



## Emergency Response Methodology Update – Flight Reference Cards

Last spring, the U.S. Army Aviation Center of Excellence (USAACE) introduced a new approach for helicopter flight crews facing emergency situations: the Emergency Response Method, found in Shared Rotary Wing Aircrew Training Manual Task 1070. As part of Task 1070, the Emergency Response Method (FADEC-F) was the first phase of the overall USAACE effort to fundamentally change the way Army aircrews respond to emergencies. Since the introduction of FADEC-F, several aviation units reported real-world successes responding to in-flight emergencies and credited the Emergency Response Method with helping guide crewmembers through these challenging situations.

While Task 1070 provided a logical structure for crewmembers to respond to emergencies, the second phase of the Emergency Response Method focused on providing crews with a more functional emergency procedure checklist to enable efficient, crew-coordinated decision-making in flight. These updated emergency checklists, in a flight reference card (FRC) format, are being distributed to AH-64 D/E, CH-47 F, and UH-60 A/L/M units throughout all three components via the Army publication and distribution system (Figure 1). The FRCs complement Emergency Response Method Phase 1 and allow crewmembers to respond to emergencies in context with the situation, delaying noncritical actions while prioritizing aircraft control, crew coordination, and deliberate action.

### FRC OVERVIEW AND DEVELOPMENT

Between December 2019 and July 2020, a team comprised of personnel from the USAACE Directorate of Evaluation and Standardization (DES) and the Army's Aviation and Missile Command (AMCOM), as well as several other partner agencies,

TM 1-1920-271-CL

CH-47F EMERGENCY PROCEDURES  
MFD WARNING MESSAGES

Indication	Emergency	Card
ENG1 FAIL and ENG2 FAIL	DUAL ENGINE FAILURE	W-7R
ENG1 FAIL or ENG2 FAIL	SINGLE ENGINE FAILURE	W-7
ENG1 XMSN or ENG2 XMSN	ENG1 or ENG2 XMSN WARNING	W-10

FIRE AND EMERGENCIES WITHOUT WICIA INDICATIONS

	Emergency	Card
MISC./ PROCEDURES	AUTOROTATE	W-4
	EMER DESCENT	W-6
	EMER ENG SHUTDOWN	W-3R
	DITCHING	W-6R
	LANDING IN TREES	W-6R
ENGINE	SMOKE and FUME ELIMINATION	W-5R
	ABORT START	W-3R
	ENGINE COMPRESSOR STALL	W-8R
	ENGINE FLUCTUATIONS WITH NO CAUTIONS	W-8
	ENGINE RESTART DURING FLIGHT	W-8
ELECTRICAL	TORQUE MEASURING SYSTEM MALFUNCTION	W-8R
	DUAL GENERATOR FAILURE	W-10R
FIRE IN FLIGHT	ENGINE OR FUSELAGE FIRE — FLIGHT	W-4R
	ELECTRICAL FIRE — FLIGHT	W-5
FIRE ON GROUND	APU FIRE	W-4
	ENG COMPARTMENT, FUSELAGE OR ELECTRICAL FIRE — GROUND	W-4R
	RESIDUAL FIRE DURING SHUT- DOWN	W-4
FUEL	FUEL VENTING	W-11

Change 1 W-1

Figure 1. Flight reference card (FRC).

researched, developed, and tested a new checklist format, which ultimately became the FRCs being distributed to units throughout the Army. The FRCs, which are modeled off of products and best practices used by joint services, partner nations, and civilian aviation industry products, provide a more intuitive layout with in-cockpit functionality being the most important consideration. They feature color-coded emergency sections that



checklist once they achieve a safe flight profile. With the release of the FRCs, crews now have a checklist that allows them to quickly and efficiently do just that.

**REDUCED UNDERLINED STEPS**

During FRC development, a validation/verification team consisting of members from across DES, the Directorate of Training and Doctrine (DOTD), AMCOM, Systems Readiness Division, and Army experimental test pilots revised many emergency procedures for each aircraft. Through this process, the validation/verification team was able to reduce the total number of emergency procedures with underlined steps across all three combat rotary-wing platforms by approximately 60%. This was a crucial aspect of the overall FRC development process and Emergency Response Method because these updated emergency procedures enable crews to truly focus on identifying the most important emergency procedures to regain or maintain safe flight conditions. This shift in focus aligns with the operations of several joint and partner nation aviation forces and meets the needs of a modernized aviation force.

The remaining underlined steps in each set of FRCs must still be memorized and executed from memory to ensure aircraft control and crew safety.

However, in all other instances, the FRC format and structure now enables crews to physically open their checklist document in flight before executing any non-underlined emergency steps. By removing many underlined emergency procedure steps, the FRCs provide a method to free crews from memorizing dozens of procedures and enables them to refer to in-cockpit documentation instead, reducing the possibility of cognitive errors.

**FRC ROLL-OUT TRAINING**

**To accompany the release of the FRCs, DES developed a standardized communication (STACOM) message to standardize implementation across the force. The STACOM is posted to the DES Army Knowledge Online portal, along with links to other resources for FRC training. Of note, units must implement FRCs between Nov. 1, 2020, and May 1, 2021.**

The downloadable FRC training package is available on the USAACE DOTD Flight Training Branch website, which will enable units around the world to train crewmembers on their proper use. This package provides a narrated FRC overview presentation intended for delivery to groups of students, as well as several example videos showing the FRCs in use across a variety of simulated aircraft emergencies from benign to severe (Figure 3).



Figure 3. FRC training video.

TM 1-1520-280-CL

**HYD PUMP 1 FAIL WITHOUT BACK-UP PUMP ON ADVISORY**

Indications

- **HYD PUMP 1 FAIL** - **T/R SERVO 1 FAIL** - **PRI SERVO 1 FAIL**

Immediate Actions

- **BACK-UP HYD PUMP switch — ON**

Urgency to Land

- LAND AS SOON AS PRACTICABLE - If BACK-UP PUMPHYD PUMP advisory light appears
- LAND AS SOON AS POSSIBLE - If BACK-UP PUMP HYDPUMP advisory light does not appear

Subsequent Actions

*If BACK-UP HYD PUMP advisory does appear:*

- TAIL SERVO switch — BACK-UP then NORMAL

Considerations

- Loss of both the No. 1 hydraulic pump and back-up pump results in both stages of the tail rotor servo being unpressurized. The yaw boost servo is still pressurized and the mechanical control system is still intact allowing limited tail rotor control. Because of the limited yaw control range available, a roll-on landing 40 KIAS or above is required. Do not use aerodynamic braking
- Bank angles shall be limited to 30° when a PRI SERVO FAIL caution appears

*Hydraulic system inoperative limits:*

- Two hydraulic system inoperative — 150 KIAS
- Two hydraulic system inoperative IMC — 140 KIAS

Additionally, the training package features a practical exercise (Figure 4) with simulated emergency scenarios specific to each airframe, which will guide crewmembers to the unique layout and functionality of their respective FRCs. The final phase of FRC implementation training will be a simulator or flight training period to cement the logic and use of the cards. This training period will highlight various emergency procedures to expose crews to additional features or unique aspects of each FRC document and highlight changes made to various emergency procedures.

**TRAINING IMPLICATIONS AND CONCLUSION**

With Task 1070 and the FRCs, emergency procedure training and evaluations throughout the Army will shift from determining how quickly crewmembers can recite memorized emergency procedure steps to how well crewmembers maintain safe flight, analyze the situation, and respond appropriately to the emergency. This transformation in emergency procedure training throughout Army aviation will enable crewmembers to respond to emergencies contextually within the situation and utilize their FRCs to determine the best way forward. This is especially critical as units continue building proficiency to operate in the complex and dynamic conditions associated with combat against peer- or near-peer competitors in large-scale combat operations (LSCO).

