Number 39 July 2014

Flightfax®

Online newsletter of Army aircraft mishap prevention information

The past two months of *Flightfax* focused on mishaps due to loss of situational awareness while operating in degraded visual environments that has historically contributed to around 24 percent of our aviation flight mishaps. We also highlighted the aircrew coordination objective "cross monitor performance" as one of the pilot in command's key tools that can be used to counter the effects of spatial disorientation. In a larger sense, aircrew coordination is a pilot's main method in preventing the mistakes that lead to human error mishaps. The implementation of our formalized aircrew coordination training program has been the single most important factor in reducing Army Aviation's flight mishaps down to historic lows.

In a study published in 1990, and referenced in this month's Blast from the Past article, it was noted that over 74 percent of the Army's Class A-C mishaps were attributed to crew coordination errors. This significant crew error rate, combined with aircraft flight mishap rates averaging over 3.0 Class A accidents per 100K flight hours, clearly highlighted that something needed to change. The good news is the ACT program has been proven to be very effective. The most recent U.S Army Combat Readiness/Safety Center loss statistics show that despite operating in the complex operating environment of OEF and OIF, the FY02-FY14 percentage of Class A mishaps with aircrew coordination as a contributing factor has been reduced down to 42 percent (128 Class As with crew coordination errors out of 304 total Class A flight mishaps) while at the same time our total Class A mishap rates have been reduced to less than 1.5 per 100K flight hours.

The lesson learned from this is that our ACT program works...BUT MOST IMPORTANTLY it is that aircrews have to use the principles of aircrew coordination to reap the benefits. USACRC/SC analyzes flight recorder data, including the recorded voices of the crew's interactions, to help determine the contributing factors in mishaps. In the majority of the mishaps, most aircrews are communicating positively and are working through their problems. However, in a sizable percentage of the mishaps, it is appalling to hear the lack of crew coordination from our RL1 ACT qualified aircrews. In one glaring example, an aircrew, during a NVG combat operation, while conducting an approach to an unprepared HLZ, did not say a SINGLE word in the cockpit for over three minutes even though they were RP inbound for landing. No before landing checks, no LZ brief, no discussion of go-around plans or actions to be taken in a contingency, no conversation about weapons control status, no announcement of HLZ suitability or calls of dust by the non-rated crew members. Complete silence in the cockpit until the aircraft terminated at an OGE hover in a dust cloud. The crew subsequently lost control of the aircraft and struck an obstacle. This is an extreme example, but it is happening in everyone's formation. USACRC/SC's key buzzwords, like complacency and over-confidence, leads to circumstances like this. This crew thought they had it…when in reality they didn't and the end result wasn't good.

Pilots in command are the key to establishing a positive crew coordination environment. It starts with good pre-mission planning, continues through a good crew brief where everyone's role in the mission is openly discussed, and is reinforced in the aircraft with the upcoming phases of flight continually discussed. When a PC actively communicates, good things happen. If the PC is not talking, then the pilot or NRCM should begin the dialog by offering assistance or asking questions to get the information flow going. Your announcement in the cockpit could be the one piece of information needed that could potentially break the accident chain and prevent the mishap.

ACT is proven. The USACRC/SC mishap statistics clearly show that the system works. Now it is up to you to put it into action.

Until next month, fly safe and manage your risk levels!

LTC Mike Higginbotham
Aviation Director, Future Operations
US Army Combat Readiness/Safety Center
email: michael.d.higginbotham.mil@mail.mil

Sometimes experience doesn't come from flying

Experience is something you don't get until just after you needed it…

If you couple that line with the phrase "there are no new accidents" then you are left with the thought of why do we continue to repeat the hard lessons from bad experiences. There is no real answer to the question other than we continue to re-learn the lessons because experiences fade with time or are not distributed to the masses. If solutions are not engineered or procedurally corrected, then the same accidents will periodically re-appear to those who were never exposed, and thus, never learned from someone else's bad experiences.

