have the experience and the ability to contribute to the Aviation Branch's survivability areas of concentration, contact the DOTD Survivability Office for a consideration packet.*

Above the best!

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Unmanned Aircraft System Leaders, the "Break in the Chain"

In aviation and specifically unmanned aircraft systems (UAS), we never plan to have an accident. However, as UAS leaders, we often fail to plan leading to a "break in the chain" and ultimately a human error – facilitated by leader failure. In over three years as the senior UAS observer, coach, and trainer (OCT) within the Aviation Division at the Joint Readiness Training Center (JRTC), most of the incidents I observed occurred were at some level, a failure of UAS leadership failing to plan appropriately or to position themselves and their junior leaders in the correct place at the correct time. The number one "improve" trend for UAS revolved around the command and control (C2) War Fighting Function (WFF), specifically during tactical unmanned aircraft system (TUAS) site-selection survey.

Opinions Count

After discussion during after-action reviews (AARs), it is almost always discovered that leaders had a break-down in troop leading procedures (TLPs) or the operations process, specifically during the planning and preparation phases. After action reviews of UAS at JRTC indicate that the most important steps that lead to the successful execution of flight operations in UAS are the site survey and setup of the launch recovery site (LRS). Understanding this, why is the C2 of the LRS set up one of the things we observe the least at JRTC? During this phase, the leader's focus is myopic on flight and mission planning, leaving LRS planning and operations to others. This coincides directly with leaders failing to be in the critical "right" place at the right time. Those others, operators and maintainers, are left to establish the LRS unsupervised with little proficiency in the actual execution of that operation. Leaders are responsible for the training of Soldiers. How are we training them to be proficient at these tasks? Are we conducting risk management beyond our risk-common operational picture (RCOP) for flight?

Known Deficiencies

One of the known training deficiencies within UAS is the LRS setup. In garrison, TUAS platoons are rarely ever forced to conduct a site selection analysis due to the limited amount of landing strips available (training constraint.) Planning for site setup drills prior to field/training center events is imperative for UAS Soldiers to understand the process and know their individual roles in the process. Along with this, it is just as important for our UAS leaders to conduct rehearsals and risk management of this critical task. Applying risk management of this task will help UAS leaders visualize their organization and their abilities to conduct this task safely and appropriately to avoid accidental loss of aircraft or ground support equipment (GSE) and its components. "Risk management provides consistent and systematic identification and communication of risks, consequences, and potential actions to mitigate those risks…" – Department of the Army (DA) Pamphlet (PAM) 385-30, Risk Management.

Summary

As UAS leaders, identifying the hazards and risks associated with the tasks the unit performs and implementing controls to mitigate those risks will ensure proper site emplacement. Leaders should implement training programs to bring their Soldiers and junior leaders to standard on the analysis and further setup of LRS. Implementing the five-step risk management process into TLPs and the operations process during UAS operations will also ensure that we are putting leaders in the right spots at the right times. That five-step sequence requires leader involvement in each step. As UAS leaders and professionals, it is our responsibility to make sure we are involved in those steps and have trained our Soldiers to standard.

The uniqueness of UAS and the robust support it takes to execute UAS flight operations inherently makes being a UAS leader difficult. Planning and applying risk management, training to standard, rehearsals and implementing controls based on the R-COP ensures as leaders we are not the human error… the leader "break in the chain." ■

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Know Your Numbers, Power Management and Performance Planning

In September of 1999, almost an entire issue of Flightfax was dedicated to power management and performance planning. The issue preceded a series of Class A accidents with power management and performance planning findings. The issue highlighted several aviation accidents with power management and performance planning deficiencies and provided lessons learned that are applicable today. You can read the entire issue at https://safety.army.mil/Portals/0/Documents/ON-DUTY/AVIATION/FLIGHTFAX/Standard/Combined_Year/ 1999_Flightfax_Combined.pdf

The More Things Change, the More They Remain the Same

A lot has changed since 1999. Aircraft, CH-47F, UH-60M and AH-64E, have increased power margins over their predecessors, however, mission weights of most modern airframes have also increased. Performance planning is still a requirement for each flight in accordance with Army Regulation 95-1, Flight Regulations. Performance data can be derived from several sources to include the performance charts out of the applicable aircraft operator's manuals (-10s), approved digital performance planning programs, as well as aircraft performance (PERF) pages found on the UH-60M, CH-47F and AH-64D/E model aircraft.

Aviators understand the things that have changed since operating 1999 airframes, but they also understand what has remained the same, aircraft can still hit their power margins. With increased mission weights, temperatures and density altitudes come reduced power margins. Thorough performance planning and shared understanding of the performance data among the crew is critical for mission success and operational safety of the crew and aircraft. Simple information such as awareness of wind direction and speed plays an important part in staying within the margins.

Training Overcomes the Margin Delta

Aviation personnel should use simulators to fly in conditions you may not be able to replicate at home station (e.g. flight at the power margins: high-density altitude, high altitude, and high gross weight). Do things in the simulator that you can't normally do in the aircraft to build muscle memory. Jettison those external stores and external auxiliary fuel tanks so that you can see how much power margin is reclaimed with that weight reduction. This also provides aviators with repetitive training on a task which most aviators have never had to conduct, jettison external stores or fuel tanks. Practice in the simulator makes perfect, so if a crew is faced with the need to jettison stores or tanks, it isn't a "first time" event in the aircraft while in mission profile and they won't hesitate as they will understand the reclamation of power.