As the Army continues training to meet the challenges of LSCO, Army aviators must change the way they think, train, and fight for the threats of today and into the future. The Emergency Response Method and the FRCs are part of the evolution that will enable crews to focus on employing the aircraft for that fight. The fundamental changes established in Task 1070 and the FRCs will train our



Figure 4. FRC practical exercises.

crewmembers to analyze and overcome emergencies rather than simply reacting to situations through rote execution of memorized procedures. Through the Emergency Response Method, Army aircrews will now be better prepared to respond to emergencies so they can continue to fight and win on the battlefields of today and tomorrow. ■

**Above the Best!**  
**David J. Francis**  
 Major General, USA  
 Commanding



## Aviation Maintenance in Cold Weather Environments

**I**n the spring of 1996, while ferrying an aircraft to our intermediate maintenance support at Kaposlak, Hungary, I was shocked to see a prepared surface (short concrete runway) on the airfield. I had spent three months at the airfield in the winter months and honestly had no idea there was a runway underneath all that snow. While at Kaposlak, every maintenance action performed was more difficult than normal and keeping our maintainers warm enough to perform aircraft maintenance and free of cold weather injuries was a daily challenge. With no hangars, Apache crew stations with the auxiliary power unit running, and High Mobility Multipurpose Wheeled Vehicles (HMMWV) were our warming stations. Lost tools and protracted

task times were things you had to live with. As the snow would begin to melt another set of challenges would arise if a crane was required for a maintenance procedure. Our traditional maintenance crane spent more time stuck than it did moving. Innovative workarounds like using a Heavy Expanded Mobility Tactical Truck (HEMTT) crane kept maintenance moving for the most part but lacked the lifting height of the maintenance crane. During an Apache main transmission removal and installation with the HEMTT crane, my platoon sergeant and I were forced to remove the main rotor driveshaft by hand (trust me, you don't want to try this). During this time I had zero knowledge of the doctrinal publications, or their predecessors, we were about to dive into.



**Train for the expected operational environment**

Army Techniques Publication (ATP) 3-90.97, Mountain Warfare and Cold Weather Operations, offers several training considerations for aviation maintenance and logistic personnel. Hands-on and real-time environmental and survival training for Soldiers followed by actual aircraft support in the anticipated environment. Training in the anticipated environment helps Soldiers understand all the factors affecting aircraft, tools, equipment, vehicles, support equipment, and themselves while providing maintenance support.

**Cold weather considerations for aviation maintenance**

Army Techniques Publication 3-04.7, Army Aviation Maintenance, provides the following cold weather considerations:

- All tasks require more time and effort due to cold-weather effects on equipment and personnel requirements to wear cold-weather clothing and gloves. At temperatures below -20 degrees Fahrenheit, maintenance tasks may take five times as long to complete.
- Maintenance units usually require additional personnel to offset the increased time necessary to complete maintenance tasks.
- Extreme cold-weather conditions may limit the use of aircraft.
- Maintainers must allow equipment to thaw out and warm up before making repairs.

- A portable combustion type of heater, incorporating a blower and flexible hoses for application of heat to localized areas, may be used for preheating aircraft components and systems before starting.
- Heaters may be used to heat specific portions of the aircraft so maintenance personnel can work without gloves.
- When temperatures remain below freezing, aircraft batteries not in use should be removed and stored in a warm place.
- Required installation of cold weather auxiliary equipment; such as winter cowls, oil dilution systems, personnel heaters, and covers add time to normal maintenance operations.

**Cold weather risks on or around aircraft and at Forward Arming and Refueling Points (FARPS)**

**From doctrine:**

- Potential aircraft damage and personal injury can occur when clearing snow and ice from main rotor blades. An auxiliary ground power unit may be used to melt snow from the aircraft using bleed air.
- Caution should be taken while moving aviation ground support equipment.
- Whiteout conditions can cause a loss of situational awareness and impair the crew's view of ground obstacles and personnel.
- Static electricity in cold, dry conditions, increases the risk of accidents involving fuel and ammunition.

**From experience:**

- Leaders must be familiar with the contents of Technical Bulletin (TB) MED 508, Prevention and Management of Cold-Weather Injuries.
- Personnel that have experienced previous cold-weather injuries must be identified prior to operations in cold weather.
- Risk from falls increases significantly when ice is present on aircraft walking/working surfaces.
- Carbon monoxide in enclosed shelters from heaters, cranes, and vehicles is a safety hazard.

**Maintenance facilities recommendations from ATP 3-04.7, Army Aviation Maintenance**

These recommendations should be considered when a unit operates in cold weather geographic areas or is slated to operate in geographic areas involving cold weather:

- The availability of proper maintenance facilities can be critical to the maintenance mission. Without some type of permanent or temporary shelter, even routine maintenance can become extremely difficult, if not impossible to perform.
- Heated buildings or shelters are a necessity for conducting aircraft maintenance in a cold-weather environment. Proper and satisfactory aircraft preventative maintenance checks and service requires personnel to work in moderate temperatures within an enclosed structure. Maintenance of many components requires careful and precise servicing and inspections, which is not possible while wearing cold-weather clothing.
- When buildings are not available, lightweight maintenance enclosures (LME) are a temporary and expedient method to use for maintenance. If possible, LMEs should have wood flooring and be heated. Maintenance leaders and supervisors should closely monitor personnel working in these conditions, responding immediately to the first indication(s) of any cold-related symptoms or injuries.
- During certain times of the year, hours of daylight in a northern environment are short. Lighting equipment must be available and in sufficient quantity to furnish adequate illumination for maintenance services. Lights with ample cable extensions, attachment plugs, connectors, and spare bulbs are a necessity.

**Summary**

Ensure maintenance personnel and leaders (aviation maintenance officer (AMO), battalion AMO, brigade AMO, production control officer/



NCO, quality control officer/NCO) have the proper environmental training and are involved in planning cells prior to real-world deployment or combat training center rotations. Otherwise, you will not arrive with everything you need to hit the ground maintaining!

In the end, we survived the Hungarian and Bosnian winter and redeployed all personnel, 24 Apaches, and our rolling stock without a single incident. We never found those tools. Sixteen months later we arrived back to Kaposulak and were surprised to find multiple Clamshell hangars, a dining facility, and a host of other life support activities. ■

**References:**

*ATP 3-04.7, Army Aviation Maintenance (September 2017)*  
*ATP 3-90.97, Mountain Warfare and Cold Weather Operations (April 2016)*  
*TB MED 508, Prevention and Management of Cold-Weather Injuries (April 2005)*

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# Dust and Snow Techniques

**W**hen considering snow and dust landings, the first thing I would recommend is checking the appropriate aircrew training manual (ATM) tasks for snow and dust considerations. There are time tested techniques referenced, but as with any publication, it cannot cover all the variables in detail. I will briefly try to share with you a few techniques that have helped me survive through 40 years of flying in dust and snow, in several different airframes. The techniques for a successful take-off or landing in a brownout or whiteout condition are essentially the same. With that said, I think all would agree the most challenging maneuver is the landing when visual reference to the surface is lost.



Let's face it, losing sight with the ground while landing is downright scary. However, like any other challenge, the more successful repetitions of snow/dust landings an aviator completes the less scary they become. So on that note, PRACTICE. Now is probably a good time to mention something I have noticed over the years. Very few degraded visual environment (DVE) crashes occur during landing. Yes, you read that correctly and after thinking about it, you find they occur during the attempted go-around after folks start scaring themselves during the landing attempt. So my first piece of advice would be once you have completed a good, or the best possible recon of the landing zone (LZ) based on the tactical situation, commit to the approach to the ground. Emphasis here is on "TO THE GROUND!"