There are a lot of different ways to exploit the experience factor, especially as it pertains to the accident prevention effort. You can have the first-hand experience where you are involved in the act or incident. Or you may be one of those who are present to observe an event but were not totally involved. Both of these experiences will generally leave a lasting impression that you will carry throughout your aviation career, lowering your probability of repeating the occurrence. You have learned from it, stuck it in your rucksack and pull it out when similar circumstances arise.

A third, and probably the most popular and frequent way of gaining experience, is to have it come to you via some form of presentation. Whether it is in the classroom, hangar flying with peers, mentoring, tribal lore or through the more formal process of AARs and lessons learned, you absorb someone else's previous encounters. You may just read about it and identify with it by placing yourself in the situation and thinking what actions you would have done. The whole concept is that of passing on someone else's experiences (the good and the bad things) so that the good can be built upon and the bad can be discarded.

In conducting evaluations, I was somewhat old school. I liked to train, even while evaluating. One of my favorites was in the realm of performance planning. During training or evaluations, I typically had the individual complete the performance planning card manually using the charts in the operator's manual. This went out of vogue as the automatic programs came into play but I held on as long as possible. Yes, the programs were quicker and accurate, but I always felt a pilot was better served knowing how the numbers came about and the best way was with the good old fashioned chart and pencil. I'm not talking all the crazy stuff they added to the card over the years, just the basic, important stuff.

"Give me the emergency procedure for a single-engine failure at cruise" would be a typical start point. Relatively easy, not too many underlined steps. Response was always quick and sharp "collective adjust, external stores, continued flight not possible – land as soon as possible, continued flight possible – land as soon as practicable…" Very good, young Lindberg.

"Now tell me about your decision making process in determining whether single engine flight is possible." A general quizzical look would often be the reply. "You know – what factors are you taking into consideration in making your decision that you can no longer keep it airborne," I would prompt. "Like - what airspeed are you using?" "80 knots" was a typical response. "Perhaps, yeah, that may be a good starting point, but is it the best airspeed?" I would return. Again, fluctuations in the response mechanisms would be noted. You could sometimes drag out single-engine airspeed ranges as depicted on the card but I seldom got a full sense of understanding from the less experienced.

Continued on next page

Continued from previous page

To cut to the quick I would boil it down to "At conditions that are on the margin for single-engine flight, based on your PPC data – what are you reading for torque, TGT, airspeed, and VSI (that's old school vertical speed indicator) in determining if further flight is possible?" Rather than walk through the tooth extraction exercise of how I would pull this information from the individual, I'll just summarize the discussion:

Answers to the above question would be: 1) Airspeed at or near your max rate of climb/endurance airspeed. This "bucket" speed would require the least amount of power to be applied to maintain level flight which means that it allows the maximum amount of power that is available to be applied to your emergency situation; 2) Torque should be at your max torque available single engine. Ideally, this would be the structural/transmission limit outlined in Chapter 5, but generally it is less due to environmental conditions limiting the output of your engine. Which leads into 3) TGT. Your numbers should be at the TGT limiting factor which should correlate to the max torque available if it is an environmental restriction to your power. So, if you've applied the max power you have available via your TGT and torque and have your airspeed at your max rate of climb, you've done everything you can do to make this aircraft fly (OK - check your trim). Look at your VSI. Are you level or climbing? If you are, then you are in a land as soon as practicable situation. Are you descending? If yes, guess what, you are in a land as soon as possible mode and must consider other options such as jettisoning the wing stores or releasing the external load that may be hanging below you. The more altitude you have, the more time for decision making. If you are close to the margins, you may be able to maintain a descent until the environmental conditions get within parameters that allow further flight. In any case, holding those parameters should get you near the least rate of descent. If you don't have altitude, many of your decisions are made before you take-off. Hauling a sling load with no single engine capability lets you know you have to get rid of it quickly to keep flying. Are you working the mountain tops with no single-engine capability? Then keeping your airspeed up, dumping your stores and pointing it toward a valley when the engine conks should be in the back of your mind as you pass beyond the limits of single-engine flight capability.

Often, showing how to correlate the numbers was like turning on a light switch. Having them walk through the charts helped imprint in them where these magical numbers were created and what they meant. Once the light was on, additional factors could be brought into play such as wind, calibration factors, angles of bank, drag, etc. that could also affect performance, capability, and indications.