Train and Apply Techniques of Power Management and Performance Planning

A note from the Director of Army Safety (DASAF) in that September 1999 issue of Flightfax indicated that he was concerned that Army aviators of that time, perceived they had unlimited power margin available in the dual-engine helicopter models they operated. Most pilots of that era had operated a legacy single-engine helicopter with a much slimmer power margin before transitioning to a dual engine aircraft. The DASAF basically told them they had forgotten where they came from. If you flew: A model Black Hawks, D model Chinooks, D model Apaches, or either of the training helicopters at flight school you have flown something with a more reduced power margin than what you are currently flying in your field unit. All aviators should apply the techniques of power management and performance planning to understand their power margins before they pull the start trigger or advance a power control lever. This will ensure they can operate safely even when in a high, hot and heavy combat environment.

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Summer Weather for Aviation

What do you think of when you hear "spring" or "summer"? Family vacations? Beach trips? BBQs? Swimming? Picnics at the lake? Berry picking? Mowing the lawn?

Sounds like fun---except for the part about mowing the lawn! To most meteorologists and aviators, "spring" and "summer" conjure up something very different. Air mass thunderstorms. Sea breezes. Outflow boundaries. Microbursts. Severe weather. Squall lines. Hurricane season.

Spring/summer is a time when many flight hazards exist for Army aviators. Understanding these hazards and preparing for them are the keys to staying safe while executing the Army aviation mission.

Let's start with thunderstorms. All thunderstorms imply severe icing, severe turbulence, lightning, heavy precipitation, hail, and low-level wind shear (LLWS). Says so right there in Block 22 of your DD 175-1 Flight Weather Briefing. I'll go a step further and add that all thunderstorms have the potential to produce a microburst.

Thunderstorms: To understand the basic dynamics of a thunderstorm, just remember M-I-L. Moisture. Instability. Lift. Start with some moisture. Add a pinch of instability. And a dash of lift. That's the basic recipe for a thunderstorm. Throw in a sea breeze, an outflow boundary, or other interaction, and an air mass thunderstorm can quickly ramp up in intensity and coverage.

Of all the tools at our disposal, radar is the single most important in monitoring the development and progression of thunderstorms. Using radar imagery, we can track the location and movement of precipitation; identify thunderstorms versus showers; pin-point any areas of hail or rotation; interpret whether the storms are building or weakening.

Radar imagery can be deceiving ... if you don't know what you're looking at. Seeing a red blob on radar imagery does not necessarily mean there's a thunderstorm present. The red could mean a thunderstorm, but it could also mean large raindrops or a large number of raindrops. The interpretation of red also depends on which product you are viewing (base reflectivity (BR) or composite reflectivity CR).

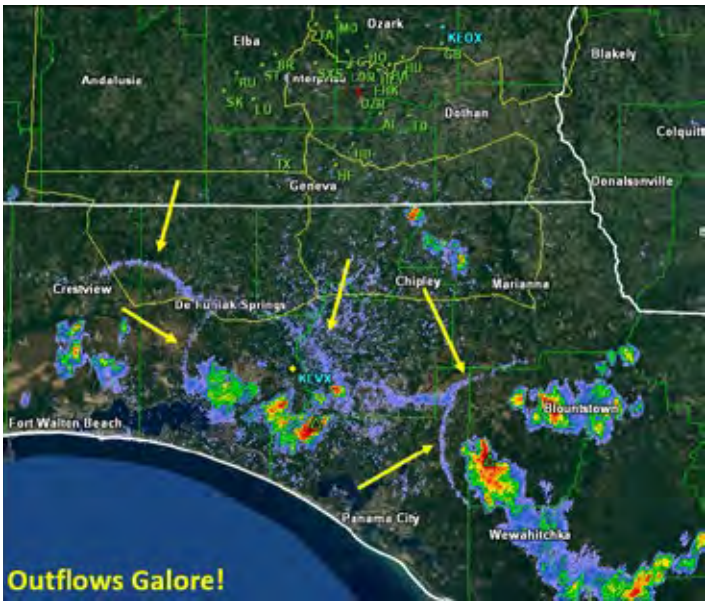

Figure 1, Source: Gibson Ridge 2

Sea Breeze: The sea breeze forms along coastlines due to the differential heating of land and water. By day, the land heats up more quickly than the water, which creates a pressure gradient and an on-shore flow. By night, the process reverses. This same effect can occur with any large body of water (lake, river, etc.). The sea breeze is evident in satellite and radar imagery.

Outflow Boundaries: An outflow boundary, or gust front, marks the dissipating stage of a thunderstorm. You'd think that's good news, but it's not! Across an outflow boundary, you'll notice a wind shift, gusty winds, LLWS, and turbulence. There's even a difference in the temperature and dew point. Sounds like a very small-scale cold front. It is along these boundaries, that new thunderstorms tend to form. When outflow boundaries converge with each other or with other storm cells, things can go downhill fast. Since most commercial websites and apps (including ForeFlight) filter the outflow boundaries and air traffic control (ATC) radar doesn't detect them, it's challenging to identify one unless you know what to look for.

So what are you looking for? First, use a data source that does not filter outflow boundaries. National Oceanic and Atmospheric Administration (NOAA)/ National Weather Service (NWS) and College of DuPage are excellent sources. Be sure you're looking at a BR product with, lowest elevation (typically 0.5 degrees). Finally, look for the classic arc-shaped return that is moving away from the parent storm. Check out the

radar images below of outflows near Cairns Army Airfield (AAF) captured a couple of summers ago.

Microbursts: As noted earlier, every thunderstorm has the potential to produce a microburst. A microburst is a sudden, violent downdraft of wind in a thunderstorm that is less than 2.5 miles in scale. The winds rush down and out, radially, in all directions. The damage from a microburst can be even worse than that of a tornado, and microbursts present a grave danger to aviation, particularly to rotary-wing pilots.