## The Root Problem

I believe this is the root problem of failed DVE landings, a failure to commit to the approach to the ground. This problem starts at the United States Army Aviation Center of Excellence (USAACE) school house. From primary through advanced aircraft qualification I continue to see student pilots terminate approaches at a hover. Apparently, someone is teaching them this and I wish they would stop. Look, I get it that terminating an approach to a hover is easier, but in this case "easy" doesn't push you to improve your skills. My recommendation is unless you have a compelling reason not to, make every approach to the ground and to a point on the ground at your LZ. Practice your DVE approach and touchdown technique even when you can see. It's

called positive habit transfer. As mentioned in the ATM for dust and snow considerations, pilots must stop focusing on how smooth you can touch down and just safely get the aircraft on the earth.

### The Problem

The problem I observed when conducting DVE landings with inexperienced aviators is they tend to get too slow, too soon. That is in terms of ground speed and rate of descent. All too often by about 30 feet above ground level (AGL) we are essentially hovering and being engulfed by a cloud of snow/dust. At this altitude, we should be at the bottom end of effective translational lift or ETL and have a 300-500 foot per minute rate of descent. Also at this point, we should be checking the power. If the power is at or above that required for a 5-foot hover, guess what, you're not going to make it to the ground.

You should be keeping the wings level and flying the aircraft to the ground. Also, don't be afraid to use the brakes if you anticipate touching down with forward speed and aren't comfortable with a little ground roll. If the tactical situation permits another tip would be to make a mock approach with a planned go-around. Much like what we teach in the High Altitude Mountain Environmental Training (HAMET) course, fly a mock approach as low and slow as safely possible to your intended touch down point. Among other things, this will give you a better sense of how thick the snow/dust cloud might be

and how the surface winds will affect the cloud.

On that point, I will also mention that while I am training DVE landings I always start with a couple of iterations of go-arounds. For go-around training, fly the approach low and slow until fully engulfed in the cloud (recommend no lower than approximately 5 feet AGL) and then execute a go-around. Remember what I said earlier, go-arounds are when the accidents happen so they are worth practicing in a controlled and anticipated situation. Some additional considerations when conducting a snow landing versus a dust landing are that snow tends to hide things like rocks, tree stumps, logs, and ditches.

One last technique that we teach in HAMET but I haven't seen listed in ATMs is when selecting a touchdown point, select an object that won't get blown away by rotor wash and use it as a visual reference point to land to. If possible, select a rock or bush that will fit under the rotor disk and land as close as safely possible to that point. By keeping the object under the rotor disk it is less likely to disappear in the ensuing cloud. I might add that if using a small tree be absolutely sure it will fit under the rotor disk when you go flat pitch. I do remember this scenario not working out well for an aircraft I was escorting.

Now to the easy part. The takeoff. The first thing I would recommend is to look in front of you. See what's out there. Remember that. Take a mental picture and plan your route out and contingency





plans. Now, in accordance with the ATM, apply power. If you are in the snow it is advisable to apply power slowly at first to ensure a wheel or skid is not frozen to the ground or stuck on an unseen object. As discussed on the snow landing, even a frozen layer that you have broken through may be enough to cause an unanticipated change in roll attitude. Once you are sure you are free of the ground, continue to apply out of ground effect (OGE) or max torque available power. If you have no obstacles in front of you, a rapid transition to an airspeed over altitude take-off is recommended once you are clear of the ground. Make sure you are executing effective crew coordination and verifying the vertical speed indicator (VSI) is pointing in the right direction which is showing a positive climb. Once again, as with the landings, meaningful repetition is the key to success.

### **Closing**

In closing, I will again recommend that you review snow/sand/dust considerations in your ATM. Deep snow tends to thaw and refreeze causing multiple hard layers that have to be broken through and often the wheels or skids choose not to do this in unison which can turn into a significant emotional event for the flight crew. Therefore when landing on snow it is important that a very, very thorough touchdown point recon is recommended. It has been my experience that the hover and blow the snow away technique is very useful, but keep in mind with a frozen layer a hidden object may still exist.

Some techniques may vary by mission, design and series, but what I have talked about here has worked well for me in UH-1H to AH-64E over the past 40 years. Also, practice! Our Army aviators won't get

better at snow/dust landings if they don't practice. Meaningful practice will require actual whiteout and/or brownout conditions. Anything less and aircrews will continue to be deficient during DVE operations. I have been "demonstrated" brownout/whiteout training at a few places by well-meaning instructor pilots (IP), but we never even got close to losing visual reference to the horizon let alone the surface under the rotor disk.

Commanders play a critical role in readiness. This includes dedicating the time and resources for aircrews to gain and maintain proficiency. This begins with IPs and standardization instructor pilots (SP) sharpening their skills, prior to teaching other pilots to do the same. With dust and snow landings as with many other tasks, commanders need to give their IPs and SPs time to practice and sharpen their skills, and become confident in their abilities while flying with each other. Too often commanders expect our trainers to maintain a higher skill level without giving them the opportunity to actually practice flying. The result is highly skilled trainers of tactical methodology and weaponeering, with an average to below-average ability to fly the aircraft. At the end of the day, we also need to "fly" these technological marvels around on the battlefield as well as teach others to, but I will save that discussion for another article. Fly safe. ■

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# Command Safety Council, What is Your Excuse?

**W**hen was the last time you attended a safety council or read the minutes? Is your unit fulfilling this Army requirement? Let's take a look at what a safety council is and the purpose behind the requirement. Units that do not conduct safety councils increase risk when not hosting a forum to discuss those safety items that pose risk in their formation.

## **Forces Command (FORSCOM) Aviation Resource Management Survey (ARMS) Trends:**

The first critical step is to schedule the safety council to ensure it is on the unit's calendar. The commander always has visibility of the calendar, so this is a great leveraging tool assuring the safety council will be conducted quarterly. Using the 1st Semiannual FY20 FORSCOM ARMS trends, 50 percent of the active-duty units audited failed to meet quarterly. Fifty-six percent of the units failed to review unit open deficiencies on the unit's hazard log (HAZLOG). Finally, 31 percent failed to assign action officers and suspense dates to assigned actions. For more FORSCOM ARMS trends visit the FORSCOM section on [www.jtdi.mil](http://www.jtdi.mil).

## **Guidelines:**

In accordance with (IAW) Army Regulation (AR) 385-10, The Army Safety Program, a Command Safety Council and Enlisted Safety Council will each be designated in writing at battalion level and above. This is normally codified in the safety standard operating procedure (SOP) and explains the council requirements. Councils will, at a minimum, meet quarterly to review risk control options, make risk control option decisions, and

direct implementation of risk control options.

The Command Safety Council and Enlisted Safety Council may be combined at no higher than battalion/squadron level as one council in units with a low density of officers or enlisted personnel, such as detachments and platoons. In aviation units, the standardization section is incorporated to form the Safety & Standardization Council to allow the commander to address issues facing the unit from both sections for added synergy and unity of effort. Councils should be the minimum size necessary to facilitate the safety management program. Large councils are difficult to manage and should be avoided.

On a case by case basis, the commander may direct additional personnel to attend council meetings to provide expertise on or insight into specific issues. The safety council members can be addressed in the unit's safety SOP on who is required to attend the meetings. Members are selected to advise the commander on the status of safety within the unit and to recommend control options for improving safety. As the facilitator of the council, the aviation safety officer (ASO) reviews results of accident-prevention surveys and other inspections, brings noted deficiencies to the immediate attention of the commander and Command Safety Council, and establishes follow-up procedures to correct deficiencies and assess the effectiveness of updated risk control options.

## **Small Units:**

In accordance with Department of the Army (DA) Pamphlet (PAM) 385-1, Small Unit Safety Officer/Noncommissioned Officer Guide, a unit





safety council provides a forum for a review of risk management (RM), all hazards, mishaps, inspection findings, and support facility hazards that impact unit operations. An effective council has members that represent a cross-section of the unit with all sections of the unit represented. Use this forum to invite outside agencies such as installation safety, preventive medicine, alcohol and drug abuse prevention and control, chaplain services, environmental compliance specialists, and so forth, to provide an assessment of the unit programs or to give insight into available services. AR 385–10 and DA Pam 385–90, Army Aviation Accident Prevention Program, contain safety council requirements for aviation units and provide useful guidelines for the additional duty safety officer (ADSO)/noncommissioned officer (NCO) to develop an effective ground unit safety council.

