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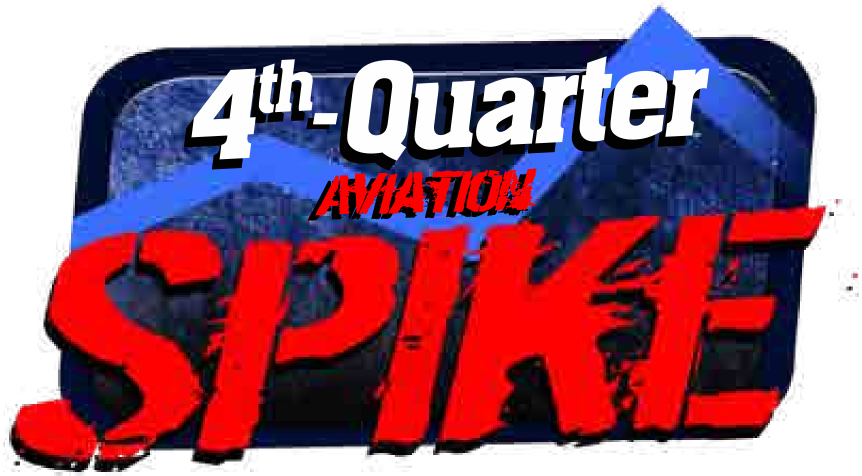
Success in Army Aviation Safety and the 4th Quarter Spike



During FY20, the Army continued seeing vast improvements in aviation safety, especially in Class A mishaps. For FY20, we recorded six Class A mishaps for the year, while still flying 90 percent of flying hours compared to FY19. This reduction from 12 to six Class A mishaps for the year is the direct result of commander presence and influence on outstanding Soldiers taking the appropriate risk management actions. Unfortunately, of the six mishaps in FY20, three were fatal and claimed the lives of seven Soldiers compared to two Army fatalities during FY19. The current manned Class A mishap rate for FY20 is .65 per 100K flying hours, the lowest rate and total number of Class A mishaps on record. However, while these statistics are promising, the Army must still continue to strive to improve safety through awareness and overall unit culture.

There are a number of comprehensive initiatives that contributed to this reduction. Among them are a campaign to address the 4th Quarter Spike in aviation mishaps that occurred over the past five years. Of all Class A mishaps from FY15 to FY19, 40 percent occurred in the fourth quarter, while flying hours remained relatively constant across the quarters. The USACRC and senior Army leadership embraced the challenge and launched an information campaign in March covering managing transitions, unit assessments, training management, environmental training, crew selection, fighter management, and maintenance. The Chief of Staff, Army endorsed this campaign with a message to the aviation force in June, reiterating the convergence of these complex factors. Additionally, we addressed both the Forces Command and Training and Doctrine Command commanders, who repeatedly reiterated and reinforced the importance of taking control of these risks through deliberate planning and action. By acknowledging and embracing these leading indicators, the outstanding, proactive approaches by commanders resulted in a significant reduction in mishaps throughout the year, despite the changing COVID-19 environment.

Through involvement of the full Army Aviation Enterprise, specific initiatives over the last two years include the Aviation Trends/Safety Brief the USACRC provides in person to aviation units and, amidst pandemic concerns, via MS Teams. Additionally, the U.S. Army Combat Readiness Center provides safety focused briefings during aviation pre-command, NCOES and warrant officer professional development courses. Furthermore, the U.S. Army Aviation Center of Excellence has developed and integrated Emergency Response Methodology Training designed to ensure appropriate responses to in-flight emergencies, an area that led to a number of catastrophic mishaps the past five years. The FY19 Class A rate sits 39.8 percent below the five-year average (1.08), and at 6.12, the current Class A-C mishap rate is 16 percent lower than the five-year rate (7.30). Working together, rapidly disseminating analyzed information, and focusing on the deliberate application of risk management at all levels resulted in these historically low mishap rates.

Many might attribute the drastic decrease in aviation mishaps to a reduction in operations brought about by the COVID-19 environment. However, throughout FY20, Army Aviation continued to fly almost 90 percent of the annual Flying Hour Program since 2015. Risk management at the battalion and company levels is the best mishap prevention tool available to the Army. The challenges associated with COVID-19 and maintaining readiness made commanders deliberate in their planning within all aspects of operations. Risk assessment and management was at the forefront of everyone's mind as we attacked this problem set.

The Army Aviation Enterprise has completed the many challenges of FY20 in great shape and is postured for success this year. We should all take pride in our efforts, but this is not the time to lessen our vigilance or assume we have a perfect system. We are at our best when we flatten comms, share information and trends (even when it hurts), and spot check critical functions to ensure adherence to the guidance we've issued. The USACRC exists to support you. Let me know what we can do to help with your loss prevention efforts. Fly safe!

People First – Winning Matters – Readiness Through Safety! ■

BG ANDREW C. HILMES
Commanding General

Aviation Decision Making

Aviation decision making, in and of itself, sounds like it should be rather cut and dry. We hear the term used frequently yet, we still often fail to make the best decisions while leading an aviation unit, briefing aviation missions, approving missions and also while behind the controls of an aircraft. Aviation is very intolerant of bad decisions or mistakes. Whether the decision is complex or simple, making a poor decision can rapidly escalate into a catastrophic sequence of events. The key to making good decisions is to understand that Army aviation operations require a holistic look at the mission, the crew, the aircraft, and possible complications that could be encountered.

The Mission

Each mission is different. While the task supporting the mission may be the same such as executing a sling load or engaging the enemy from a battle position, no two missions will have the same variables. The most important consideration for making good decisions is first making an informed decision whether the unit can execute the mission. This requires the leader to make the decision to review all the resources available and the variables that could impact the mission completion. Once the leader has the information and has reviewed it, he can then make an informed decision to accept or reject the mission. Here you can immediately see, while aviation units have matrices, charts and regulations citing hard numbers and directives, there is still a decision process that may move a "charted" acceptance of a mission to a rejection based on a variable or variables known at the time of the mission request or at the time the mission is slated for execution.

On the other hand, when a mission is accepted, the same informed decision-making effort must continue. The leader and aviation crewmembers must now develop the mission through planning, rehearsing and briefing. Once again, decision points develop as this process moves forward. During each phase, questions and variables surface. These are the decision points to which leaders and crewmembers apply necessary controls to negate or, in certain situations, cause a rejection/modification of the mission. Following the planning process, the mission should continue to resolve issues and mitigate risk through conducting a rehearsal.

The rehearsal, even with time constraints, is one of the most critical actions that can be taken to maximize shared understanding to enable leaders to make informed decisions. Following the rehearsal, the mission briefing should be finalized while understanding that there are branches and sequels which can occur with changes in variables. Variables that arise during the mission brief may not remain constant yet when identified as possibilities won't come as a surprise. Especially if the time from mission acceptance to mission execution is over a longer period of time. Conditions can change (enemy situation, weather, crews, aircraft availability, and fuel.) Mission briefing officers and approval authorities must be prepared to adjust fire on the mission brief and approval due to the very fluid nature of combat operations and combat operations training.

The Crew

The aircrew is the last dynamic in the decision-making process. The aircrew, from pre-flight through post-flight, is responsible for real-time decision making while the mission is in progress. The plan is the starting point and those Army aviation crewmembers who have flown for a while understand that once the aircraft leaves the ground and is in mission profile, variables encountered can be from small, such as a pair of night vision goggles failing to large such as an engine failure in flight while at max gross aircraft weight. While these variables may have been addressed during the planning and rehearsal process, aircrews must remain ready to make the right decisions based on the circumstances immediately in front of them. No book or regulation can cover every single possibility; aircrews will always be counted on to make the best decision based on the current circumstances. Training aircrews realistically and requiring them to make real-time decisions is the only way to strengthen their ability to respond correctly to unplanned events. Leaders can assist their aircrews on decision making by ensuring they are rigorously trained to make decisions through situational training exercises in the simulator and awareness, discussion, and collaboration.