Air Mass Thunderstorms: These thunderstorms are prevalent during the summer months. In and of themselves, they are usually manageable and easy to pick around. However, certain interactions can quickly wreak havoc on aviation. We constantly monitor the radar for outflow boundaries, merging cells, sea breeze, and other interactions that tend to ramp up convective activity.

Thunderstorm hazards exist up to 20 miles outside of the core of a thunderstorm. The best way to avoid thunderstorm hazards is to steer clear of thunderstorms.

Squall Lines: Squall lines occur frequently during the springtime. A squall line looks nasty (Figure 2). That's because it IS nasty. Even nastier is the bow echo (Figure 3). When you see a line of thunderstorms begin to bow out, that's an area you want to avoid. A bow echo is usually indicative of damaging straight-line winds.

Hurricanes: Hurricane season runs from 01 June through 30 November. Hurricanes form over the warm ocean waters and can even impact areas well inland. Impacts vary by location. Coastal locations will see the strongest winds along with storm surge. Winds weaken as a tropical cyclone moves inland, but inland locations can still see hurricane-force winds, heavy rain, flooding, and tornadoes as the rain bands rotate around the center of circulation.

Hurricane Season 2020 was a record-breaking year! By mid-September, our alphabet was exhausted, and we got nine letters into the Greek alphabet by the end of the season. The 2020 season featured a record-breaking 30 named storms; 13 hurricanes (average is 6); and 6 major hurricanes (average is 3). Twelve storms hit the US coastline, smashing the previous record of nine in 1916. Five of these storms made landfall in LA.

What do the tropics have in store for 2021? Only time will tell, but the experts will weigh in soon. The

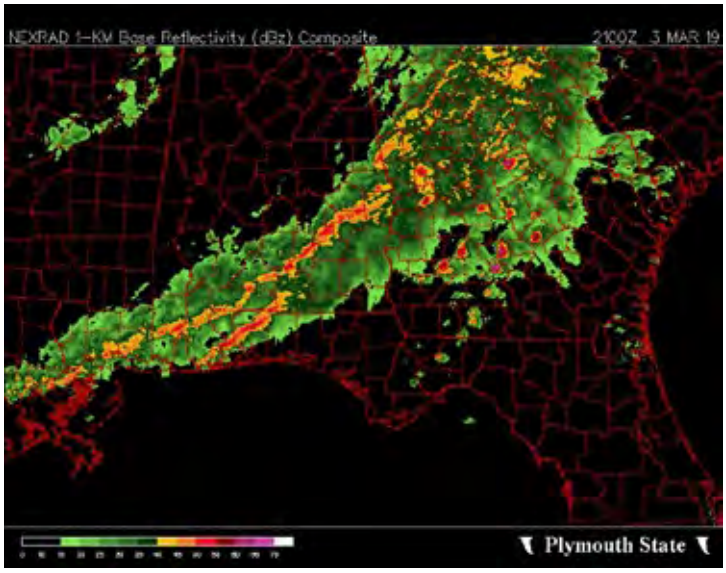

Figure 2, Source: Plymouth State

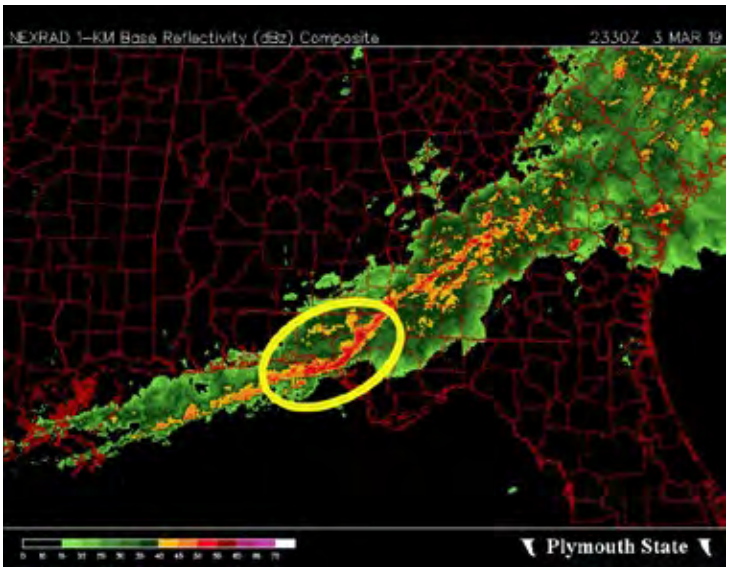

Figure 3, Source: Plymouth State

Colorado State University team will release their first stab on April 8, 2021, and NOAA usually issues their initial outlook in early May.

A Final Word

Many aviation hazards exist during the spring and summer months. The threats from severe weather and thunderstorms must not be underestimated during Army aviation operations during the summer months. Make sure you get a thorough weather brief for your mission time period and update periodically. Summer weather can change rapidly. Be informed. Ask questions. Fly safe! ■