#### **Council Minutes:**

Council minutes should be provided to the commander for signature and disseminated to council members, any tasked action officers, and a copy should be placed on the safety board to allow Soldiers in the unit to see the most recent Command Safety Council minutes. Open discrepancies or new business not completed during the meeting needs to be added to the unit's HAZLOG. This allows the safety officer to track and monitor open faults and closeout faults once corrections are complete.

This assists the commander in holding individuals accountable, and depending on the severity of the risk, the commander can take action to mitigate the hazard. Council minutes must be maintained on file for a minimum of two years and are inspectable items.

#### **Summary:**

I encourage commanders and ASOs to make the Command Safety Council a priority for the safety of every Soldier and piece of equipment in their formation. The Council is the commander's forum to address safety issues facing their unit and is a critical prevention tool to prevent the next mishap. Not scheduling, conducting, or documenting an Army safety requirement is a failure, the commander nor the ASO should tolerate it. ■

#### **References:**

*AR 385-10 The Army Safety Program*

*DA PAM 385-1 Small Unit Safety Officer/  
Noncommissioned Officer Guide*

*DA PAM 385-90 Army Aviation Accident Prevention  
Program*

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# Aviation Ground Support Equipment: Round II

**W**e all know that our maintainers are the **lifblood of Army aviation. Without their skills, dedication, and endless turning of wrenches, operational readiness would be very low and aviators would have nothing to fly but a desk. No matter how much skill the maintainers have they would not be able to efficiently perform their maintenance tasks without the help of a wide variety of aviation ground support equipment (AGSE).**

The custodians of tool rooms and AGSE have a full-time job managing this time-consuming equipment, to say the least. Like the production control office manages aircraft maintenance, the AGSE program is managed to keep required AGSE on hand for all scheduled and unscheduled maintenance. If not properly managed or maintained, the unavailability of appropriate GSE may prevent maintenance task completion to standard. In accordance with (IAW) ATP3-04.7 par 3-18, the aviation maintenance officer (AMO) will monitor battalion aviation resource management of AGSE. Commanders should receive daily status reports for aviation and ground support equipment to maintain combat readiness. Quality control (QC) personnel are required to maintain safety messages separately for all aircraft and associated equipment, night vision devices (NVD), AGSE, and general messages. This ensures the commander's equipment is maintained IAW current standards and any safety messages that might affect the serviceability of the equipment or the equipment it works on.

## Standard Operating Procedures (SOPs)

A well-developed SOP for AGSE will need to address proper training, testing, and licensing for each piece of equipment. Ensure your organization is licensing all personnel who operate AGSE on an OF 346 or DA Form 5984-E. Not only do we send aircraft lubricants off for analysis, but our AGSE requires the same regimented inspections since the equipment services our aircraft. Aviation Ground Power Units (AGPUs) and other servicing equipment require scheduled maintenance that your unit GSE Managers/NCOs/Coordinators must document and track. All AGSE used to apply external hydraulic power to Army aircraft shall be inducted into the Army Oil Analysis Program (AOAP) and sampled every 50 hours/30 days, whichever occurs first.



## Who Should Care?

Every maintainer and first-line supervisors should set the example by making sure the units AGSE is serviceable and has current inspection tags attached to the equipment before use. Supervisors should conduct routine spot checks of the hangar and flight line areas to ensure all equipment is being maintained and if not, remove it from service until the equipment is inspected and inform your GSE managers/NCOs/coordinators of the discrepancy. Faulty AGSE could lead to your unit's next accident or incident, so be mindful of your work environment and use all available resources to mitigate risk and provide serviceable equipment to your Soldiers. ■

## AGSE "The Maintainer's Kit Bag for Maintenance"

**Every AGSE Manager should have:**

<https://www.jtdi.mil/group/agse/home>

*PS Magazine*

<https://www.psmagazine.army.mil/>

*AGSE PEO AVN*

<https://agse.peoavn.army.mil/AGSEHelpDesk/AGSE>

*AMCOM Safety and Maintenance Messages*

<https://asmprd.redstone.army.mil/>

## References:

*ATP 3-04.7 Army Aviation Maintenance*

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# UAS, A Healthy Dose Of Leadership!



“We must examine all aspects of our warfighting methods and understand how we enable the joint force on the future battlefield. We must challenge our underlying assumptions, and we must understand the capabilities and goals of our potential enemies. That is how we change our warfighting techniques and build the fighting forces we need in the future. It is also how we maximize deterrence and, if necessary, win future wars. TRADOC PAM 525-3-1”

**Mark A. Milley**  
**General, United States Army**  
**39th Chief of Staff**

**U**nmanned aircraft systems (UAS) are a vital component of Joint Forces on the current battlefield and a growing asset for future conflicts. Unmanned airframes will continue to be critical as evidenced by the testing and development of new systems for future fielding(s). UAS has proven to be a huge success in the counter insurgency fight with a solid track record for flying millions of hours with engagement numbers that challenge those of manned airframes. As we turn our focus to the future, large scale combat and multi-domain operations, it is imperative for leaders to recognize not only the challenges but the immense capabilities alike in UAS units across the Army.

The exponential growth and demand for UAS in the last 20 years has led to a multitude of challenges in training and standardization. Historically, UAS units have struggled to maintain quality aircrew training programs (ATP) but as regulations are blended and UAS is further incorporated into doctrine the future shows promise. Leaders need to be the bridge between regulation, standardization, and training in order for UAS units to attain and maintain the standard. When a commander is not fully engaged with their UAS platoons and/or companies the deficiency is identified when standardization programs suffer and UAS personnel are not trained to the level expected of their manned counterparts.

Commanders face many unique and difficult leadership challenges in UAS units. Many UAS platoons are geographically separated from their organic company due to facility requirements and often deploy at different times or locations from their rotary-wing peers. Leaders are required to familiarize themselves with an additional airframe in order to understand its capabilities and training requirements as well. Although commanders have been successful at overcoming these adversities to a degree, it is evident they are struggling to do so. A disparity in the execution of the ATP in accordance with (IAW) regulations and directives is typically an indication that a divide in standards or training quality exists between manned and unmanned programs. Below are listed indicators of a problem with UAS programs:

- DA Form 7120 series not IAW Training Circular (TC) 3-04.11, Commander's Aviation Training and Standardization Program
- DA Form 7122 series not IAW TC 3-04.11
- ATP integration issues
- Simulator training quality
- Manned/Unmanned teaming
- Standardization Operator (SO)/Instructor Operators (IO) training and mentorship
- Varied Standards

Every problem in ATP management sighted above can be corrected with a healthy dose of

proactive, hands-on leadership. Army Doctrine Publications (ADP) 6-22, Army Leadership and the Profession, defines leadership as, "The activity of influencing people by providing purpose, direction, and motivation to accomplish the mission and improve the organization." An important step for commanders to improve the organization is to foster a positive environment that views UAS as a valuable part of the team. It helps if the commander knows and understands the capabilities and limitations of his UAS platform to include the view from inside a ground control station (GCS). Commanders need to encourage subordinate leaders to integrate UAS whenever possible, from daily training and academics to culminating training events.

The young Soldiers and noncommissioned officers (NCO) in each UAS organization have many challenges ahead of them. They are frequently undermanned and short on equipment. Still, they are expected to train at a home station that often does not easily support the requirements for live flight in the Continental United States (CONUS). The newly promoted E-5 IO is expected to accomplish nearly the same duties and responsibilities as their CW2 counterpart but with a fraction of the experience. Unmanned aircraft system NCOs need the support, guidance and mentorship that a good leader can provide. Commanders can make the difference between an NCO that leaves the Army upon completion of their six-year contract and an NCO that stays in the Army to share what they have learned with the next generation of Soldiers.