This method of presentation was passed to me from one of my instructors. It could be reinforced in the simulator or demonstrated in the aircraft. Once learned, whenever you see practical versus possible, you can't help but bring those gauges into your decision making process.

'Learn from the mistakes of others - because you won't live long enough to make them all yourself' is a phrase that captures the idea of transferring experience. Substitute the word 'experience' in place of 'mistakes' and the meaning broadens to include the positive events that are of equal importance in in building your own knowledge/experience base.

Jon Dickinson, Aviation Directorate

Emergency Procedures

CW3 Danny G. Eudy
Utility Branch UH-72A/Mi-17
Directorate of Evaluation and Standardization
U.S. Army Aviation Center of Excellence
Fort Rucker, Ala

Flying and maintaining helicopters in today's modern Army is a rewarding and gratifying experience. With the advancements in aircraft performance and avionics that were not available a decade ago, we as aviators find ourselves operating some of the most advanced military helicopters in the world. Because of these advancements in technology, aviators are finding themselves operating as system managers instead of the hands-on aviators we envisioned in flight school. If set up properly, the aircraft of today have the ability to fly from Point A to Point B, VFR or IFR, with little input by the aviator.

Area navigational equipment, three and four axis autopilots, flat panel displays, and engine monitoring systems are all designed to reduce pilot error and workload. Aviators today can quickly and accurately monitor the health of their aircraft while maintaining their exact location in all modes of flight, to include nap-of-the-earth and IMC conditions. The situational awareness provided by these systems is allowing aviators to concentrate more on mission execution instead of aircraft control or pending limitations. The shortfall of these advantages is the need for higher skilled and competent aviators to fly these advanced systems, aviators who can confront unplanned mission changes or aircraft emergencies and effectively and accurately diffuse the situation without compounding the issue through system ignorance.

Emergency procedure training is critical to every aircraft that is flown by the Army, more so now than ever due to the multitude of systems that can fail. The saving grace is that the majority of the helicopters in the inventory have similar emergency procedures and therefore make standardization throughout the fleet easier. One particular procedure common within the UH-72A community and the AH-64 community is Single Engine Failure Out of Ground Effect. For the UH-72 mission set, out of ground effect engine failure could occur during confined area departures, during hoist operations, or when implementing the mission equipment package during drug interdiction missions. If properly diagnosed, there are two safe courses of action: a commitment to a forced landing, or a transition to One Engine Operating (OEI)-Flight.

Procedure

1. Collective lever - Adjust to maintain rotor RPM
2. Airspeed – Increase if possible

FORCED LANDING

3. Landing attitude – Establish
4. Collective lever –Raise as necessary to stop descent and cushion landing.

After Landing:

5. Affected engine – Identify
6. Single engine emergency shutdown – Perform

Continued on next page

Continued from previous page

TRANSITION TO OEI – Flight
3. Collective lever – Adjust to OEI-Limits or below
4. Rotor speed – Trim to maximum
5. Airspeed – Gain, 65 KIAS (Vy)
After reaching safe altitude:
6. Collective lever – Reduce to OEI MCP or below
7. Affected engine – Identify
8. Single engine emergency shutdown – Perform
9. LAND AS SOON AS PRACTICABLE

The ATM states that when performing this maneuver during training, a minimum out of ground effect hover (HOGE) of 250 feet above ground level (AGL) and only the fly away procedure will be used due to run-on landing restrictions in the UH-72. Standard bullet #4 for the maneuver, **Trim Rotor RPM to Maximum**, requires that the pilot on the controls, after identifying an engine failure, immediately lower the collective and gain airspeed and determine if the landing will be a forced landing or a transition to OEI-flight. When transitioning to OEI-flight, #4 of the emergency procedure requires the rotor speed be trimmed to maximum. Additionally, this particular aspect of the emergency procedure, if not executed properly, could lead to a low rotor condition in addition to the operating engine not being utilized properly. The trim actuators are controlled thru a 4-way trim switch located on the collective. Four different engine trim operations are possible through this switch:

- Forward: The power of each engine is increased simultaneously; i.e. NR is increased
- Backward: The power of both engines is decreased; i.e. NR is decreased
- Left: The power of Engine No. 1 is increased, while the power of Engine No. 2 is decreased; NR remains constant.
- Right: The power of Engine No. 2 is increased, while the power of Engine No. 1 is decreased; NR remains constant.