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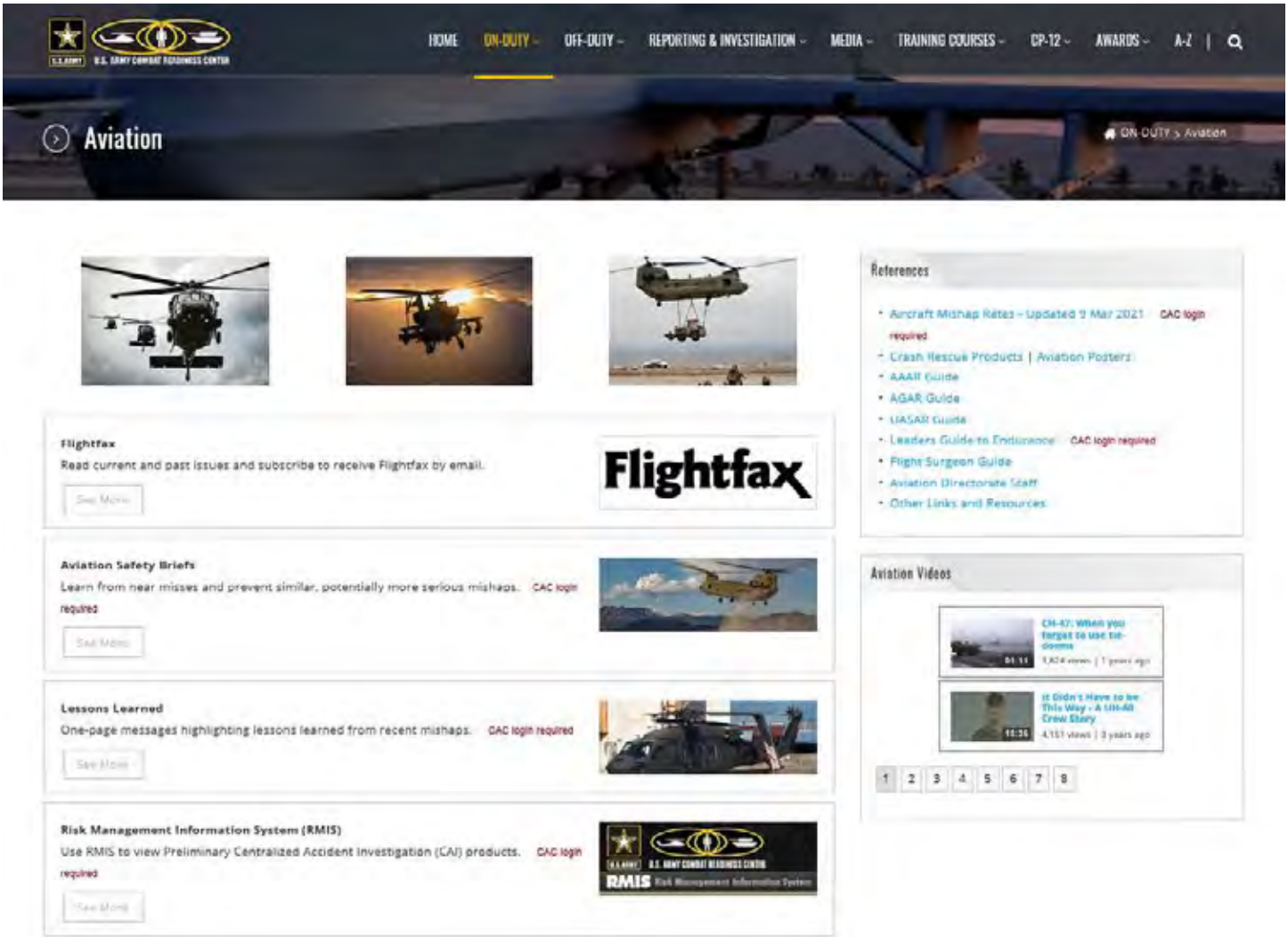
Directorate of Assessments and Prevention (DAP) Aviation Division

The United States Army Combat Readiness Center (USACRC) has an office that falls under the DAP whose sole focus is aviation. The Aviation Division fields numerous requests from all corners of the globe relating to Army aviation. A few of these responsibilities are in an advisory capacity for mishap reports and conducting mishap briefs Army-wide, ensuring lessons learned (L2) are shared across the Army aviation enterprise. Below we will discuss a few useful tools the aviation division provides to the field. You are able to access these tools without contacting the USACRC.



Aviation Safety Brief

The Aviation Safety Briefing has evolved from its former self, the "Near Miss Briefing." A few years back the USACRC deployed accident investigators to the field to provide aviation units, all components, with a relevant briefing of recent mishaps or near-misses. The intent was to assist units in changing negative thought processes and to mitigate the potential next mishap. **The Aviation Division has made this briefing modular so units may tailor it to their needs. The base slides as well as the individual vignettes are available for download. There are currently 15 individual vignettes for you to choose from and tailor to your audience.**

The Aviation Safety Briefing will address some

of the fatal accidents when briefed by the USACRC briefer. These vignettes are not found on the www.safety.army.mil website, only non-fatal mishaps. The Aviation Safety Briefing "traveling roadshow" is back by popular demand and can be requested and scheduled through the USACRC Operations Division and is funded by the USACRC. Please contact the G-3 Division at 334-255-9398 or send an e-mail to the usarmy.rucker.hqda-secarmy.mbx.safe-helpdesk@mail.mil

Flightfax

Flightfax has been a cornerstone of Army aviation for over 50 years. Past aviators will tell you that copies were in every office and flight planning room when they were distributed in print. The first thing anyone would do is to flip to the back page to see if they recognized any of the accidents. The Aviation Division provides access to the archives of past articles in addition to special editions. The special additions are for hot topics that need to get out to the field in a rapid manner. If you are not a member please visit our site and subscribe to stay informed.

Lessons Learned

The USACRC prides itself on accident prevention. Every tool, stat and product produced is developed for the Soldier to assist in the mitigation of the next accident. The summary of each mishap the USACRC investigates produces a mishap synopsis, summary of key facts, and prevention recommendations. This information is intended as a briefing tool at the unit level to educate personnel on mission hazards, associated risks, L2, and control measures to prevent a recurrence.

Army Safety Management Information System 2.0 (ASMIS 2.0)

Access to ASMIS 2.0 is behind common access card (CAC) protection and requires approval to access. The application provides individuals with a few valuable tools to share with unit personnel. In addition to the ability to search the database, one of these tools is the Centralized Accident Investigation (CAI) repository. Each mishap the USACRC investigates produces an executive summary, history, findings, and recommendations. It includes a single page vignette and safety sends message. These products are for accident prevention purposes only and provide an excellent tool for mishap prevention and L2 during aviator academic classes or in a small group setting to discuss aviation mishap prevention.