Commanders are the obvious leader to institute change, however, standardization instructor pilots (SP) are critical as they assist in managing, developing and executing the commander's ATP according to his or her intent. Company SPs are the first line of integration with their UAS counterparts. The company ATP includes the UAS platoon. This means that success or failure of the UAS ATP is equally dependent on both manned and unmanned standardization as a single, integrated program. Standardization pilots mentor and train their junior instructor pilots, so too, should they expect to do so with young IOs and SOs. The SP to SO mentorship is sorely needed to make up for the low retention rates of a military occupational specialty where most of the experience exits the Army at the six-year mark.

Commanders are problem solvers and warrior



*The Army Leadership requirements model*

figures set before us to lead Soldiers into the fray. UAS are an asset and a combat multiplier but in order for them to be utilized to the fullest, commanders have to lead them. To field an effective UAS unit, commanders must fully integrate UAS with manned systems in every aspect of the ATP. Encourage your SPs to train and mentor UAS SOs. Ensure standardization oversight of training for UAS whether it be simulator or live flight. Whenever possible UAS should be training with their manned aviation brethren. UAS is a critical asset we will need to win future wars, this requires leaders to be there to instruct, integrate, and guide them. ■

**CW4 Bart Berns**  
**UAS Standardization Officer**  
**Directorate of Evaluations and Standardization**

“The truly great leader overcomes all difficulties, and campaigns and battles are nothing but a long series of difficulties to overcome. The lack of equipment, the lack of food, the lack of this or that are only excuses; the real leader displays his quality in his triumphs over adversity, however great it may be.”

**George C. Marshall**  
**General of the Army**  
**Graduation address to the first Officer Candidate School class (1941)**

# Mishap Review - CH-47D IIMC Brownout

**T**he mishap crew was Chalk 2 in a flight of three CH-47Ds conducting an air movement of 86 troops in support of Operation Iraqi Freedom. Chalk 2 was in free-cruise formation when the aircraft entered an area of rapidly decreasing visibility. As the flight slowed, Chalk 2 was forced to rapidly maneuver out of the formation. While the other two aircraft initiated inadvertent instrument meteorological conditions (IIMC) break-up procedures, chalk 2 descended and attempted to land. At 50 feet above ground level (AGL) and near zero airspeed, the pilot in command (PC), on the flight controls, lost visual reference with the ground and elected to continue the approach. The aircraft impacted the ground, rolled right, and came to rest on its right side. The aircraft received major damage and was destroyed in place by U.S. Air Force aircraft bombardment. The crew received only minor injuries.

## History

The mission was to conduct a night air movement of 86 personnel while conducting operations in Iraq utilizing three CH-47Ds. The concept of the operation was for the flight to depart a logistics support area (LSA), refuel en route to the PZ, and then proceed to the PZ for passenger pickup. The flight would then precede back to the original PZ, drop the passengers off, and proceed back to the LSA. The mission was received on 14 April and was originally scheduled for 15 April. However, the mission was canceled due to bad weather and rescheduled for 16 April. The task force (TF) S3 approved, authorized, and disseminated the mission.

On the mission day, 16 April, the mishap crew reported in at 1500, completed aircraft preflight and updated the aircrew mission brief and received an updated weather brief at 1715. The PC of the



mishap crew was the air mission commander for the mission. The weather update was disseminated by the company standardization pilot (SP) and he stated it was good. Due to illumination, the risk for the mission was "High." To mitigate and reduce the risk to medium, the brigade commander put the SP in the lead aircraft.

The flight of three CH-47Ds departed the LSA at 2055 en route to the PZ. The flight headed southeast in a free cruise formation at approximately 130 knots and an altitude of 300 feet AGL. Approximately 50 miles southeast of LSA, the flight encountered blowing sand and deteriorating weather conditions. The lead aircraft announced to the flight he was slowing to 90 knots. Chalk 3 acknowledged the speed change but Chalk 2 did not. As the flight began to slow, Chalk 2 began to overtake and over fly Chalk 1. Chalk 2 executed a right turn to avoid a midair collision and lost sight of Chalk 1 during the turn causing the PC to take the controls. As a result of the right-hand turn and an inadvertent climb, Chalk 2 was now at 600 feet AGL. At the same time, the flight engineer (FE) and crew chiefs (CE) lost contact with the ground and other aircraft in the flight. The PC stabilized the aircraft and descended to 200 feet AGL. As the visibility continued to decrease, the PC, who still had visibility with the ground, decided to land and wait until the weather passed.

At approximately 50 feet AGL, with near zero airspeed, the aircraft became enveloped in a dust cloud. Although the PC had no visual contact with the ground, he chose not to apply power to execute a go-around and continued for landing. The aft right landing gear struck the ground and was torn from its mounting points. The initial impact caused the aircraft to rebound upward and drift to the rear. The PC corrected the rearward drift, but a right lateral drift was induced. The CE and FE occupying the right and left cabin gunner positions announced the lateral drift but the pilots did not acknowledge or react to the announcement. The aircraft struck the ground a second time in the vicinity of the ramp. The impact ejected the ramp gunner from the aircraft who was then pulled behind the aircraft by his gunner's harness. All other occupants remained in the aircraft. The aircraft then began to roll to the right, coming to rest on its right side sustaining significant structural damage during the accident. The crew received only minor injuries.

### **Crew**

The PC had 565 hours in MTDS and 788 hours total time. The pilot (PI) had 206 hours in MTDS and 995 hours total time.

### **Commentary**

The PC's actions were a result of his overconfidence in his abilities to safely land the aircraft, a lack of confidence in his ability to fly under instrument meteorological conditions, and inadequate environmental training. The PC only received the minimum required training at the initial staging airfield and received no additional environmental orientation training upon arrival at the LSA. The PC had experienced difficulties in the past when attempting to complete his annual instrument flight evaluation. Additionally, the SP failed to update the weather prior to departure and failed to ensure the weather would be above standard minimums during the conduct of the mission.

While conducting multi-ship operations in new operational areas, it is paramount that commanders give their crews maximum training time to conduct environmental training. Most home station locations won't have all of the different environments available to maintain currency in the aircraft. Leaders should manage their training programs with integrated

situational training exercises (STX) in the aircraft simulator and when able have crews fly in actual conditions whether that be during a combat training center rotation or by deploying aircraft to an area which provides the environmental conditions not available at home station (dust, sand or snow). There is no substitute for in-aircraft, hands-on training execution.

Crews should be aware of the standards and these should be enforced by leaders at all levels. When units allow their standards to lapse due to apathy or a lack of leadership, the situations develop which produce poor outcomes such as was the case for this mission. Leaders need to get their programs up and running on environmental training and ensure their crews are engaged in active mission planning and using STXs to challenge the crews. Unit aviation safety officers and IPs should provide oversight of the commander's training program, set the standards for the unit and those pilots showing weakness in an area, the IPs should inform the commander and provide additional training so the unit crews are fully mission capable. ■

# Class A - C Mishap Tables

Manned Aircraft Class A – C Mishap Table											as of 1 Oct 20
Month	FY 19					FY 20					
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		
1 <sup>st</sup> Qtr	October	1	1	4	0		2	2	3	0	
	November	0	0	3	0		1	0	2	2	
	December	1	1	2	0		1	1	2	3	
2 <sup>nd</sup> Qtr	January	1	1	0	0		0	0	5	0	
	February	2	0	0	0		1	0	5	0	
	March	0	1	5	0		0	2	4	0	
3 <sup>rd</sup> Qtr	April	0	1	3	0		0	1	1	0	
	May	2	2	6	1		0	0	6	0	
	June	0	0	5	0		0	0	6	0	
4 <sup>th</sup> Qtr	July	2	1	2	0		0	2	8	0	
	August	1	0	3	1		1	2	5	2	
	September	2	1	8	1		0	2	7	0	
Total for Year		12	9	41	3	Year to Date	6	12	54	7	
Class A Flight Mishap rate per 100,000 Flight Hours											
5 Yr Avg: 0.95		3 Yr Avg: 1.01		FY 19: 1.15		Current FY: 0.65					