One area that is not covered in the manual or ATM, is the relationship between the pilot and copilot's trim switch when performing this maneuver and the proper application of trimming the rotor to maximum. Upon identifying an engine failure, the pilot will execute the emergency procedure. By pressing forward on the trim switch, the pilot is not trimming to either one engine or the other, but instead is increasing the power output of whichever engine is operating correctly, thus increasing NR rpm. If the pilot on the controls inherently slews the trim switch to the failed engine, NR will not increase and, if the collective was not reduced properly, a low rotor condition may occur. Secondly, if either the instructor pilot or co- pilot recognizes the incorrect application of the switch they will not be able to override the pilot on the controls who has already manipulated the trim switch to the failed engine. The pilot on the controls will have to disengage their switch in order for the copilot's switch to operate. With the low altitude and the reaction time associated with this maneuver, crew coordination, reaction time and correct manipulation of the flight controls is critical to the safety of flight and the well being of the flight crew.

From the archives

During readiness level progression training, the standardization pilot (SP) was performing a one engine inoperative (OEI) simulated engine failure. The SP climbed to 150 feet above ground level, just behind the precision approach path indicator (PAPI) lights and initiated the maneuver. During the landing portion of the maneuver, the aircraft struck the PAPI light which forced the aircraft nose forward and the right skid struck the ground. The aircraft bounced into the air and made a 360 degree rotation to the right before hitting the ground again. The aircraft continued to rotate another 90 degree before coming to rest facing 070 degrees. The SP sustained minor injuries and the aircraft received Class B damage.

All information contained in this report is for accident prevention use only. Access additional accident report information on the CRC RMIS https://rmis.safety.army.mil/ AKO Password and RMIS Permission required.

For your consideration… You're down-range in a single-engine aircraft. You're doing your business and get an engine chip light. Somewhere in the response you are supposed to land as soon as possible. There are open areas in which the aircraft can be landed, but due to threat considerations your definition of nearest suitable landing area includes security. The FOB is a bit farther away, but definitely more secure than open bad guy country. Talk amongst yourselves on what decision you would make in similar circumstances.

Let's say you elect to push for home base. Fine – decision made - head for home. I'm neither for or against your decision, but I do question the need to fly at max power and airspeed at 75' AHO to get there. You have indications of an engine problem. Do you really need to apply max power on an engine that may have a problem and could quit at any time? No, you don't. Set the parameters so that, if you have to, you are able to initiate an autorotation in the event the engine should fail. Seventy-five feet at max speed with a heavy aircraft is not where you need to be with an engine chip light. Set yourself up for success.

Mishap Review: UH-60M NVG Insertion

During the conduct of a NVG troop insertion in degraded visual conditions, the UH-60M's main rotor RPM decreased. The aircraft descended and contacted an obstacle with the main rotor. The aircraft crashed. There was one fatality and nine injuries.

History of flight

As part of a 24 hour stand-by duty cycle, the crew reported at 0900L, received their O & I brief at the TAC followed by preflight, run-up and a HIT check before assuming a stand-by/rest posture. The mission risk assessment and brief were completed the day prior. The mission was briefed as a medium risk due to threat, low (red) illumination, brown-out conditions and crew experience. The risk assessment was reviewed and signed by both the CAB commander and the DCG as the final risk approval authority. The weather was clear sky conditions with seven miles visibility. Winds were 310 degrees at 03 knots. Temperature +26 C. Sunset 1945L. Moon illumination 0% with a moon angle below the horizon. Accident site elevation was approximately 5,500 feet MSL.