Summary

Whether you are looking for the latest aviation mishap statistics, waivers, or general aviation knowledge the Aviation Division is your one-stop shop. Please visit our site and check out all the tools we have available for you and your team. ■

References:

USACRC DAP AVN DIV Site https://safety.army.mil/ON-DUTY/Aviation

CW4 Robert Moran
Mishap Investigator
Aviation Division
Directorate of Assessments and Prevention
United States Army Combat Readiness Center

Visit the U.S. Army Combat Readiness poster library to download all of our Aviation posters at: https://safety.army.mil/MEDIA/Poster-Library/Posters

Mishap Review: *H-60 Failure to Plan for Environmental Conditions*

While performing combat maneuvering flight (CMF) training, the pilot in command (PC) improperly estimated the amount of control input that the aircraft performance and environmental conditions would allow. During the maneuver, the PC placed the aircraft in a 60-degree right bank, 24-degree nose-low attitude at an altitude of 400 feet above the highest obstacle (AHO). During the maneuver, the power required to maintain flight exceeded the power available causing the aircraft to descend into the trees. The PC and pilot (PI) failed to performance plan for the environmental conditions during the conduct of the mission. The crash destroyed the aircraft and four crew members sustained injuries.

History

The mishap crew's mission was to conduct four segments of continuation training with another aircraft including CMF, visual flight rules (VFR) cross country with refuel, and high altitude training in confined areas with CMF for crew chief (CE) readiness level (RL) progression. The mishap crew reported for the mission at 0900, where they conducted pre-flight, mission briefing, and run-up. The non-mishap crew had a maintenance problem and was delayed. Therefore, the mishap crew changed their flight plan and took off direct to the mountain training area (MTA) to conduct high altitude training while waiting for the second aircraft to join up once their aircraft was operational. The two aircraft linked up at 1226 where they began the second segment of training. The flight of two completed their VFR cross-country flight and stopped at a civilian airport to eat and refuel their aircraft. The flight of two departed the civilian airport and headed to the MTA for high altitude training in confined areas and CMF. Once the aircraft landed at the first landing zone (LZ), the flight broke up into single ship operations. The aircraft began conducting CE RL progression training for the CMF task of breaking contact. During the breaking contact CMF maneuver, the PC placed the aircraft into a position where it had insufficient power to recover prior to contact with the ground.

Crew

The PC had 1,207 hours in MTDS and 1,368 hours total time. The pilot (PI) had 135 hours in MTDS and 256 hours total time.

Commentary

The PC, on the controls, improperly estimated the amount of control input that the aircraft performance and environmental conditions would allow. The PC failed to determine the environmental effect that operating above 9,000 feet mean sea level (MSL) would have on aircraft performance. When the PC placed the aircraft in a 60-degree right bank, a 24-degree nose-low attitude at an altitude of 400 feet AHO, he exceeded the power available which prevented him from recovering from the maneuver and subsequently crashed into the trees. The PC's actions were a result of indiscipline and overconfidence.

Combat maneuvering flight operations require deliberate performance planning, just as every flight requires. Operating in demanding environments with limited power while not understanding what CMF task can be accomplished within the environmental constraints results in bad outcomes for the crew and aircraft. Pilots need to take the time to determine aircraft performance for every flight whether conducting CMF or not. Your crews depend on you to understand the implications of executing certain task which requires maximum performance of your helicopter.

Crews should take into account what missions they will be performing and what tasks will be needed. Units should ensure that during their environmental training instruction, they address aircraft operations at maximum limits, such as FADEC-F requirements and limitations for CMF. Had the PC in this mishap reviewed the specific tasks and performed some additional planning he may not have ended up in the trees. Additionally, conducting Army aviation flight operations is a team event. The entire crew must be involved in the planning and understanding of the performance parameters for the aircraft and their part in assisting the pilot on the controls (P*) with effective crew communication. In this mishap, the crew coordination was poor with little assistance given to the P* on aircraft parameters and limits during the CMF maneuver by the PI and other crewmembers. To prevent poor outcomes during CMF, PCs should ensure they have done diligent planning for the mission by understanding the tasks that may be necessary and the aircraft performance in relation to those tasks.

A thorough crew briefing on the mission, aircraft performance, and crew communication during high task load maneuvers such as CMF should be utilized to ensure the mission is completed safely with full knowledge and assistance of all crewmembers. A thorough rehearsal of the mission and addressing the critical points due to environmental conditions during the mission is the most effective way to make sure the crew is prepared. ■

Class A - C Mishap Tables

	Manned Aircraft Class A – C Mishap Table									as of 28 Mar 21
	Month	FY 20					FY 21			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities
1st Qtr	October	2	2	4	0		0	0	10	0
	November	1	0	2	2		2	3	5	7
	December	1	1	2	3		0	1	5	0
2nd Qtr	January	0	0	5	0		1	1	6	3
	February	1	0	5	0		2	0	5	3
	March	0	2	4	0		1	0	2	0
3rd Qtr	April	0	1	1	0					
	May	0	0	6	0					
	June	0	0	6	0					
4th Qtr	July	0	2	8	0					
	August	1	2	7	2					
	September	0	2	8	0					
	Total for Year	6	12	58	7	Year to Date	6	5	33	13
	Class A Flight Mishap rate per 100,000 Flight Hours									
	5 Yr Avg: 0.94		3 Yr Avg: 0.99		FY 20: 0.63		Current FY: 1.63			