The Aircraft

The aircraft impacts the decision-making process. Numerous mishap investigations have shown that many times the chain of events leading up to a mishap involves the aircraft, aircraft maintenance, or improper maintenance actions. Aviation missions don't happen without an aircraft, so the availability of an aircraft plays a role in the decision-making process. At all levels of maintenance and operations, leaders, planners, and aircrews are required to address aircraft as an integral part of their decision-making process. Some examples are:

Production Control- Decisions are made establishing the priority of efforts for aircraft maintenance. During high workload time frames, critical decisions are required to determine the availability of aircraft for missions. Decisions by the production control officer flow down through the maintenance sections requiring more decision making on the part of supervising noncommissioned officers (NCO) and enlisted maintainers. The amplification of production pressures to meet mission requirements continues to generate additional decision points from the start of a maintenance procedure, through the quality control inspection, and if necessary, the completion of a maintenance test flight.

Flight Operations- Decisions by the flight operations section on mission request acceptance generate follow-on decisions by creating the need to determine the best crew for a mission. Operations officers and NCOs are relied on to make informed decisions on what aircrew members to recommend to the commander who will provide the best outcome for a particular mission, this decision becomes more critical when missions are complex, require multiple aircraft, and when available crews are limited.

Possible Complications

Along each step in the mission execution process, there are possible complications. These complications typically result from one or more variables that can arise and create decision points from the assignment of a mission to the post-flight following mission completion. Each section of an aviation unit, whether they understand it or not, plays a vital role in making good decisions that culminate in the unit successfully accomplishing the mission. Poor decision making on the part of a refueler managing a hot refuel closed-circuit nozzle to a Black Hawk can result in a fuel fire and loss of an aircraft and injuries or death. Poor decision making on the part of the motor pool NCO can result in the unavailability of necessary vehicles to support logistics transport of critical aviation parts. Poor decisions by the pilot during an emergency procedure can result in a damaged or destroyed aircraft and injury to personnel. Poor decisions by a maintainer or a quality control NCO during aviation maintenance can result in aircraft damage or initiate the mishap sequence of the aforementioned failed emergency procedure.

The list of possible complications that can occur during aviation operations is unlimited. If units train their leaders and Soldiers on decision making and the implications of making poor decisions, each member of the aviation team will continue to improve their ability to overcome complications. No team member should believe they are not an integral part of the unit completing a mission safely. Leaders should integrate decision-making training into their unit training program with emphasis on the importance of each member of the team. It is just as important for a private first class in the refuel section as it is for the CW4 standardization instructor pilot to understand decision making and its influence on the operational safety of the mission.

Conclusion

Understanding the mission, the crew, the aircraft, and possible complications that could be encountered allows the commander to structure unit decision-making training which assists in mitigating the risk of poor decisions. To reduce aviation unit risk to mission and force requires the commander and leaders to look at the aviation unit holistically and understand that every member of the unit makes decisions that impact the mission. Unit personnel should be trained on decision making and how important proper decision making is to reduce mission failure, aircraft damage, personnel injury and death. ■

Aviation Division
Directorate of Assessments and Prevention
United States Army Combat Readiness Center

Maintenance Considerations in Hot Environments

As temperatures start to rise you can expect less performance from your aircraft and the people around you. Heat injury prevention measures in Technical Bulletin (TB) Medical (MED) 507/ Air Force (AF) Pamphlet 48-152(I), Heat Stress Control and Heat Casualty Management, are effective in aircraft maintenance operations and apply anywhere Soldiers could be exposed to heat stress. Excessive heat stress will degrade mental and physical performance capabilities and eventually cause heat casualties.

Heat stress slows reaction times, decision times and routine task performance. Heat categories are associated with a wet bulb globe temperature (WBGT) that is monitored at the location where work is being performed. The WBGT can vary greatly over short durations and distances in unpredictable ways, so a centralized wet bulb globe thermometer should only be used as a guide. Table 3-1 in TB MED 507 provides necessary water intake and ratios of work/ rest for easy, moderate, and hard work for each wet bulb category. Remember to read the notes below the table to see if they apply to your situation and apply them appropriately. In extreme temperatures scheduled and unscheduled maintenance may need to be performed at night to bring the risk down to an acceptable level.

Maintenance Test Flight (MTF) Considerations in High, Hot, Heavy Environments

1) High, Hot, Heavy Impacted Maneuvers to be performed along with altitude for safe operation/recovery.

CH-47

There are a few considerations for CH-47s in high, hot, and heavy conditions. Obviously, it is paramount to have a properly computed performance planning card (PPC) prior to any MTF. In high, hot, heavy conditions, the PPC will be your first indicator of some limitations that may exist prior to executing the MTF. Power becomes the limiting factor in this type of environment, and that translates itself to lower than normal airspeed limits and high autorotational rotor speeds. Speed sweeps checks and the autorotational RPM check will be the primary flight checks affected by this type of environment.

AH-64

The primary concern is the autorotational RPM check. Besides commonly having to conduct an alternate RPM check, the recovery generally takes more altitude due to a more methodical and slower manipulation of the flight controls. Briefers should ensure the maintenance test pilot (MTP) is aware of PPC limits and ensure the MTP is using an appropriate altitude for the maneuver.

UH-60

Power management during maintenance checks: Maximum engine power check, autorotational RPM check, Vibration and vibration absorber (AB) tuning (The propensity to reach turbine gas temperature (TGT) limiting rapidly as the cause of maximum power availability during high, hot and heavy conditions); rapid increase of rotor RPM during autorotational RPM checks (expected RPMR over 120) especially with wide cord blades.

2) Configuration of aircraft (can you gain power margin by changing configuration).

CH-47

In accordance with (IAW) Technical Manual (TM) 1-1520-271-MTF, the aircraft configuration should be determined prior to each MTF in order to determine performance parameters. Clearly, the best way to combat this type of environment is to decrease one of the variables limiting performance. Given any specific environment at a given time, the only options an MTP may have are to reduce gross weight or wait for more favorable environmental conditions. In accordance with TM 1-1500-328-23, Aeronautical Equipment Maintenance Management Procedures, cargo and nonessential passengers are prohibited on all MTFs. Maintenance test pilots may need to evaluate the configuration of the aircraft and remove nonessential mission equipment (e.g., Extended Range Fuel System (ERFS).) Additionally, MTPs can limit the fuel in the tanks to only that which is needed to conduct a short limited maintenance test flight (LMTF) or burn fuel to attain a more desirable aircraft gross weight prior to attempting the checks in question.

AH-64

The AH-64 MTP should consider fuel required for the mission and possibly only take fuel required to complete the autorotational RPM check and then refuel if necessary for the remainder of the MTF. Also, reducing weight by removing wing stores is a good technique to increase the margin of power required vs. power available.

UH-60

As stated above, cargo and nonessential passengers are prohibited on MTFs. Removing ERFS and utilizing less internal fuel will increase power margin.

3) Time of day (day vs night) and benefits.

All MDS

The least demanding mode of flight (day) is the ideal mode to accomplish MTFs, however, certain environments and theaters may dictate the need for night/night vision goggle (N/NVG) MTFs. Maintenance test pilots can plan to reduce risk due to the high temperatures experienced later in the day by executing early morning MTFs which decreases the need to plan for conducting MTFs during N/NVG flights.

4) Seasonal considerations.

All MDS

In high, hot, and heavy environments, it is common to be unable to verify what rotor RPM the aircraft stabilized at during the autorotational RPM check due to the limit being reached for maximum autorotation rotor speed as per the MTF checklist. Maintenance test pilots can make use of the cooler months in the winter to verify any aircraft that had an autorotational RPM check completed during the summer months or in a high, hot, and heavy geographic location the unit was deployed to. This will allow the MTF to provide a stabilized autorotation RPM verification prior to operating in an environment where environmental factors yield a target value outside of permissible limits.