At 2215L the crews were alerted to report for an air mission brief. The mission was a two-ship NVG insertion of a QRF for LZ security in support of an un-partnered MEDEVAC mission. Included in the package was an aerial weapons team (2 x AH-64s) and two MEDEVAC UH-60s. The air mission brief was conducted at 2235L. The weapons team departed at 2305L followed by the QRF at 2210 and the MEDEVAC aircraft at 2215L. At 2230 the QRF arrive vicinity of the HLZ with the accident aircraft in the lead position of the flight of two.

The accident aircraft conducted an approach to a high hover (100') approximate 300 meters north of the designated HLZ. Unable to see the intended landing site due to the forming dust cloud, the crew decided to go around, find the HLZ and re-attempt the landing. While initiating the climb, the main rotor rpm drooped. The aircraft moved forward and down through the dust cloud and struck a cell phone tower located to the front of the aircraft. The impact with the tower and subsequent ground impact caused catastrophic damage to the aircraft, one fatality, and nine serious injuries.

Crewmember experience

The IP, sitting in the left seat, had 840 hours total flight time, 750 in the UH-60, 41 as an IP, with 135 NVG and 36 combat. The PI had 700 hours total time, 575 UH-60, 115 NVG and 37 combat. The left rear CE had 220 hours, 55 NVG, 20 combat and the right rear CE had 290 hours, 85 NVG with 30 combat.