	UAS Class A – C Mishap Table								as of 28 Mar 21
	FY 20					FY 21			
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total
MQ-1	5	2	3	10	W/GE	6		2	8
MQ-5	0	0	0	0	Hunter				
RQ-7	0	14	21	35	Shadow		2	7	9
RQ-11	0	0	1	1	Raven				
RQ-20	0	0	1	1	Puma				
SUAV	0	0	0	0	SUAV				
Other	0	0	1	1	Other				
UAS	5	16	27	48	UAS	6	2	9	17
Aerostat	3	0	0	3	Aerostat	0	0	0	0
Total for Year	8	16	27	51	Year to Date	6	2	9	17
UAS Flight Mishap rate per 100,000 Flight Hours									
MQ-1C Class A	5 Yr Avg: 8.40		3 Yr Avg: 5.71		FY 20: 4.82		Current FY: 16.37		
RQ-7B Class B-C	5 Yr Avg: 67.23		3 Yr Avg: 78.53		FY 20: 107.19		Current FY: 98.83		

Forum

Op-ed, Opinions, Ideas, and Information

(Views expressed are to generate professional discussion and are not U.S. Army or USACRC policy)

NVG, Lost While at NTC

While conducting training at the National Training Center (NTC) in Fort Irwin, CA, my company and crew experienced some hair-raising landings. For the majority of the pilots (PI) and crew chiefs (CE), this was our first experience not only in the dust but a large amount of dust in the evening. We were fortunate enough to have a steadfast pilot in command (PC) at the time.

This event occurred on a red-illuminated night at the start of 2019. My company took five aircraft with seven crews to accomplish the mission. As soon as we arrived and settled in, we began validating our dust landings and refreshing our other PIs as well. We had a widespread of flight hours across our company ranging from 200 to 2,000 hours, but not many personnel with between 600 and 1,000 hours. We had two instructor pilots, an aviation mission survivability officer (AMSO), and one maintenance test pilot (MTP) with us. We also had two untracked PCs with less than 500 hours. Our company was given a chance to experience what our aviation survivability equipment (ASE) system looks like if our aircraft were engaged by enemy systems. We had to travel an hour away to begin this training which required refueling at a forward area rearm and refuel point (FARP).

Our first landing into the FARP was conducted during the day. We took five aircraft with us and were flying in formation. There was very little dust in the area where we landed and each aircraft landed safely. We conducted a safety briefing prior to departing and the hazards along the route of flight and proceeded to conduct the training for the day portion. During the second landing, Chalks 2, 3, and 4 all had to make a go-around due to Chalk 1 kicking up a dust cloud. It started to become dusk when Chalk 4 landed. We received a safety brief for the night portion of our training iteration and began to goggle up. We took off around 2145. We increased our separation of chalks from 2-3 disks during the day, to 7-10 disks at night due to visibility and our threat. As we approached our helicopter landing zone (HLZ), Chalk 1 was blinded by a light and missed the HLZ which caused every aircraft to miss their spot as well. Chalk 1 proceeded with landing in a different spot which caused more dust than earlier. Sequential chalks landed safely as well, but we could tell Chalk 1 and 2 had a rougher landing than they expected. We proceeded back to the FARP.

As we approached the FARP, there were no chemical lights to signal where each chalk needs to land. Chalk 1 and the flight conducted two go-arounds for that situation until Chalk 1 fully saw their landing area (Reason unknown to the flight, the FARP changed locations while we were training, which made it difficult to find on the return for fuel since we map marked the previous location). Chalk 1 landed safely, with Chalk 2 and the rest of the flight executing a go-around due to so much dust from Chalk 1 being kicked up. The flight made a second go-around and proceeded to allow dust to settle before Chalk 2 attempted to land. Chalk 3 and 4 laagered until Chalk 2's dust settled. Chalk 3 landed and Chalk 4 continued to laager. Chalk 4 was made up of a first lieutenant with about 200 hours, and the PC was an MTP with 1,300 hours and two deployments as a PI. The two CEs were experienced with over 300 hours each. As Chalk 4 was approaching into land, the right CE began to call the dust, "dust at the tail, dust at the cabin, oh f*^&."

That was the last thing heard from the CE. The aircraft was approximately 15 feet above ground level (AGL) and going 10 knots. The PC barely had the ground in sight and proceeded to land even though the CEs stopped talking. The PI had completed two dust landings prior to this landing. The left CE was calling drift but was not offering any other information verbally.

After the landing, the PC asked the right CE "what happened?" and questioned the left CE "why they were not talking?" We found out the NVGs belonging to the right CE had fallen off while he was calling dust and that's why he had cursed. The left CE was just sitting back in their seat and not looking outside. As they landed, the aircraft rolled forward and was within half a rotor disk of where Chalk 3 landed to the front.

The importance of the FARP became clearer that night. The flight could have gone differently if steps were made to reduce the risk, such as, but not limited to:

- Placing chemical lights out for each chalk to land to
- Ensuring CE are trained and do their jobs
- Awareness and execution of crew coordination within the cockpit and with total crew
- Planned contingencies if an aircraft had executed a go-around.

We realized that the NVG neck cord had worked and the importance of wearing it. The training prior to arrival at NTC was not adequate for dust landings due to our location and terrain at our local duty station. Having very little experience as PIs made this a higher risk and a lesson learned by everybody in the company.

CW2 Brett Brodersen

Blast From The Past: *Articles from the archives of past **Flightfax** issues*

VOL 5, NO 8 • 24 November 1976

Editor's Note: *This article from 1976 provides an insight into why Army aviation has an inadvertent instrument meteorological conditions (IIMC) procedure codified in the aircrew training manual. Inadvertent IMC is still a valid task for Army rotary-wing aviation operations today as our crews continue to operate in very demanding environments while executing their mission.*

Inadvertent Imc Procedures

Department of the Army (DA) Message 202037Z Oct 76: Subject: Inadvertent IMC Flight Procedures, is quoted for your information in Reference A below:

Reference A. Letter, USAAVNC (ATZQ-S-FS), 31 August 1976, subject as above.