Summary

Higher temperatures bring increased risk to maintainers, aircrews, and reduced performance from aircraft and personnel. When extreme temperatures force maintenance actions to be performed at night, more vigilance is required from everyone involved. Leaders must ensure controls are in place to reduce risk to the lowest level possible. Maintainers must adjust work cycles to provide the maximum maintenance while protecting the force. And aircrews must apply high, hot, and heavy risk controls into their mission planning to complete MTFs. ■

References:

Army Techniques Publication (ATP) 3-04.7, Army Aviation Maintenance (September 2017)

Technical Manual (TM) 1-1500-328-23, Technical Manual Aeronautical Equipment Maintenance Management Procedures (June 2014)

Technical Bulletin (TB) Medical (MED) 507/Air Force (AF) Pamphlet 48-152(I), Heat Stress Control and Heat Casualty Management (March 2003)

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Balancing Risk and Training Demands

While conducting a night familiarization gunnery, the AH-64 instructor pilot (IP) on the controls in the pilot's (back) crew station successfully recovered from a diving rocket fire engagement at 750 feet above ground level (AGL). During the subsequent left 180-degree turn the aircraft developed an unusual attitude and rapid descent rate and impacted the ground at greater than 120 knots in a nose-low attitude with an 11 degree left bank at nearly 4,000 feet per minute rate of descent. The crew suffered fatal injuries and the aircraft was destroyed.

"Crawl, walk, run" has been a constant mantra in the development of training strategies for units to attain proficiency in their unit's mission. It is also the building blocks used in aviation for individual and crew proficiency. Deviations from this strategy can lead to increased risk in the training cycle. As with all risk management, commanders must weigh the risks with the potential benefits in determining a course of action.

Personnel Challenges

In reference to this mishap, the unit had recently been assigned more than a dozen new aviators of which half were first assignment flight school graduates. Designed to bring the unit up to adequate manning levels for an upcoming deployment, the influx of new personnel required the unit to devote additional time to readiness level (RL) progression training for the new pilots (PI). In addition, many of the new aviators arrived after most of the major training events had been completed, including aircraft gunnery. In order to ensure the new aviators had the opportunity to fire the aircraft weapon systems before deployment, additional aircraft gunnery was scheduled and a waiver was processed to train RL3 aviators on gunnery skills, day and night, prior to the deployment.

Crew Experience

The mishap IP had more than 1,800 hours of flight time. The PI had 162 hours. This was the third flight for the PI since graduating flight school. The gunnery familiarization, day and night, was briefed as low risk.

Weather

The weather forecast called for visual flight rules (VFR) conditions throughout the mishap crew's flight period. Winds were forecast from the north (360 degrees) at 12 knots, gusting to 18 knots, 6 statute miles visibility with light rain showers and ceilings overcast at 3,500 feet. There was no turbulence or icing forecast during the period. Pilot reports (PIREPS) indicated that the ceilings in some areas were approximately 700 feet AGL with 2 miles visibility. The winds were actually gusting to approximately 25 knots, which was corroborated by other aircrews and the range personnel. The illumination was 0 percent as the moon was not scheduled to rise during the range period.

Summary

The mishap IP failed to maintain control of the aircraft during the left turn following the engagement and failed to detect the unusual attitude and rapid descent rate that had developed during the mishap sequence. The same left turn was executed several times with the first period PI and subsequently with the mishap PI, without incident. The mishap PI's responsibilities would have been focused inside the aircraft during the left turn to annotate the target handover, enter the target into the tactical situation display and then relay target information to the PI.

Lessons Learned

Several factors, when collectively presented, should be considered when a risk assessment is being developed or as conditions change during the conduct of a mission. Waivers to a standard operating procedure would warrant consideration for increased risk and appropriate mitigation. With the cited mishap, the use of an IP with an RL3 PI was required and appropriate. But it also highlighted the mishap PI's inexperience in the aircraft, especially at night. Generally, night operations entail increased risk. This lack of experience coupled with increased workloads associated with gunnery tasks may have hindered the PI's ability to assist the IP in airspace surveillance. Even crew coordination factors such as professional courtesy and overconfidence in the IP's ability could delay a PI's response when confronted with a deviation in the flight path. Additionally, operating at night with low illumination, lack of a visible horizon and minimal cultural lighting associated with impact areas required the crews to increase focus on flying the aircraft.

Conclusion

In the conduct of developing the mission risk, all personnel associated with the mission briefing/approval process must ensure the appropriate risk elements are addressed and mitigation is applied in the risk reduction effort. Utilizing the Army Aviation (Standardized) Risk-Common Operational Picture (R-COP) and assessments address key areas to evaluate. Further evaluation of the interaction between the key areas can yield additional areas of attention to be addressed. Taking an active role and identifying how the interactions may increase risk and instituting controls can prevent mishaps from occurring. ■

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Adaptive Power Management

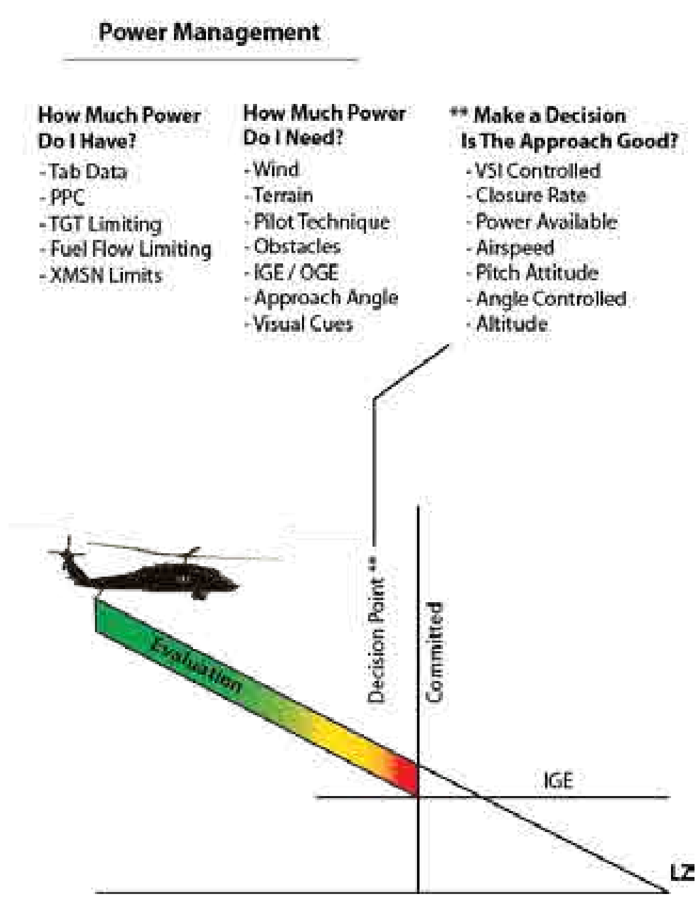
"In the struggle for survival, the fittest win out at the expense of their rivals because they succeed in adapting themselves best to their environment."

Civilization Past and Present (Wallbank, Taylor, Bailkey)

The above quote, often incorrectly attributed to Charles Darwin, identifies perhaps the most critical attribute one must master for subsequent survival, and aviation is no exception. Throughout an aviator's professional flying career, one thing becomes evident: the best aviators are the ones who can adapt to an ever-changing mission set and respective environment. We have all heard the statement, "That's not the way we did it at my last unit." or, "That's not how we did it in Iraq." The veteran aviator's wisdom realizes upon exiting said environment or mission set, it is time to refresh the proverbial memory cache upon entering a new environment. It is essential to highlight, this does not mean deleting previously used tactics, techniques, and procedures – one must file them away for inevitable future use.