Continued on next page

Continued from previous page

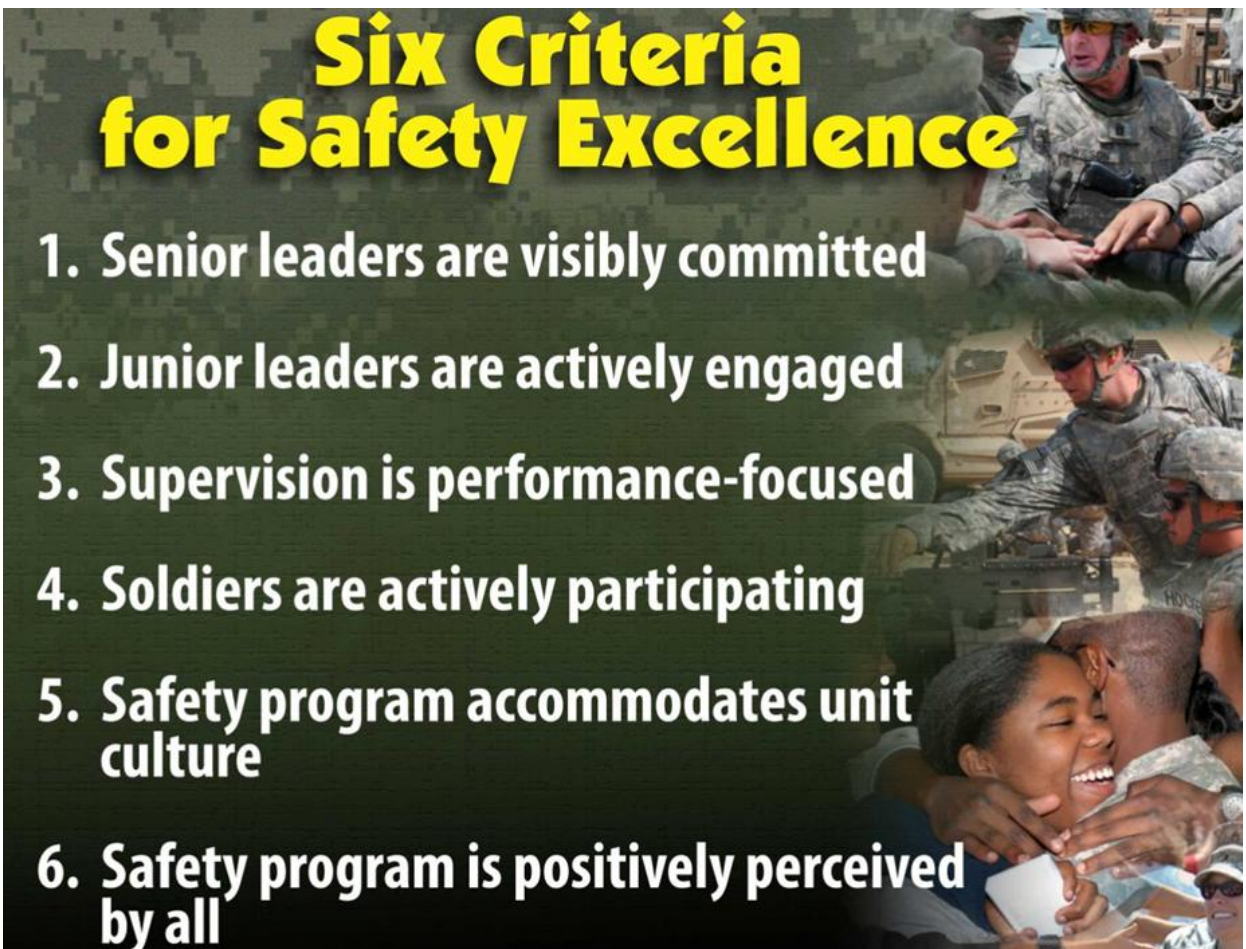
Commentary

The accident investigation determined that while attempting an NVG takeoff from an OGE hover in a degraded visual environment, the crew failed to maintain rotor RPM and inappropriately responded to the emergency. It also determined the selected crew experience levels did not match the requirements needed for the hasty mission execution into dusty landing areas under zero illumination with narrow power margins.

Additionally, the crew failed to properly communicate and coordinate with each other in that they did not offer assistance, share work load, or cross monitor the performance of the pilot on the controls.

It was also determined that the aerial reaction force (ARF) team unbuckled their seat belts prior to landing in contravention of AR 95-1. As a result, part of the team was thrown from the aircraft during the crash resulting in one fatally.

All information contained in this report is for accident prevention use only. Access additional accident report information on the CRC RMIS https://rmis.safety.army.mil/ AKO Password and RMIS Permission required.



Class A – C Mishap Tables

	Manned Aircraft Class A – C Mishap Table									as of 29 Jul 14
	Month	FY 13					FY 14			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities
1st Qtr	October	1	0	7	0		0	0	1	0
	November	0	1	5	0		3	0	5	0
	December	2	1	0	0		1	0	3	0
2nd Qtr	January	0	0	6	0		3	1	4	4
	February	0	0	2	0		1	0	3	0
	March	2	1	5	6		0	3	0	0
3rd Qtr	April	1	1	6	2		1	1	4	0
	May	0	0	6	0		3	1	2	2
	June	1	1	4	0		2	0	5	0
4th Qtr	July	1	0	6	0		2		1	
	August	1	1	9	0					
	September	0	1	1	0					
	Total for Year	9	7	57	8	Year to Date	16	6	28	6

UAS Class A – C Mishap Table									as of 29 Jul 14
	FY 13					FY 14			
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total
MQ-1	5	1	0	6	W/GE	3		4	7
MQ-5	2	0	3	5	Hunter	1	1	1	3
RQ-7	0	4	10	14	Shadow		11	3	14
RQ-11					Raven			1	1
RQ-20	0	0	6	6	Puma			1	1
YMQ-18									
SUAV					SUAV				
Aerostat	2	3	1	6	Aerostat	3	2	3	8
Total for Year	9	8	20	37	Year to Date	7	14	13	34

"Our accident rate would certainly be better if Black Hawk drivers would learn to ground taxi and Apaches could get out of a FARP."

As strange as it may sound, I actually heard that phrase in a discussion (not word for word but close). To be truthful, I can find no fault in it.

On the surface, it's not obvious to understand the meaning behind the phrase but it is really not that difficult. Last year was one the best years for Army aviation with nine recorded Class A flight mishaps. Two of those were ground taxi mishaps. There have been two again this year. And in previous years, you will find several more sprinkled throughout the wheeled aircraft fleet. In my view, all of them were preventable. Just step on the brakes and don't take chances. Simple solutions for a simple problem. I refer you to the September 2013 issue of *Flightfax* for a more detailed discussion on taxi mishaps.