This message is in two parts.

Part one is for all:

1. A review of 42 rotary-wing accidents resulting from inadvertent instrument meteorological conditions (IIMC) indicated that the most common reaction by the pilot was an attempt to regain visual meteorological conditions (VMC) without reference to flight instruments. Since IIMC is an unplanned event, most frequently occurring under the least desirable circumstances, low altitude and airspeed with the crew totally unprepared for instrument flight—it is essential that our aviators be properly trained in IIMC procedures.

2. Effective immediately the following constitutes approved DA procedures for immediate action by the pilot upon encountering inadvertent IMC:

a. Attitude indicator-level aircraft.

b. Heading indicator-maintain constant heading.

c. Torque meter-adjust to climb power.

d. Airspeed-establish climb airspeed.

e. IMC/instrument flight rules (IFR) flight recovery procedures-initiate only after transition to instrument reference is complete and aircraft has reached a minimum safe altitude.

3. Each major Army command (MACOM) will ensure an IIMC plan is developed at the installation level. Deputy for Standardization has developed a model plan which will be provided MACOMs per par. 6, this message will be the reference. MACOM plans should provide the following guidelines as a minimum:

a. Training requirements.

b. Validation of training.

c. Initial aircraft control procedures for IIMC/IFR flight as per par. 2a through d above.

d. IMC/IFR flight recovery procedures giving due consideration to factors such as single ship versus formation flight, geographical area (mountainous/ desert) and aircraft IMC capability. These procedures should, as a minimum, contain the following specific items of information:

(1) Initial altitude and heading for the purpose of providing terrain clearance or radar acquisition.

(2) Name and frequency of facility to be contacted.

(3) Transponder set to emergency (7700).

(4) All aircraft should be equipped at all times with the approach and instrument navigation charts appropriate to the local area.

4. Inadvertent IMC procedures will be reviewed and flight checked during the conduct of all standardization evaluation flights.

Part two for the commander, United States Army Aviation Center (USAAVNC):

5. Request Deputy for Standardization, USAAVNC, make this a matter of special interest during evaluation/assistance visits in FY 77 and FY 78.

6. Request recommended change to Army Regulation (AR) 95-1, Flight Regulations, paragraph 6, reference A, be included in the first programed revision of the regulation. Further, request model provided as an enclosure to reference A, be provided to all MACOMs for immediate MACOM distribution to all subordinate commands/ installations with aviation assets. ■

Mishap Briefs #100

Information based on preliminary reports of aircraft mishaps reported in March.

ROTARY WING

AH-64

E Model

- At 500 feet above ground level (AGL) the aircraft experienced an electronic digital engine control unit (EDECU) No. 2 failure resulting in an engine over speed, over temp and high rotor RPM conditions. An emergency landing was conducted at a nearby airport. There were no reported injuries. (Class A)

UTILITY

H-60

M Model

- While conducting initial entry rotary wing (IERW) training utilizing night vision goggles, the instructor pilot (IP) and student pilot were conducting a practice autorotation. The student entered an autorotation and flew the descent with no problems or abnormal indications. During power recovery, both engine RPM and rotor RPM increased as collective was applied. The IP directed the student pilot to conduct a go-around and as collective was applied, the engine and rotor RPM continued to build to approximately 107 percent. In the downwind leg of the pattern, the IP retarded the No. 1 engine power control lever (PCL) resulting in no change to engine or rotor RPM. The IP then took the aircraft controls and directed the student to retard the No. 2 engine PCL. Again, there was no change in engine or rotor RPM. The IP then declared an emergency and turned direct to parking. During the descent to parking, the IP continued to direct the student to retard both engine PCLs, in an attempt to reduce engine RPM, arrest an un-commanded yaw, and aircraft vibrations. At approximately 100 feet AGL, the student announced that both engine PCLs were at idle, the IP directed the student to place both engines back to fly for landing, and then conduct an emergency engine shutdown once on the ground. (Class C)

LUH-72

A Model

- While landing at a parking pad after an IERW instrument training flight, the crew of the aircraft experienced a hard landing on the pad. The aircraft suffered damage to the skids and skid cross tube. Damage to the skid support structure/former is unknown at this time. (Class C)

UNMANNED AIRCRAFT SYSTEM

MQ-1C

- During the takeoff roll, the unmanned aircraft system (UAS) ran off the end of the runway, striking the airfield fence, and split in half. The pre-accident plan was initiated and no injuries were reported. Emergency services were notified and dispatched. The hazardous material (HAZMAT) team was notified of a fuel leak. The UAS was a total loss. (Class A)
- The UAS engine and radiator were damaged due to improper maintenance practices. (Class C)

RQ-7BV2 Model

- The unmanned aircraft was on approach to land with no indications or faults. After successfully

landing and cutting engines, it took an immediate and sharp left turn off the runway and into the sod. Damage occurred to the aircraft due to the rough and partially uneven terrain on the shoulder of the runway. (Class C)

- A UAS was conducting a readiness level progression training flight. The approach and landing was conducted into the wind, to the north, and proceeded without incident. The unmanned aircraft touched down at the correct point on the landing strip centerline and proceeded down the lane. After passing the tactical automatic landing system, the aircraft drifted off the landing strip to the right and struck a high mobility multi-wheeled vehicle (HMMWV) parked nearby. The UAS sustained significant damage to the nose, fuselage, center and right wing. The HMMWV was not damaged and no personnel were injured. (Class C)

SURVEY

The United States Army Aviation Center of Excellence (USAACE) initiated a revised approach for preparing aircrews for emergencies, the Emergency Response Methodology (ERM) as described in the Flightfax 2020 Special Edition #2 issue. The ERM provides a logical approach for any emergency, emphasizes crew coordination, and prioritizes aircraft control above all else. The ERM also includes an update of the legacy "Green-Checklist" to the newly developed Flight Reference Cards (FRC). As implementation of the ERM is nearing completion the USAACE seeks to gather information on the readiness of operational aircrews to respond to emergencies using this new methodology. The USAACE has partnered with the United States Army Aeromedical Laboratory to deploy a web-based after-action review (AAR) to capture feedback from all Army aircrews. The QR code below will take the user to the AAR site and can be reached on any web-enabled device. The AAR data is collected anonymously and will be used to provide feedback about the ERM to the USAACE.