UAS Class A – C Mishap Table											as of 1 Oct 20
	FY 19					FY 20					
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		
MQ-1	9	2	3	14	W/GE	5	2	3	10		
MQ-5	1	0	0	1	Hunter	0	0	0	0		
RQ-7	1	13	38	52	Shadow	0	14	21	35		
RQ-11	0	0	0	0	Raven	0	0	1	1		
RQ-20	0	0	1	1	Puma	0	0	1	1		
SUAV	0	0	0	0	SUAV	0	0	0	0		
					Other	0	0	1	1		
UAS	11	15	42	68	UAS	5	16	27	48		
Aerostat	1	1	1	3	Aerostat	3	0	0	3		
Total for Year	12	16	43	71	Year to Date	8	16	27	51		
UAS Flight Mishap rate per 100,000 Flight Hours											
MQ-1C Class A	5 Yr Avg: 8.40		3 Yr Avg: 5.71		FY 19: 8.77		FY20: 4.82				
RQ-7B Class A-C	5 Yr Avg: 67.39		3 Yr Avg: 78.90		FY 19: 106.20		FY20: 109.51				

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

# Flightfax

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Number 17  
10 February 1982

## Mishap Review: Night Mission in Marginal Weather

*Editor's Note: This scenario is an important reminder that during marginal weather operations each crew must be thoroughly prepared for the mission, ensure their aircraft is mission capable and is not restricted from flight when there is a possibility of instrument meteorological conditions. Leaders should understand the implications of their crews not maintaining their instrument training currency in the aircraft and the simulator. For operations and maintenance, ensure the right crew and aircraft are scheduled for the mission.*

### Synopsis

As the UH-1H pilot in command (PC) was descending on a night visual flight rules (VFR) approach to a lighted pad, he flew into a fog bank. Ground reference was lost. The Huey hit a fence and crashed partially inverted.

### History of flight

The training mission was flown at night. Four Hueys and their crews were assigned to pick up some troops and deliver them to a landing zone (LZ).

The flight left the heliport and proceeded to the pickup zone (PZ). Patches of ground fog were observed, and visibility was restricted. This was consistent with the weather forecast. The first lift was made without incident except that on arrival at the LZ, the pilots of the No. 1 and No. 2 helicopters had to go around on the first approach. After the troops were offloaded, the four aircraft were flown to an airfield to hot refuel.

After refueling, the flight received a special VFR clearance to leave the airfield control zone and went back to the PZ for the second lift. The second lift was completed, with the No. 1 and No. 2 aircraft again making a go-around on their first approach to the LZ. The flight returned to the airfield for hot refueling and then went back to the PZ for the third and final lift. The weather appeared to be deteriorating, with



the ground fog getting thicker. The third lift was completed without a go-around.

The flight took off from the LZ to return to their heliport. One of the aircraft left the formation as prearranged to go to the installation airfield for instrument training. The remaining flight of three continued toward the heliport. When the air mission commander saw haze and patchy fog in the vicinity of the heliport, he told the flight to increase their separation. On the first approach, the No. 1 and No. 2 pilots made go-arounds because of the fog. The No. 3 pilot was able to land on the first approach and parked his helicopter with the lights on as a further reference for the other aircraft. The PC of the No. 2 aircraft, using his searchlight intermittently, made a

second approach and a second go-around, ahead of the No. 1 aircraft.

The No. 2 PC then decided to try an approach to another pad from the opposite direction. On short final, the aircraft entered a thick fog bank. The PC applied power and began a right turn to go around. As he did this, the Huey hit a cyclone fence 600 feet short of and 420 feet left of the runway. The top of the fence was about 20 feet above field elevation. The aircraft turned tail over nose, came to rest inverted on its left side, and burned.

The PC was knocked unconscious. The copilot and crew chief, who sustained minor injuries, was able to move part of the instrument panel off the PC and pull him free of the aircraft before the fire spread.

**Crewmember experience**

The 26-year-old PC had more than 500 rotary wing flight hours, with more than 200 in UH-1Hs. The 26-year-old copilot had more than 200 rotary wing hours, with more than 100 in UH-1Hs.

**Commentary**

The PC used incorrect techniques for a night approach under marginal weather conditions. He concentrated his attention outside the aircraft on his perceived touchdown point and descended too low to clear the fence.

The PC’s lack of recent night flights and no hood and SFTS time in 6 months, plus a stressful night mission (3.3 hours), insufficient crew rest, and less than optimum conditions (special VFR, patchy

ground fog, and no moon), generated fatigue, a desire to get on the ground at the heliport, and apprehension about recovering to the installation airfield with a possible instrument approach.

The aircraft was on a circle red X status and restricted from flight into known or forecast instrument meteorological conditions because the radio magnetic indicator (RMI) on the right side had been removed. The PC decided to fly the aircraft from the left seat, a violation of local regulation. The regulation requires the PC to fly in the right seat in a UH-1H. Assuming the regulation is normally complied with, that decision placed the PC in a comparatively unfamiliar seat with a different perspective in relation to aircraft attitude and instrumentation.

The reconnaissance platoon leader, who was the PC of the aircraft, provided adequate time for crew rest for the other members of his platoon but not for himself. In the 24-hour period before the mishap, the PC had worked more than 17 hours, slept less than 4 hours, and rested at home for about 3 hours.

The heliport was only marginally adequate for night operations, especially during special VFR conditions.

Minimum crew coordination existed between the PC and copilot. Before the flight, it was established that the PC would assume control of the aircraft if they entered instrument meteorological conditions. No supplementary crew coordination was provided by the PC. ■



# Forum **Op-ed, Opinions, Ideas, and Information**

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

## Trust but Verify!

**A**s an aircraft quality-technical inspector (TI), we have a lot of responsibility ensuring the flight safety of our aircrews and the aircraft. Army Techniques Publication (ATP) 3-04.7, Army Aviation Maintenance, paragraph 5-4 states: *The unit commander selects TIs, on orders, based on their skills, qualifications, and experience. Preferably, TIs are Advanced Leader Course graduates. Paragraph 5-8 states: The importance of the technical inspector cannot be underestimated and must be closely managed.*

I arrived at Camp Humphreys, South Korea in the summer of 1990; assigned to B Co, 2<sup>nd</sup> Battalion, 52<sup>nd</sup> Aviation Regiment, "Innkeepers", and at that time we were a battalion comprised of two CH-47D companies, each containing 16 Chinooks. After two months in the maintenance platoon, I was approached by the quality control lead. I had never been a TI, and the lead and I had never crossed paths. For whatever reason, he offered me the TI position, and with a short decision process, I accepted.

To say the least, it was overwhelming: The responsibility, paper maintenance and historical records, TBO board, additional duties such as test, measurement, and diagnostic equipment (TMDE) monitoring, publications account, weight and balance technician, etc. The noncommissioned officer education system (NCOES) only prepared me for what a quality control shop was, but it didn't prepare me for what I was to do. ATP 3-04.7, (back then it was FM 1-511) became very dear to me. Thankfully, I was blessed with a great supervisor and his subordinates that took me under their wings and trained me well.

Now I will share what I like to call a "Life Event - there I was" story. The unit was involved in a field exercise providing support, and certain missions required TI support during the flight missions. The



mission I was on required two CH-47 aircraft to depart the field site, land next to a river, shut down and brief. One aircraft was primary, the other would be a running back-up. I was along as TI support with the primary aircraft up until launch, then I would remain as a passenger during the mission, and the backup aircraft would return to the field site.