As far as the Apaches and the FARP situation, that is a subtle reference to power management issues. An Apache flies into a FARP empty of fuel and ordnance, replenishes, and then, while attempting to depart heavy, encounters a decreasing rotor situation resulting in a mishap. Obviously, power management isn't an Apache-only issue, and it certainly isn't a FARP-only situation. But the pretext is the same. Aircraft operating hot, high and heavy have to pay attention to the numbers as well as the other things. Things like ensuring you're utilizing the wind to your advantage, even if it is a bit more inconvenient to reposition into it. Or reminding yourself that fudging the numbers on performance capabilities by trying to catch the needle (digit) bounce to make those power check numbers fall within parameters so it's 'legal' to pull pitch won't help you when the low rotor sounds. Did you even do a power check? Does the crew discuss the power requirements, wind, and obstacles on every take-off and landing so the crew situational awareness is at its peak during the maneuver?

Without delving into all the crew coordination elements, basic qualities, and objectives, it should be recognized that good crew coordination will help eliminate the two above mentioned situations. It is hard to imagine a ground taxi situation that puts a rotor system in close proximity to a hazard without some form of crew discussion. Most obstacles that are struck are readily identifiable to the crew. What apparently isn't readily identifiable is the required clearance from said obstacle. That's where 'don't take chances' comes in play. If there are doubts - discuss it. If you are in an unfamiliar location with limited visibility (i.e. night) then the crew talk should be addressing how to proceed in the most cautious manner with all crewmembers focused on hazard identification.

When an aircraft is operating close to power limitations the crew should be communicating what they have available and what they need - as well as the factors that may influence those requirements. A few knots of wind from the wrong direction can negate the safe operating margins that were planned. It goes without saying you need to know and understand what the numbers mean. Just because your wingman scraped by getting airborne doesn't me it will happen for you. He/she is probably a better pilot.

Talking amongst yourselves (or as the ATM might say it - the exchange of information that allows for the flow of essential data between crewmembers and cross monitoring each other's actions and decisions to reduce the likelihood of errors) will always have a positive impact on mission performance and safety. Crewmembers need to keep each other informed about the status of the aircraft and the mission. Information exchange helps that aircrew maintain a high level of situational awareness. **Jon Dickinson, Aviation Directorate**

Aircrew coordination: Don't take it for granted 5 Dec 1990 *Flightfax*

***Crew coordination:* The interaction between crewmembers (communication) and the actions (sequence or timing) necessary for tasks to be performed efficiently, effectively, and safely.**

Most aircrew tasks have elements that require crew coordination; however, until recently, the importance of crew coordination had not been fully addressed in policy, procedures, training, or operations. The impact of this was revealed in a recent study of rotary wing accidents occurring during the past six years. The study determined that crew coordination failures were responsible for approximately 74 percent of all Class A - C rotary wing flight accidents. These failures doubled over the period studied, primarily because of the high coordination demands of night operations. Six types of crew coordination failures were identified:

1. Failure of the pilot on the controls to properly *direct assistance* from other crewmembers; for example, to direct the pilot not on the controls to provide information on airspeed, altitude, rate of closure, engine/flight instruments, or assist with aircraft clearance and control. The increased demands of night-aided tactical terrain missions require the pilot on the controls to use all available resources for assistance. Crew coordination and tactical coordination are competing demands, but crew coordination, especially to ensure obstacle clearance, must be top priority in operational situations where flight safety might be compromised.

2. Failure to *announce a decision* or *action* that will affect the ability of other crewmembers to properly perform their duties. Examples include discontinuing outside clearance to tune radios or read maps, initiating NOE turns, and making inputs or assuming flight controls unannounced. A crew cannot be an effective team if any member operates independently.

3. Failure to maintain *positive communication* (verbal and nonverbal). Positive communication implies that transmitted information is clear and unambiguous. Three key words define communication as being "positive": transmit, acknowledge, and confirm. For communications to be complete and effective, the transmitter must ensure that the receiver has heard and understood the message. This is accomplished by acknowledgment on the part of the receiver (for example, "Roger") and verification that the meaning of the transmission was understood (such as repeating the original transmission). Positive communication is further enhanced by using standard terminology with specific qualifiers. This ensures that the words used have the same meaning to all parties concerned. The following example of positive transfer of controls is a good illustration of what we mean by positive communication:

"I've got the controls" (transmit).