Power management, a term coined at the High-Altitude Army Aviation Training Site (HAATS) circa 1985, was defined as knowing how much power is required for a specific maneuver, how much power is available and then making a decision to continue or abort. Power management training methodology is not immune to the necessity of adaptation of an ever-changing and dynamic aviation mission set. Upon its inception, the landing zone (LZ) Sequence (now called the Approach Takeoff Sequence or ATS) developed at HAATS focused primarily on a "four torque" evaluation system. "Target Torque" was predicted and used to objectively assess an aviator's ability to conduct accurate wind/terrain analysis as well as their ability to manipulate the flight controls to achieve a properly power-managed approach and takeoff. This training's overall objective is to dramatically increase an aviator's situational awareness (SA), thereby maximizing any airframe's utility and capability. Through the years, HAATS recognized the need for adaptation as our aviators entered two primary combat theaters. One example is aviator fixation on "target torque" as a rigid, inflexible power value, which led to its removal from the LZ sequence – a necessary evolution for the power management program of instruction (POI). See the June 2003 Flightfax, Power Management – What is it? The article sets the foundation for which HAATS has built upon.

Today at the HAATS, the ATS continues to adapt and evolve. One example of this is the recognition during the training of operations in the degraded visual environment (DVE). Before the approach, aviators discuss the effects of LZ-specific surface conditions (i.e., snow, dust) and apply necessary power adjustments to the predicted hover in-



U.S. Army Sergeants Steve Skramstad (left), John Cerda (middle left), Roger Smith (middle right) and Anthony DiSalle (right), UH-60 Blackhawk Crew Chiefs stand in front of one of their airframes at the High Altitude Army National Guard Aviation Training Site, Gypsum, Colo., April 17 2019. HAATS trains 300-400 students a year about power management on various airframes. (U.S. Army National Guard photo by Spc. Michael Hunnisett)

ground-effect torque value. With the evolution of advanced aircraft DVE mitigation systems (H-64, H-47, H-60) HAATS continues to adapt flight techniques resulting in maximization of aircraft payload/utility.

Another adaptation the HAATS continues to develop is the continuous evolution of combat maneuvering flight (CMF) and energy maneuverability or energy management (EM) program of instruction. While instruction at the HAATS began primarily as a "lift-centric" methodology, the scout/attack community now benefits from a burgeoning POI adapted to high-density altitude considerations for CMF and EM. Instruction developed in concert with U.S. Army experimental test pilots (XP) and instructor pilots (IP) from Marine Aviation Weapons and Tactics Squadron One (MAWTS-1) continues to evolve, providing today's rotary-wing aviators an ever-expanding tool kit to pull from. Aerodynamic principles and concepts such as energy theory and energy conservation are just a couple of new tools to acquire and hone.

The HAATS now offers an expanded POI for the non-rated crewmember (NRCM) in continuing to adapt and evolve. While conducting flight training at the HAATS, all aircrew members currently operate in precisely choreographed tasks and maneuvers with underpinnings firmly planted in the principles and objectives of aircrew coordination training (ACT). One such offshoot from this is the Hoist Master Program, currently being developed and a new hoist training facility being budgeted. To better serve the military aviator community, the HAATS will be offering the HAATS "App." This will contain the lesson plans, flight training guides (FTG), and ATS cards and other pertinent information related to the current courses of instruction and views from the field.

Throughout the years of classes at the HAATS and the mobile training teams conducted by the power management instructors, an ever-evolving POI continues to make aircrews more situationally aware, which is to say safer and more capable for our customers on the ground. See Flightfax April 2004 Knowing Your Enemy, another past article that is just as relevant today. Teaching never stops, even outside the classroom. Just the other day, I was approached by a junior Army aviator who had not yet been to the HAATS. He stated, "I can't wait to go; basically, I hear you guys want us to land and take off with the least amount of power possible." This statement is probably the most common one paraphrased by the uninitiated. I respectfully corrected this statement to, "We will dramatically increase your overall SA, and have you take off, maneuver, and land using the appropriate amount of power, thereby maximizing the utility of your airframe." I then recounted a vivid example of a dusty DVE takeoff conducted after a point-of-injury pickup while operating in the Helmand province on my most recent Afghanistan deployment. Minimal hover in-ground-effect (HIGE) power, while enough to depart, is not prudent or appropriate for the DVE departure. "Ahhh," the junior aviator stated.

Adapting and evolving when it comes to training as an aircrew member should never stop. ■

For more information on the HAATS or current training programs please contact us at DSN 250-5401 or visit our website at https://co.ng.mil/About/Schoolhouse-HAATS/.

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Standardization Instructor Pilot
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Instructor Pilot
High-Altitude Army Aviation Training Site

Esper Message

Every few months someone in the field requests clarification of Army Directive 2018-07-14 (Prioritizing Efforts-Readiness and Lethality Update 13.) The purpose of this directive was an adjustment to all mandatory training requirements with several safety requirements being rescinded. I hope to clarify the message and help those in the field better understand the purpose and intent behind this message.

In an effort to streamline command requirements, Army policies are often modified or sometimes rescinded when they become obsolete. When this happens, it can be perceived as ambiguous to personnel in the field, causing some confusion. Some may think the change is bad or it could lead to an increase in risk or responsibility in ones' daily duties. Commanders have the discretion to continue policies if a policy is necessary to maintain a level of certain risk mitigation based on the unit mission. Commanders are still responsible for the safety of human and materiel resources and remain the final mission approval authority when it comes to risk. Here are a few examples:

Safety Meetings:

Safety meetings are no longer required, yet units are encouraged to share safety information with their formations. Commanders and safety professionals have the ability to get creative and still share the safety message. Whether you post the message on a safety board or slide it into another meeting, units can disseminate safety information.

Safety Philosophy:

A written commander's safety philosophy, may no longer be required, but every Soldier should know how his commander thinks about safety. Safety should be embedded into every aspect of the unit's training plan and disseminated to every Soldier. Just because something is not written doesn't mean it isn't present. A philosophy is a way of thinking, not a piece of paper telling you what a commanders' thoughts are on safety.

FOD Officer/NCO:

The foreign object damage (FOD) officer or noncommissioned officer (NCO) position may have disappeared, but not as a program. A unit's aviation safety officer (ASO) will have to pick up this responsibility to ensure the program remains afloat. The FOD program is also a function of every individual that steps onto the flight-line. I encourage every individual to remain vigilant and assist the ASO in keeping FOD an elevated concern of each Soldier of aviation units. Of particular note is in maintenance operations and around the maintenance facilities.

Summary:

As our Army becomes a leaner force, we must remain observant in our ever-changing environment. Spread the safety message, think outside the box, and step up when it comes to safety. Just because a safety requirement was modified or rescinded doesn't mean it isn't needed, it just provides the commander with the ability to battle focus his safety program. ■

References:

Army Directive 2018-07-14 (Prioritizing Efforts-Readiness and Lethality Update 13)

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Mishap Review: *B350 Improper Emergency Procedure Actions*

While performing mission tasks, the aircrew noticed smoke rapidly inundating the cockpit. Prior to the smoke obscuring the pilot's vision, he noted a high inter-stage turbine temperature and an oil pressure of zero pounds per square inch (PSI) and shut down the No. 2 engine. The No. 1 engine was then identified as failing and was pulled to idle. The crew conducted a wheels-up landing in a field. The accident resulted in severe damage to the aircraft with no injuries.

History of Flight

The aircraft departed a location in Iraq and climbed to the initially assigned altitude of 21,000 feet mean sea level (MSL), and began the assigned mission. Several hours into the flight, the crew reported thick smoke in the cockpit, which impaired their visibility of flight instruments and anything outside the aircraft wind screens. The master warning illuminated, a high inter-stage turbine temperature (ITT) and an oil pressure of zero PSI. Based on a crew assessment, the No. 2 engine was shut down. Immediately afterward, the crew reported observing flames shooting out the No. 1 engine exhaust stacks and heard loud, sharp reports. The master caution advisory panel displayed the No. 1 engine chip caution light. The crew began to shut down the No. 1 engine. The crew initiated a glide to the departure airport and touched down wheels up in a large field just outside of the airport surrounding the city.

Crewmember Experience

The pilot in command had 309 hours in MTDS and 1,726 hours total time. The pilot had 455 hours in MTDS and 14,000 total hours.