So, there we were, laagering on a riverbank in South Korea, and after a few hours of waiting for mission time, it was time to crank. Both aircraft initiated the start sequence, simultaneously, as briefed, but for the primary aircraft, the No. 1 TRANSFORMER RECTIFIER OFF caution light illuminated when the auxiliary power unit (APU) generator was turned on. Pilots initiated their checklist procedures in an attempt to troubleshoot, and with a quick decision, aborted, then transferred to the back-up. Not to leave us without adult leadership, a junior WO1 returned to assist us.

This leads me to the statement "Trust but Verify." So, what does that mean to a mechanic, squad leader, or TI? As we work as a team, we develop working relationships with friends, peers, leadership, and just as important, the pilots. Transformer caution lights - No.1 RECT OFF or No. 2 RECT OFF illumination results in pilot actions of the first step for the pilots with or without a Bus Tie is PDPs (Power Distribution Panels). – Check No Bus Tie



was indicated, so I verbally requested verification of the circuit breakers with a response, which came back "All circuit breakers are in."

**TRUST.**

I trusted the pilots and accepted the response, so immediately after their departure, the flight engineer, crew chief, and I began to troubleshoot. Prior to any operational check or troubleshooting procedure, the task should always be



preceded with a visual check. With that said, ALWAYS follow the technical manual! We didn't do the visual check (my fault), other than to verify the transformer rectifier unit (TRU) wasn't running with the generator turned on. We didn't have a multimeter, so the next best thing in our minds was to swap components to see if the problem follows to the No. 2 side. There is an inherent danger with that; if the No. 1 TRU was inoperative due to electrical damage, we run the risk of damaging another one. Well, we spent the next hour swapping the two components, started the APU but the problem did not follow, and we still have the same caution light.

**VERIFY.**

I looked down at the No. 1 PDP and to my dismay, all circuit breakers were in but the GANG Bar was down which prevented the Bus Tie. When the pilot set his helmet bag down in the cockpit prior to exiting for the brief, he inadvertently opened the circuit by knocking the GANG down. Now, we have guards over the GANG Bars to prevent similar

occurrences. With the APU generator switched off, we reset the GANG Bar, which closed the circuit, switched the APU generator on, and a BUS Tie occurred - problem solved. At this point, it was getting dark, but we did swap the components back, completed a maintenance operational check (MOC), and now all we could do is wait for a second pilot to return. That came in the morning (it was cold that night).

In summary, ATP 3-04.7, Army Aviation Maintenance, Chapter 5 Quality Control, 5-4 Quality Control Technical Inspectors: *The unit commander selects TIs, on orders, based on their skills, qualifications, and experience. Preferably, TIs are Advanced Leader Course graduates.* Experience comes with time, but the commander, the quality control noncommissioned officer in charge (QCNCIOC), and the maintenance/flight crews rely on the TIs to do the right thing. No matter what the task is, or the scenario, or the person; there is no reason not to follow the technical manuals. The pilots could have continued with the primary aircraft, with a near flawless mission, had they followed their checklist. We as the maintainers could have eliminated the unnecessary maintenance and the risk of causing damage to serviceable components had we completed a visual inspection as required by the technical manual. Did I mention it was a cold night? ■

**Michael Ward**  
**Academic Instructor**  
**Special Applications Group (SAG)**  
**Eastern ARNG Aviation Training Site (EAATS)**



# Remember what you teach when the heat pours on...

**W**e've all been there when the senior ranking member for a common task briefs the team on a simple plan, acknowledges the inexperienced members and provides guidance, other experienced members provide additional viewpoints, and a good, effective mission brief is conducted in a short amount of time (even without PowerPoint). I was assigned to F Co, 2-3, TF 3-17 Lighthorse as a CH-47D Chinook crew chief (CE) in Operation Enduring Freedom X and this was my first deployment on flight status. I had finished my readiness level progression just prior to the deployment and had less than 100 hours under my belt when we arrived in theater. Being deployed would build on my training and allow me to grow exponentially.

Two months in, our pilots told us to prep the aircraft while they were briefed on our next mission. Once they came back, the pilot in command (PC) briefed us on the mission, a simple extraction of a platoon that was on a mountain top, where the landing zone (LZ) was affectionately labeled Jameson. The plan was to land, load them up, and fly them to a forward operating base (FOB). The PC identified hazards of the area, outside factors that may affect our mission, and those of us that were inexperienced during the mission briefing. We had a young aviator, myself as the CE, and our door gunner (DG). Our flight engineer (FE) had lots of experience and stepped in as a leader should. He provided guidance to the less experienced crewmembers to be aware of what to look for and when/how to respond. Narrowing down the brief, we basically acknowledged to 'keep our head on a swivel,' and to keep good communication from front to back and



vice versa, which falls in-line with crew coordination procedures.

The FE knew this was the first extraction mission for the DG and I which was outside of the FOB. He looked at me and said, "When we land, lower the ramp and wave them on. Whatever you do, don't step off the ramp! If something goes awry, we will take off and end up leaving you there if you step off the aircraft." I acknowledged with absolute understanding. My FE decided it would be better for him to take the ramp just in case and thus demonstrate it considering he was a great leader. The back half of the aircraft is the responsibility of the FE. It's "his" aircraft after all.

We arrived as planned at the LZ that was situated on the side of a mountain and had a minor slope. The platoon started coming down the side of the mountain towards my side of the aircraft. Keeping my head moving for situational awareness, I noticed my FE lower the ramp as he described. I watched the Soldiers arrive under the rotor system when one of them rolled and tumbled down the rocks. I thought he had tripped or rolled an ankle or something. But, immediately after he rolled downed

the rocks, two other Soldiers jumped to the side and began firing back into the mountain terrain. I saw tracers going in both directions. "Oh gosh!" I thought and immediately reacted by executing my training. Calmly but urgently, I communicated, "Sir, taking fire. We are clear up right," meaning we were clear on the right to take off. Our DG, staying keenly aware of my call, responded, "Clear up left." Now this should have alerted our aviators of the situation. However, they were discussing cockpit procedures or other such things and apparently didn't hear my call. So I repeated it, "Sir, taking fire. Clear up right," and the DG responded, "Clear up left." Again, no response from the cockpit. I repeated a third time with a bit more 'umph' interrupting them. The PC looked out his window, "What are these guys doing?" Me: "Sir! Taking fire! Clear up right!" The PC calmly responded, "Ah... well, do we have anyone onboard?" As I looked to confirm, the FE was raising the ramp and confirmed, "No PAX, ramp up, ramp ready." The PC responded, "OK, are there any Soldiers near us that we may blow over?" I replied, "No Sir, they're taking cover and returning fire." The PC then said, "OK, let's go. Clear up left and right?" The DG and I acknowledged it was clear and took off safely turning away from the engagement.

The Chinook's size is basically a small barn meaning an enormous target. It's not an attack aircraft. The weapons onboard are primarily for self-defense. Our DG could see the firefight quite well after we turned and wanted to return fire but couldn't due to the proximity of our troops to the enemy. At least he had an angle. My gun couldn't traverse high enough to support despite the mountain and troops right in front of me.

We landed at the nearby FOB and listened intently to the radios. Then we started talking about what happened and what we saw. I gave my perspective to the PC to fill in the details. He needed to know because a good aviator will trust his crewmembers in situations where time is in short supply. My FE provided some excellent feedback for my situational awareness development by adding, "Before you mention clear up right, next time you pay attention to where your FE is. I stepped off to wave them on and monitor their entry. You could have left me there on the battlefield." Me: "Wait, didn't you tell me to never get off the ramp?" My FE calmly stated, "We're not going to discuss that at this point in time. The point is you need to know where your other

crewmembers are at all times." Me: "Oh ok..." Our DG just started laughing! At that point the FE decided to switch positions with me since he had 'properly' demonstrated the ramp position during an exfil and could better manage his crew from the cabin door. The gunner continued to laugh, but harder.