Flightfax

Online newsletter of Army aircraft mishap prevention information published by the U. S. Army Combat Readiness Center, Fort Rucker, AL 36322-5363. DSN 558-2660. Information is for mishap prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition. ***Flightfax*** is approved for public release; distribution is unlimited.

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TERRAIN FLIGHT

Terrain flight is an advantage Army aviation utilizes to overcome threat systems and remain in the fight. The current training aviation crew's conduct is designed to provide them with initial and continuation training on terrain flight techniques and principles which provide the experience and knowledge necessary to conduct missions successfully in large scale combat operations (LSCO) against integrated air defense systems (IADS.)

There are numerous tools available to assist the aviation team in becoming fully trained and mission qualified to operate successfully and safely during LSCO against a peer or near-peer threat. The ability to understand the mission and utilize appropriate terrain flight techniques are imperative to reduce the risk to mission and force.

Let's take a look at some information on terrain flight techniques and training to better understand what is available to Army aviation crews.

Army Techniques Publication (ATP) 3-04.1, Aviation Tactical Employment

Army Techniques Publication 3-04.1 states in paragraph 3-27: "Terrain flight is the fundamental element for mission success in a high-threat environment. Aviation units must use techniques that degrade the enemy's detection capabilities to survive and accomplish the mission. The most effective combination for detection avoidance is flying at terrain flight altitudes at night." Further, the ATP provides detailed information on how to plan, rehearse missions and execute terrain flight operations.

Terrain Flight Training Support Package (TSP)

The terrain flight TSP and other associated training documents are an invaluable resource provided by the Directorate of Training and Doctrine, Flight Training Branch. These TSPs can be accessed at this link:

https://www.us.army.mil/content/armyako/en/mycommunities/Home/groups/TRADOC/Groups/CAC/Groups/USAACE/Groups/USAACEStaff/Groups/Directorates/Groups/DOTD/Divisions/TrainingDivision/Branches/DOTDflighttrainingbranch/files.asset.html/content/usergenerated/asi/mongo/content/armyako/en/mycommunities/Home/groups/TRADOC/Groups/CAC/Groups/USAACE/Groups/USAACEStaff/Groups/Directorates/Groups/DOTD/Divisions/TrainingDivision/Branches/DOTDflighttrainingbranch/files/jcr:content/content/primary/library/tsps-Fqsc/terrain_flight_tsps-9SPS.html

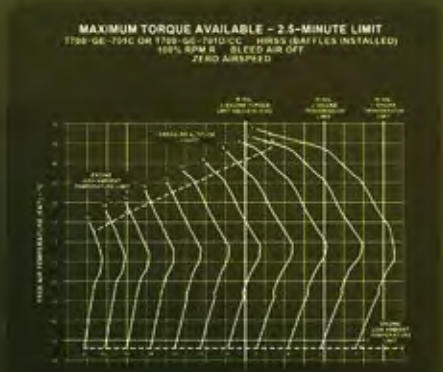
Reviewing the TSP provides leaders, instructors and aircrews with important information in validated training products that reduce risk and standardize operations across Army aviation. Products available from the Flight Training Branch are the Terrain Flight TSP, Terrain Flight TSP Student Handouts, Terrain Flight TSP Common Core, and H-47/H-60/H-64 Modules. These products provide the necessary information and tools units use to get their terrain flight training programs standardized and train their aircrews to fully mission qualified. Terrain flight is a hazardous environment not only due to enemy threats but also due to environmental and physical threats. Remember, step 1 to a successful mission is planning and hazard mitigations! ■

5 Questions

1. Is there any TSPs for terrain flight training? Yes/No?
2. Where can I find out more about terrain flight and other aviation training products?
3. Step 1 to a successful mission is making the landing zone on time. True / False?
4. What is the best method to avoid enemy detection in LSCO?
5. There is only one hazard associated with terrain flight, that's an IADS. True/False?

PERFORMANCE PLANNING

- Get ahead of the power curve



- High, Hot, and Heavy... *It's not a mystery*

- It's about Rotor RPM

Low rotor RPM. The Low Rotor RPM warning will flash at a rate of three to five flashes per second if rotor rpm drops below 96% RPM R. In addition, if % RPM R drops below 96% or Ng drops below 55%, a low steady tone is provided. The low rotor rpm tone is inhibited on.

- Your PPC, it's not your enemy

The P will compare the actual HVR performance data to the computed data on the PPC and announce the results to the P*. If "GO/NO-GO TQ" for the desired HVR height is indicated before reaching the planned HVR height used during performance planning, the P will inform the P* that OGE maneuvers cannot be conducted. The PC will confirm the "GO/NO-GO TQ" and adjust the mission, as required.

Note 1: The same PPC will suffice for consecutive takeoffs and landings when the load or environmental conditions have not increased significantly (5C, 1000 feet PA, or 1000 pounds).

Note 2: If environmental conditions throughout the flight will vary significantly, it may be necessary to compute multiple PPC's for the same flight.

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