Commentary

While responding to an in-flight emergency, the crew shut down the wrong engine, subsequently turning the situation from a single-engine failure to a dual-engine failure. Multi-engine aircraft engine malfunctions aren't always clear when each engine malfunctions. Crew actions should be completed in accordance with the emergency response methodology. This will provide the aircrews with the steps necessary to successfully manage the emergency and provide the best outcome for the aircrew. When one engine malfunctions and the second engine picks up the load, there is no guarantee that the engine picking up the load won't malfunction. This crew was forced to make a power-off landing into a field when they shut down the No. 1 engine. The emergency procedure event was exacerbated by the cockpit filling with smoke, making it hard for the crew to identify the malfunctioning engine. However hard to identify, shutting down the wrong engine amplifies an already dangerous in-flight emergency. Aviators must be aware of critical emergency procedures and utilize synthetic flight training simulators to maintain their piloting skills through tough, realistic emergency procedure training. ■

Class A - C Mishap Tables

Manned Aircraft Class A – C Mishap Table as of 22 Feb 21

	Month	FY 20 Class A Mishaps	FY 20 Class B Mishaps	FY 20 Class C Mishaps	FY 20 Fatalities		FY 21 Class A Mishaps	FY 21 Class B Mishaps	FY 21 Class C Mishaps	FY 21 Fatalities
1st Qtr	October	2	2	3	0		0	0	10	0
	November	1	0	2	2		2	3	6	7
	December	1	1	2	3		0	1	5	0
2nd Qtr	January	0	0	5	0		1	1	5	3
	February	1	0	5	0		1	0	0	3
	March	0	2	4	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	6	2					
	September	0	2	7	0					
	Total for Year	6	12	55	7	Year to Date	4	5	26	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: 1.31

UAS Class A – C Mishap Table as of 22 Feb 21

	FY 19 Class A Mishaps	FY 19 Class B Mishaps	FY 19 Class C Mishaps	FY 19 Total		FY 20 Class A Mishaps	FY 20 Class B Mishaps	FY 20 Class C Mishaps	FY 20 Total
MQ-1	5	2	3	10	W/GE	5		1	6
MQ-5	0	0	0	0	Hunter				
RQ-7	0	14	21	35	Shadow		2	4	6
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	5	2	5	12
Aerostat	3	0	0	3	Aerostat	0	0	0	0
Total for Year	8	16	27	51	Year to Date	5	2	5	12

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: 15.93
RQ-7B Class B-C	5 Yr Avg: 67.23	3 Yr Avg: 78.53	FY 20: 107.19	Current FY: 93.82

Forum Op-ed, Opinions, Ideas, and Information

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

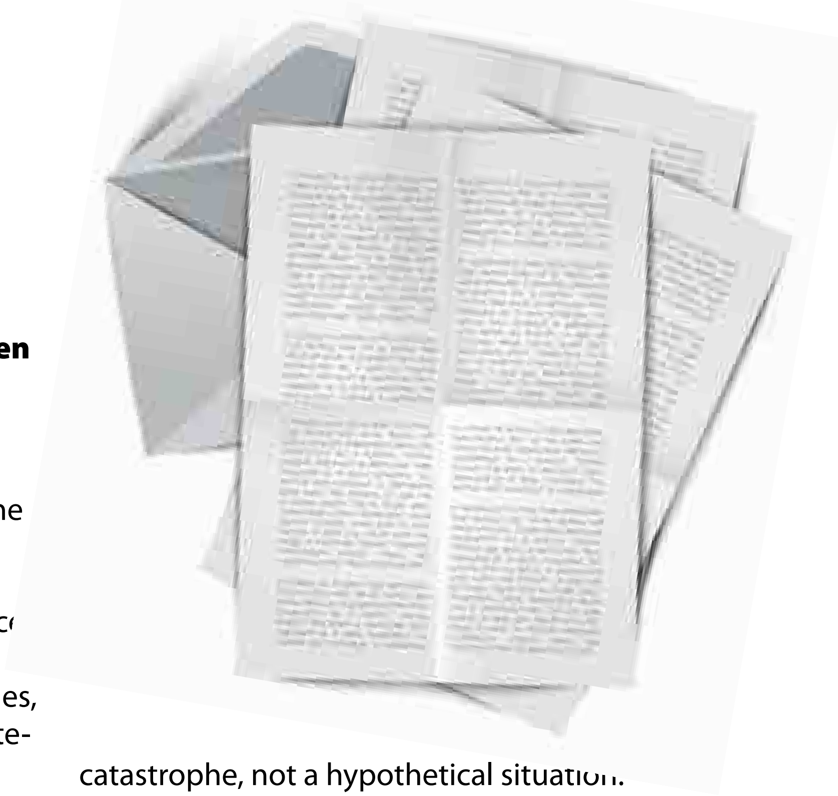
Letter to the Editor

As I was reading Flightfax #98, "When It Wasn't Written-Up in the Logbook" article, my heart sank as I read a complete aircraft loss and all aircrew fatalities. I forgot the article was written hypothetically as I was caught up in the scenario that probably happens more often than we know.

As maintainers, leaders, and pilots, we feel the pressure of carrying out the mission, so we are pressed to troubleshoot and fix the problem on the spot. Success! Time to go! Documentation takes time, and since it was only an isolated incident, why waste time? Now, with electronic maintenanc documentation, and electronic logbooks, we are faced with additional challenges of computer issues, migration issues, or maybe even "I'll make the write-ups later." Unfortunately, we get sidetracked and forget, or it's late so I'll get to it tomorrow, or we just come back to an isolated incident.

As a CH-47 maintainer turned flight engineer turned technical inspector, I have learned through many mistakes, not all of which were my own, that if the maintenance is not documented, it didn't happen. As it was mentioned in the article, we lose the historical data of a fault. In many cases, we lose a written history to aid in further or deeper troubleshooting. That single fault may not seem important now but may eventually develop into a safety of flight issue. Did we really fix it? Did it really fix itself?

The other day I watched an airworthiness training video sent out by Corpus Christi Army Depot (CCAD), Maintenance Engineering Division and a term was mentioned. "Normalization of Deviance," which is accepting things as normal, even though it wasn't supposed to happen. It causes a little concern the first time, then it happens again, again, again, and finally develops into well, that's just what happened. We often refer to it as it always does that, or it happens all the time. Unfortunately, these faults do not fix themselves, and if we do not take the time to track it, in writing, it may become an actual



catastrophe, not a hypothetical situatio

I sent in an article to Flightfax not long ago, "Sloppy Records is Sloppy Maintenance," Flightfax #91. In my article, I wrote of documenting maintenance and establishing a history with a single fault. Some folks do not realize how much of a difference entering a single fault can make.

Now, as an instructor of Army aviation maintenance, I make it a point to my students about how important it is to document what happened (the fault) and what we did to fix it (related maintenance with a corrective action). We can never write too much.

In closing, my thanks to the Aviation Division for catching my attention with the article, and the relief that it was hypothetical. Unfortunately, we are in a dangerous business and everyone who supports this business is an integral part of the team. I hope and trust that all who read the article take it to heart and think twice the next time they ask themselves or their supervisors "should we write this up?" ■

Michael Ward
Academic Instructor
Special Applications Group
Eastern Army Aviation Training Site (EAATS)

Proper Tool for the Job

As young Soldiers and mechanics, we don't often think or plan what we are about to do, and we don't think about the consequences; we just want to please our boss and get the job finished. How many times have we put tools in our tool bags, walked out to the aircraft to do a task, then realize we forgot our screwdriver? No worries, I'll just use my knife! Even better, I'll use my multi-tool; who needs a tool bag.

Multi-tools have been around a long time, but do not belong on an aircraft. When I was working the flight line, and even now as an instructor, I see the use of the multi-tool all too often.

Before I share two life events, we can refer to TM 1-1500-204-23-9 General Aircraft Maintenance (Tools and Ground Support Equipment).

2-4 TOOL SELECTION.