We remained at the FOB, ready to go once the LZ was cold. It took about 5 hours and the fall of darkness until we could go back to the LZ and extract the Soldiers. While we waited, our FE shared his insights. "When off the ramp, you can see the wonderful ways of how our troops react to contact and how the enemy used the same color tracers that we do. And when observing these events I realized I should get back on the aircraft now." The DG and I just about fell over.

Once we got approval, we flew back and picked up the Soldiers. First, the walking wounded boarded followed by the rest of the passengers and was completed in one trip. We returned them safely back to the FOB and then delivered the wounded to the next higher medical facility on our FOB. After that mission, our respect and camaraderie grew immensely that day. The deployment continued with more successes, professional growth moments, and an increase in our team cohesion. With each day, we became a more honed team.

After the deployment, eventually, all of us were sent in different directions during permanent change of station moves as is normal for Army life. But we stayed in contact (and still do). The Army is a very large organization but it has its moments when it feels small. Our DG eventually went to the E-5 promotion board at his new unit. When the Command Sergeant Major asked him about the Combat Action Badge he had earned, our DG told the story of LZ Jameson. At the end of his story, the CSM explained that it was he, as the 1SG, and his Soldiers on that mountain that day which we transported out. Then with pride, dismissed him from the board with 150 points! ■

**CW2 Dave Wyman**  
**128th AVN BDE**  
**Ft Eustis, VA**

# Mishap Briefs #95

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

## ATTACK

### H-64



#### E Model

- The crew chief (CE) installed a tail-rotor gearbox on the vertical stabilizer of an AH-64E aircraft. After completing the maintenance, the CE was standing on the vertical stabilizer while lifting the maintenance hoist hook up and out of the way of the vertical stabilizer. While raising the hook, the Soldier lost his footing and failed to observe the hook, which caught part of the vertical stabilizer and raised the aircraft slightly. A supervising noncommissioned officer (NCO) halted the operation upon seeing the aircraft shift. Technical inspectors examined the area and initially noted only minimal damage. Upon further inspections the following day, it was deemed necessary to replace the entire vertical stabilizer on the aircraft. (Class C)

#### D Model



- While conducting a terrain flight approach all four main rotor blades contacted a tree at approximately 50 feet above ground level. The crew executed a precautionary landing to a nearby flight landing strip without further incident. All four blades sustained damage with blades No. 1 and No. 2 significantly damaged. The crew sustained no injuries. (Class C)

#### H-6M Model



- The aircrew failed to verify the throttle was fully open prior to take off. When the aircraft transitioned from ground to air, the aircrew received the "low rotor" audio and realized the throttle was not fully open. The aircrew then rapidly increased the throttle to full open resulting in an over torque. (Class C)
- When a primary mission aircraft experienced a maintenance issue, the crew bumped to a spare aircraft. In the dark, the crew did not notice that the aft blade remained tied down during the walk

around prior to crank. During start, the aircraft reached 40 percent Np before the crew realized the blade was tied down. (Class C)

## UTILITY

### H-60



#### L Model

- The crew was conducting day, visual flight rules, multi-ship readiness level progression/ environmental training. While executing an approach to a dusty landing area, the aircraft landed hard resulting in damage to a main rotor blade and the fuselage. (Class B)

## UNMANNED

### RQ-7V2



- During a Joint Readiness Training Center rotation, a crew launched a UAS and lost link on the main terminal following launch. The backup terminal was operational; however, the engine setting on the backup terminal was set to idle. When the backup terminal captured the link, the terminal commanded the UAS engine to idle. The UAS impacted the ground 336 feet from the launcher and came to rest 546 feet from the launcher. (Class C)

Visit the U.S. Army Combat Readiness Aviation Division at: <https://safety.army.mil/ON-DUTY/Aviation>

**Resources**

- Publications Forum
- Leader's Guide to Safety and Crew Endurance - ACD login required
- SARFA
- Major Accident Reports - ACD login required
- Staff/Escorts - ACD login required
- Aviation EOC Support Equipment
- Flight Surgeon Walk to Safety and Knowledge Center

**Most Requested**

- Flightfax
- English Russian Protocol
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# Flightfax

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Maintenance doesn't stop just because the weather turns cold. Army Technique Publication (ATP) 3-04.7, Army Aviation Maintenance, states in Appendix E, Aviation Maintenance in Extreme and Demanding Environments: "This appendix provides a discussion of the impact on aviation maintenance operations within the various environments. Each environment brings unique challenges that must be anticipated and planned for by the commander and staff. Some maintenance procedures work consistently regardless of the environment; however, the majority of maintenance activities are directly affected by the environment."

Of the environments, which most are very harsh to equipment, aircraft, and personnel, cold weather operations are more equipment intensive. What should aviation commanders, crewmembers, and maintenance personnel be familiar with so their unit is ready to conduct maintenance operations in the extremes of cold weather climates?

### **General Cold Weather Environment Considerations:**

- Cold Weather operations require a considerable amount of specialized equipment; such as tracked vehicles, sleds, heated shelters, heated facilities, and aircraft modifications. Every item of equipment is affected by extreme cold and snow in the winter.
- Helicopter operation, particularly with their inherent vibrations, in temperatures below -35 degrees Fahrenheit results in a marked increase in metal fatigue. All metals become increasingly brittle as the temperature decreases. Aircraft fatigue is evidenced by an increased number of skin cracks and popped rivets in stress areas. Careful attention must be devoted to these areas in all stages of maintenance operations. Areas to inspect on a more frequent basis for stress cracks, as a direct result of the environment include but are not limited to the following: engine decks, tail-boom hard points, and gearbox mounting points.
- Operation of aircraft at temperatures below -50 degrees Fahrenheit should not be attempted except in emergencies; unless the aircraft has the appropriate winterization kit and auxiliary systems that have proven reliable at lower temperatures. Lubrication products must be examined to determine if they are sufficient for operations in extreme cold environments.
- Unit leaders must ensure personnel and equipment can withstand the challenges of cold weather. Soldiers and their leaders must understand the effects of cold weather and adapt operations and maintenance to overcome environmental conditions. Operations in snow, ice, and extremely cold conditions require special training, personnel acclimation, and special operational techniques.
- At temperatures below -20 degrees Fahrenheit, maintenance tasks may take five times as long to complete.
- Maintenance units usually require additional personnel to offset the increased time necessary to complete maintenance tasks.

### **Maintenance Risks in Cold Environments:**

- Personnel efficiency is reduced by bulky clothing worn in extremely cold environments.
- Losing the sense of touch (wearing gloves/mittens) further reduces the Soldier's efficiency.
- Complete winterization, diligent maintenance, and well-trained maintenance teams are crucial in reducing the adverse effects of cold weather and performing maintenance in a timely manner.
- Without some type of permanent or temporary shelter, even routine maintenance can become extremely difficult, if not impossible to perform.
- During certain times of the year, hours of daylight in a northern environment are short. Lighting equipment must be available and in sufficient quantity to furnish adequate illumination for maintenance services. Lights with ample cable extensions, attachment plugs, connectors, and spare bulbs are a necessity.

## 5 Questions

1. What ATP covers Army aviation maintenance?
2. Cold weather operations always require less maintenance personnel to perform a task? Yes/ No?
3. A unit doesn't have to train in cold weather to understand its effects on personnel and equipment? Yes/ No?
4. ATP 3-04.6 is the manual I can look in to find out about maintenance in a cold environment? True or False?
5. What areas should I inspect more often in cold weather environments?

# UAS COLD WX

*Stay focused, shortcuts have "Impacts"*

Preflight using  
the checklist



Make sure your UAS has no  
snow or ice on the airframe



Use the proper techniques  
to remove snow and ice



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