The selection of the proper tool or size of tool to fit the job is of prime importance. Using a tool not suited for the job or the incorrect size can result in damage to the tool, damage to equipment being maintained, or injury to maintenance personnel. Proper choice of tools enables the mechanic to perform his work quickly, accurately, and safely.

2-7 TOOL SAFETY.

A tool may be efficient, essential time-saving, and convenient. It can also be dangerous when used incorrectly. ALWAYS use tools only for the purpose for which they are designed. In addition to this requirement, observe the following practices:

a. Inspect tools and equipment for unsafe conditions before starting work.

b. Wear proper clothing and protective equipment.

c. Mark and remove from service all unserviceable tools.

We often see screwdrivers used as chisels and pry-bars, and pliers used to disconnect electrical cannon plugs.

8-3 TORQUE WRENCH SELECTION.

The appropriate torque wrench can be selected for a specific job, based on the type desired, the range of the tool, and the appropriate torque units. Verify counter clockwise (CCW) calibration and currency of torque wrenches for CCW torque installation. Refer to GEN-MIM-09-004 Bidirectional Torque Device Calibration Requirement, and your Army TMDE Support Team (ATST) facility for additional information. That may be new to most folks and what may also be unknown or just forgotten is 8-3, subparagraph b. Range. When selecting a torque for a particular application, the range of the torque wrench must be considered. When practical, the required torque value should be between the 30- and 80- percent points of the torque wrench range. The accuracy of most torque wrenches tends to decrease at the extremes of the torque range. The best accuracy is obtained between the 30- and 80- percent points of the range. The

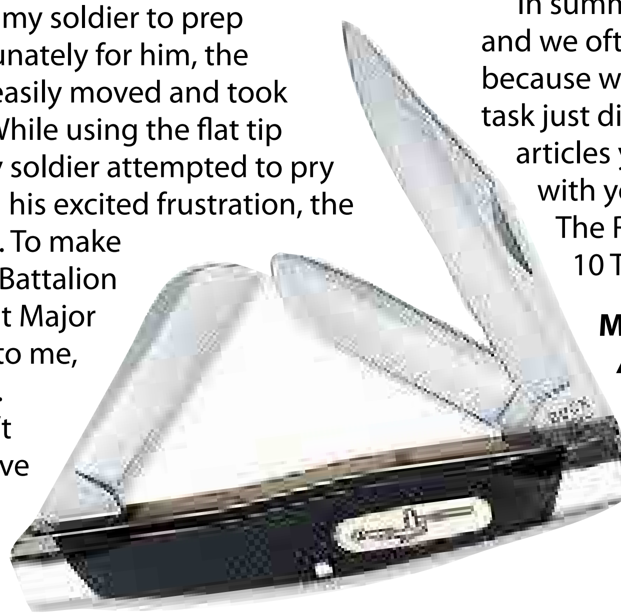
Table 8-1. Torque Tool Accuracy Limits

Test instrument parameters	Performance specification
Torque Wrenches	Range: 0 to 1000 foot-pounds Accuracy: (±4 percent) of reading from 20 percent of full scale to full scale.[1]
Torque Screwdriver	Range: 0 to 100 inch-pounds Accuracy: (±3 percent)

[1] No accuracy requirement from 0 to 20 percent of full scale or wrench

graduation increments on the torque wrench should not be greater than 10 percent of the torque value being measured. Table 8-1 references the accuracy limits for torque tools.

Some of you may remember the knife that used to be part of the toolbox issue. It had two blades, one with a flat tip and a locking feature. As a squad leader, I was tasked to remove two CH-47D engines in preparation for Phase Maintenance. As usual, I used the opportunity to provide some maintenance training. Following the technical manual, prior to raising the engine, I demonstrated the use of the aft link to slide the lower hat bushing away from the bearing, allowing me to swing the link out of the mount lug. We transition to the second engine, and I allow my soldier to prep the engine. Unfortunately for him, the bushing wasn't as easily moved and took some persuasion. While using the flat tip blade of a knife, my soldier attempted to pry the bushing, and in his excited frustration, the blade cut his finger. To make matters worse, the Battalion Command Sergeant Major was standing next to me, during the training. I'll just say he wasn't amused. Should have been a "Lesson Learned."



Fast-forward three years, I'm now a technical inspector and assisting with an aircraft daily in preparation for CH-47D track and balance. I grew up on a farm and always carried a knife. I'd been carrying a three-bladed knife in my pocket for over ten years, and I have turned hundreds if not thousands of Camlocks and Dzus fasteners with the spear tip blade without incident. This day, however, while unlocking a clam shell door Camlock, the blade folded very quickly on my thumb. The crew chief was inside the aircraft, and when I let out my painful OUCH, accompanied with colorful words, he exited the aircraft quickly. Fortunately for me, he was a recent graduate of the Combat Lifesaver Course, and to my surprise, he had his bag on the aircraft. He bandaged my thumb, but he could not treat my embarrassment.

The wound has since healed but the memory remains, and when I see Soldiers use a knife to open aircraft panels, I don't mind sharing my story.

In summary, we tend to take tools for granted, and we often use them incorrectly for convenience because we didn't plan properly for the task, or the task just didn't go as planned. Check out the two PS articles you can share while training or talking with your Soldiers and mechanics: PS 652 Mar 07 The Right Way is the Only Way and PS 696 Nov 10 The Pocket Tool. ■

Michael Ward
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Eastern ARNG Aviation Training Site (EAATS)

Unforecast Weather Decisions

Most people think of summer as a time with beautiful weather and vacation, but in many parts of the World, summer brings thunderstorms, low visibility, low ceilings, and heavy rain. There have been multiple occasions where unforecasted weather has caused flight crews to make bad or marginal decisions. The question is how do we train for those situations and how do we mitigate the risk of running into inclement weather.

The obvious answer is to get more weather updates and to utilize all of the tools available to us. Unfortunately, there are still circumstances when our weather forecasters are unable to see the inclement weather on their sensors. Getting into low ceiling and low visibility can sneak up on pilots, especially at night due to the ability of night vision goggles (NVG) being able to see through some of the low visibility. Crew coordination and pre-mission planning are crucial factors that will save an aircrew's life in these dangerous situations.

Last summer, a flight of three was conducting a mission that took them to the north about 200 miles to their fuel stop. Pre-mission planning was thoroughly conducted and the flight was going to land at their first fuel stop with over twice their visual flight rules (VFR) reserve. Prior to departure, the flight received an updated weather brief. The weather was forecast to have a line of low ceilings and low visibility well to the east of the flight route, and it was not forecast to hinder the mission. The flight took off at end of evening nautical twilight (EENT), which is approximately 45 minutes after sunset and it is dark enough to fully utilize NVGs.

Approximately five minutes after departing the airfield, the lead aircraft saw a wall of about 300 feet ceilings with no way around the weather. Lead contacted the tower and informed them that they would need to return to the airfield. The tower operator informed them that they could vector the flight through a break in the inclement weather, but the lead aircraft did not see any possible holes in the weather and decided to return to the airfield and wait until the weather passed.

The flight landed at the airfield, contacted weather, and was informed that it would be about a 30-minute delay until that system cleared to the west. The flight again departed once that specific system cleared our route and proceeded on course. Once the flight was en-route, they realized that the original system had moved west faster than was briefed by the weather personnel. The flight was about halfway to their first fuel stop when the weather started to deteriorate again.

The pilots in command (PC) of the aircraft were in constant communication and decided that the weather was still visual meteorological conditions (VMC) and the flight could continue on the planned route. The lead aircraft determined that the flight was too far north to return back to the departure airfield, so the flight was going to continue towards the refuel airfield. As previously stated, pre-mission planning was conducted thoroughly, to include inadvertent instrument meteorological conditions (IIMC) airfields along the route, in case the flight ran into un-forecast weather.

The weather continued to deteriorate while en-route to the refuel airfield and the ceilings kept pushing the flight lower to the ground in order to stay VMC. However, the flight was able to maintain clear of clouds and the weather forecast at the landing airfield was 1,200 feet ceilings and 4 miles visibility, so the flight decided to continue and push to the west to get into more favorable conditions.

The flight landed at the refuel airfield safely and luckily no one in the flight went IIMC, however, it was a situation that could have become extremely dangerous very quickly. The factors that saved the aircrew are as follows: thorough pre-mission planning, crew coordination between individual cockpits and the entire flight, the weather not getting worse, and utilizing aircraft systems to the fullest extent.

Pre-Mission Planning

Thorough pre-mission planning was utilized by planning a route that avoided towers by at least 2 nautical miles. If this flight route had towers on the course line, it would have been difficult to see them at times and would have added an increased risk for this mission. Also, the fuel planning allowed for a buffer great enough for the entire flight to deviate off route and still land at the pre-planned fuel stop. Thirdly, a thorough IIMC was planned and briefed, including multiple airfields along the route that the flight could deviate from. Not only did the IIMC plan mitigate the risk of the low visibility, but it also made the flight crews more comfortable because they understood the worst thing that would happen was them going IMC. Even if they had to commit to IMC, they had a plan in place that would save their lives.

Crew Coordination

Crew coordination was the second factor that made the flight successful. Constant discussion between the lead aircraft, the air mission commander (AMC), and the PCs of the other aircraft was crucial to ensuring each aircraft was in agreement. If one aircraft was not comfortable, the entire flight would have turned around or deviated to an alternate airfield and landed. However, due to the constant communication, that was not necessary. Additionally, the crew coordination within each cockpit between the pilots and crew chiefs was essential. Every individual in every crew was constantly scanning outside and discussing what they were seeing.

Aircraft System Utilization

Utilizing aircraft systems and reaching back to weather at the home airfield for updates also aided the crews in completing this mission. Each aircrew loaded the IIMC plan into their alternate flight plans and was prepared to execute the plan if necessary. The approach plates for the IIMC airfields were also made readily available by the aircrews for quick reference.

Conclusion

In conclusion, this specific flight was just one example of many that have run into inclement weather and were forced to make a critical decision in order to complete the mission safely. There are many factors of this specific mission that could have made this mission catastrophic. Luckily, the weather never got to the point in which the crew was forced to fly at a dangerously low altitude. Trusting the weather forecast is important but always be prepared for a situation like the one mentioned above. Also, it is imperative to plan alternate airfields and to take the proper time to make sure the IIMC plan is thorough. The biggest lesson learned is that no matter how much pre-mission planning is done, aviators cannot control the weather, so the best practice is to do everything in their power to reduce the risk of bad weather. ■

Name Withheld

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

Volume 33, Number 5 • May 2005

The Case for Precision in Training

For nearly 20 years, the High-Altitude Army Aviation Training Site (HAATS) has been an advocate of a unique training program known as power management. Essentially, this program uses power to quantify maneuvers, the environment, aircraft requirements and capabilities, as well as to evaluate pilot awareness and understanding. Our power management techniques provide the ability to conduct a comparative analysis of maneuvers, pilot opinions, and control inputs using the torque indicating system.

The student is able to observe the realities of his understanding and beliefs as well as aircraft capabilities in an objective and safe manner. Profound insights are gained in an objective, efficient, yet controlled method. Gone are the days when these insights had to be gained through surviving an unforeseen, hazardous event where chance is often the judge of the result. This program, HAATS Power Management Mountain Training, revolves around the idea of precision—precise perceptions, thought, speech, and actions—and promotes its usage throughout aviation but particularly during training.

In the final analysis, power and controllability are all that really matter to a helicopter pilot. When they are available in excessive amounts, as they are in most habit-forming training flights at sea level with light aircraft weights, the need for high levels of pilot awareness, insights, and finesse are nearly irrelevant. An empty helicopter is akin to the old joke inquiring as to where an 800-pound gorilla can sit … a pilot can do almost anything in a light aircraft without consequence. This reality has insidious consequences upon deployment. It is insidious in that the habit-forming, day-to-day routine of training at low weights and altitudes forms and reinforces the psychology, awareness, and finesse of our 800-pound gorilla. The substantial consequences of this type of training are written in the history of our deployments. As a matter of course, our deployments have demanded high-gross weight operations in extreme environmental conditions as the norm rather than the exception. The number of aircraft lost or damaged in a given theatre of operations, particularly in the first months, is evidence of the lack of the pertinent pilot awareness levels and skills when confronting requirements that are known to exist in typical deployments.

> **"The substantial consequences to ignore the lessons of our experiences is, as we know, to continue to invite repeated failures."**

The obvious solution to this issue is to determine the composition of a quality training program that addresses deployment needs, compare the findings to current training, amend as necessary, and execute it. A good place to start is in looking at the issue of habit formation.

The imperatives of combat, enemy threat, high multi-tasking, and high, hot, and heavy aircraft operations create a stress level that has a significant impact on our perceptive field. As time available to assess and execute diminishes, our perceptive field narrows, cognitive functions diminish, and responses become more reflexive, with the resultant behavior, decisions, actions, and consequences reflecting the quality of our training experience. This is one of the great truths in all human educational experiences. To ignore the lessons of our experiences is, as we know, to continue to invite repeated failures. If high-weight demands and extreme environmental conditions are a fundamental reality upon deployment, it is imperative that we identify what awareness levels and execution skills are necessary for operating an aircraft routinely with little or no margin of error and make them part of our every day, habit-forming existence. How can our training regimens reflect the known need? First and foremost is to demand precise, quantifiable standards in the execution of flight maneuvers. This can be accomplished, as you might have guessed, through the use of power as the standard.

The following diagram (Figure 1 below) conceptualizes a precision approach. The relationship of airspeed to power is seen to require a continuous proration throughout the approach—as airspeed decreases, power increases proportionately or the angle will change. It is understood that the aircraft will be in the same continuous rate of deceleration from the moment the angle is intercepted regardless of the speed at which interception occurs. The references to loss of main and tail rotor effective translational lift, transverse flow shudder and distance remaining. Subsequent approaches will determine what the correct combination should be. The most important external visual reference to be refined in this approach (or any other) is the distance remaining to termination. This is particularly critical as so many of our operational environments have missing or offer distorted vertical and lateral cues. The aircrew training manual (ATM) tells us when to go around but does not tell us upon what the decision should be based. The above process provides the answer to that question—in the distance remaining I can or cannot arrest the vertical or horizontal speed applied with the power available. The correct combinations of airspeed and power as well as the location of each aerodynamic event are to be retained in the pilot's memory for future reference. Understanding the components of a precision approach, coupled with knowing the power required, allows the pilot to conduct an efficient and effective analysis of his understanding and execution of the maneuver upon termination.

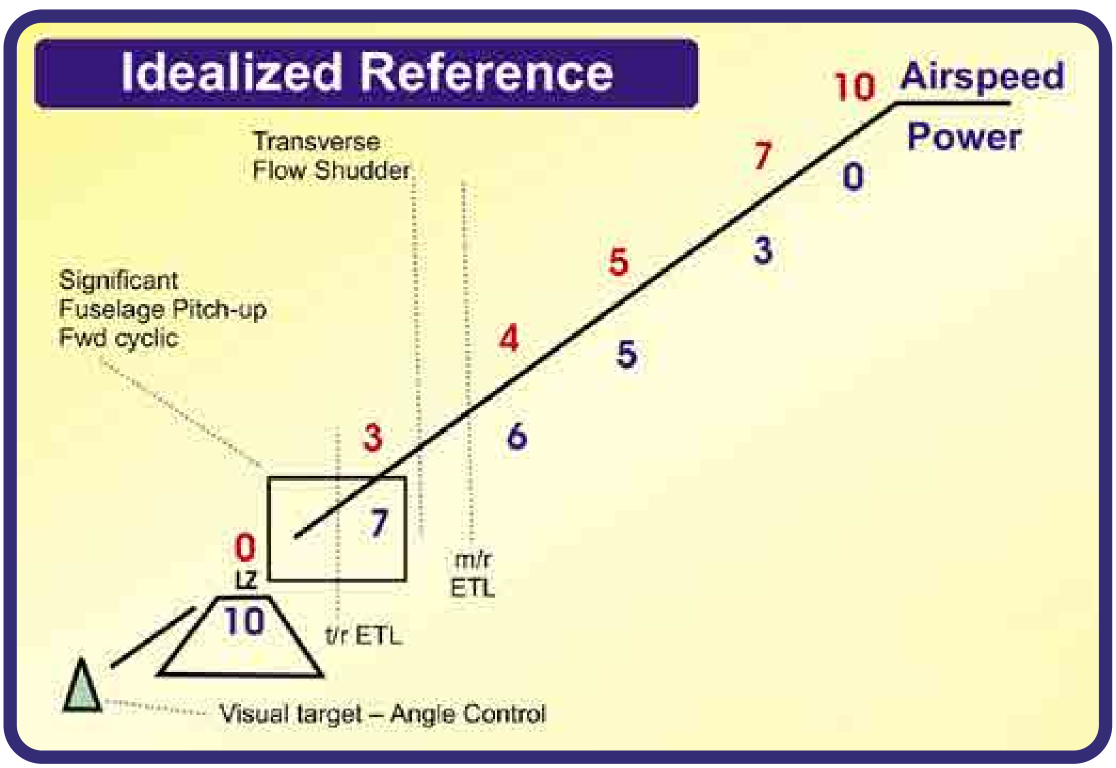

Figure 1

A pilot should not only know how much power is available for a maneuver but also how much is required when it is required, and how much time must be available for a limited amount of power to accomplish a given end. A pilot should be able to accurately predict the necessary power, control, and timing required to land, takeoff, accelerate, decelerate, climb, descend, and turn. This isn't an exercise conducted prior to takeoff such as a performance planning card (PPC), but rather a determination and prediction preceding every maneuver. When every maneuver is followed by either a formal or informal analysis of the results vis-a-vis power, the above questions can be answered. Comparing both power predicted and power expended to what is actually required provides the necessary insights into environmental and execution issues. Execution errors fall in the following categories: horizontal speed too fast or slow, vertical speed too fast, power applied too late, or the aerodynamic issues in Figure 1 on page 20 were not anticipated requiring reactive over controlling. Focusing on power in every maneuver breeds the necessary habits and awareness required for the current deployments and those to come.

"A good place to start is in looking at the issue of habit formation."

Let's analyze an ordinary task, TASK 1058 Perform Visual Meteorological Conditions (VMC) Approach, taken from UH-60 ATM, dated 17 April 2020, as an example of how one could dramatically improve the relevant learning experience using more precise standards simply by adding a few words. The second standard requires the crew to "ensure that sufficient power is available for the type of approach/landing desired." This standard could be significantly improved by also demanding that the crew correctly predict the required power as well. As noted, in order to accurately predict the required power, one must possess substantial awareness of those things that affect power (DA, weight, wind, surface issues, aerodynamics, control inputs, control timing—variables going well beyond a PPC), as well as the degree to which they affect power. Power management techniques accomplish these goals quickly.

The seventh standard, "Perform a smooth and controlled termination to a hover or touchdown to the surface," evaluates the termination phase of the approach but is actually counterproductive. This standard truly belongs in the category of "unintended consequences." It has been our observation that the vast majority of pilots achieve this standard by slowing horizontal speed early and using power indiscriminately. When power and control are limited, horizontal speed control is critical. Possessing the above habit is deadly. When the desired angle is maintained, the correct amount of power is used (typically that power required to hover at the desired height or smoothly contact the surface without rolling), and the correct power is used at the correct time (action, sequence, and timing), "a smooth controlled termination" is a by-product of the more precise standards.

Having a single standard for termination rather than four (correct power, correct timing, constant angle, full-stop) is the equivalent of conducting global positioning system (GPS) navigation while only receiving one satellite. Slowing down early and/or using power indiscriminately to achieve the current standard has established incorrect ground speed cues for the actual required speed demanded by precision execution. When precision execution is demanded due to limited power and control, limited space, adverse environmental conditions, or abrupt changes in conditions, all previous landings at lower standards have left most pilots ill prepared. It is easy to see, when power is critical, how a pilot might slow to his usual speed, fall through, droop the rotor, and crash short of his destination. Accident synopses are rife with this scenario and its variants. They needn't be. It is our obligation to provide aircrews training equal to the demands we know they will face. Quantifiable, precise standards are an essential starting point. ■

CW5 Moore
Standardization Pilot
HAATS.

Mishap Briefs #99

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

ROTARY WING

Utility

H-60

L Model: Aircraft was on a night vision goggle training mission and crashed in a remote mountain location at approximately 6,000 feet. Three fatalities. (Class A)

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Flightfax

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HIGH, HOT, AND HEAVY: SOME FACTS

Aircraft, rated and non-rated crewmember performance are always challenged by operating in high, hot, and heavy environments. These typically are associated with summer months in most geographic locations in the Continental United States (CONUS) while outside CONUS or OCONUS, Army aviation operations can find these challenging conditions throughout the year. The Army aviation branch has spent numerous man-hours and ink to develop and produce products which were designed to give aviation personnel the tools necessary to train for these operations and to reduce the risk inherent in high, hot, and heavy environments.

Let's take a look at some of these tools and risk reduction measures. Remember to include your non-rated crewmembers in the training program, their readiness to operate in high, hot, and heavy environments is just as important as the aviators in reducing risk to mission and force.

Hot Weather Operations

Training Circular (TC) 3-04.4, Fundamentals of Flight, Chapter 3, Section II covers operations in hot weather environments in detail. The TC's statement, "A region of environmental extremes, it has violent and unpredictable changes in weather and contains terrain not conforming to any particular model." is very accurate in reflecting the hazards to Army aviation when operating in hot weather environments. From reading the Blast from the Past HAATS article, you may have a better understanding of the power margins when operating in high, hot, and heavy conditions and how to utilize planning and training to develop effective risk mitigation measures. A thorough review of TC 3-04.4 will refresh you and your team's environmental training program so you stay sharp when conducting operations training and operations in hot weather conditions whether CONUS or OCONUS.

While classes and refresher training on the latest materials relevant to operations in high, hot, and heavy environments are the starting point, the unit standardization section should have a valid training program to put the classroom training to hands-on training in the simulator and aircraft. Developing rigorous situational training exercises in the simulator which put the aviators in heavy aircraft then subjected to high, hot, and heavy missions which require them to utilize their knowledge of the environment and effective decision-making to execute the missions will provide the unit aviators an opportunity to build their high, hot, and heavy skill sets. Next, the aviators can then transition these skill sets to hands-on in the aircraft. Every effort should be exhausted to transition the skill sets honed in the simulator to the aircraft. Maximize efforts to "load" the aircraft with weight so when conducting training the aviators must effectively use their learned power management skills and performance planning calculations. All aviators should have a far better understanding, following training, of the criticality of maintaining rotor RPM, managing power and that they go hand-in-hand. Don't forget about using the Directorate of Training and Doctrine (DOTD) Flight Training Branch information for aviation personnel located online at Army Knowledge Online (AKO) at:

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.html

5 Questions

1. Where can I find information on hot weather environments?
2. There is no reason to do simulator training when I can just fly the aircraft and train for heavy operations. True/False?
3. The DOTD Flight Training Branch can be accessed on Army Knowledge Online (AKO.) True/False?
4. Commanders don't have any responsibility to ensure high, hot, and heavy training is conducted. True/False?
5. Non-rated crewmembers don't need incorporation to high, hot, and heavy training. True/False?


4th-Quarter
AVIATION
SPIKE
STAY ON TARGET
Manage the Transition
High, Hot, and Heavy - Train for It
Crew Selection
Environmental Training Program
Personnel Turbulence
CHECK OUT THE USACRC ON SOCIAL MEDIA
https://safety.army.mil
U.S. ARMY
U.S. ARMY COMBAT READINESS CENTER