“You've got the controls" (acknowledge).

"I've got the controls" (confirm).

Communications critical to safe aircraft operation cannot be assumed simply because the message was transmitted.

4. Failure of the PIC to properly *assign crew responsibilities* prior to the mission during the crew briefing or during the mission for situations encountered. Responsibilities for aircraft clearance and assistance to the pilot on the controls must be clearly assigned and understood during the crew briefing. Desired assistance to the pilot on the controls should be specified in terms of what, who, when, and how. For aircraft clearance (what), who (which crewmember), when (priority), and

Continued on next page

how (technique) should be addressed.

5. Failure of the pilot not on the controls or other crewmembers to *offer assistance or information* that is needed or has been previously requested by the pilot on the controls. Crewmembers must anticipate when assigned assistance will be needed and not wait until the pilot on the controls requests it. Also, each crewmember must be alert and ready to assist in unanticipated situations requiring teamwork; for example, aircraft emergencies and environmental obscurations to vision.

6. Failure of the pilot on the controls to execute flight actions in *proper sequence* with actions of other crewmembers. Examples include initiating taxi turn before crew chief can clear the tail, releasing sling-load before receiving crew chief's clearance, and taking off before completing before-takeoff checks. Actions that are executed out of sequence - too soon or too late in conjunction with the actions of other crewmembers - can disrupt the entire "flow" of a mission or even bring it to an abrupt end.

Following are the operational profiles in which these crew coordination failures most frequently occurred. Included are summaries of actual accidents that illustrate the operational profiles and crew coordination failures involved.

Profile 1

Failure of pilot on controls to properly direct assistance from pilot not on controls during night tactical missions.

An AH-64 was on a tactical terrain night systems currency evaluation mission, flying NOE, when the PNVS video imagery deteriorated. The IP (rear seat) decided to troubleshoot the PNVS without first directing assistance from the CP; i.e., telling him to take the controls. While both pilots had their attention inside the cockpit (CP was reading a map), the aircraft went into a gradual undetected descent and struck trees.

Profile 2

Failure of pilot not on controls to announce decisions during en route phase of day tactical terrain missions.

While on a day NOE tactical training mission, an AH-IF was descending to mask behind trees. The PIC (rear seat) diverted his attention from outside (where he was assisting in obstacle clearance) to inside the cockpit (to establish his location on a map). He failed to announce this decision to the CP (who was on the controls) so the CP would assume total responsibility for clearing the aircraft. As a result, the main rotor struck a tree on the right side of the aircraft.

Profile 3

Lack of positive communication by pilot not on controls during landing phase of day missions.

A UH-60A on a day tactical troop insertion mission was making an approach to a large open field bordered by trees. On short final, the IP told the pilot on the controls (right seat) that they were getting too close to the tree line on the left. However, he failed to confirm that the pilot understood the warning and took necessary corrective action (lack of positive communication). Instead, after warning the pilot, the IP started looking at his map. The aircraft hit the trees. When questioned, the pilot said he had not heard the IPs warning.

Profile 4

Failure of pilot not on controls to offer assistance to pilot on controls during day missions.

Continued on next page

A UH-l was on a day cross-country administrative mission over snow-covered terrain. The CP was attempting to maintain a stationary 25-foot OGE hover while awaiting return of the lead aircraft (which had turned around because of adverse weather). The PIC was focusing his attention inside the aircraft and failed to **offer assistance** to the CP in maintaining altitude through use of outside references. The CP fixed his attention on the returning aircraft and failed to detect rearward drift and descent, resulting in impact with the ground.

Profile 5

Failure of PIC to properly assign responsibilities during crew briefing.

An OH-58A was on a day search and rescue mission. While both pilots had their attention on the ground search, the tail rotor hit a tree, and the aircraft crashed. The PIC failed to properly **assign responsibilities** during the crew briefing; i.e., one crewmember responsible for obstacle clearance while the other crewmember conducted ground search.

Profile 6

Failure of pilot on controls to properly coordinate (sequence) action with crew chief in clearing aircraft during hover/taxi phase of administrative/support missions.

A CH-47, on a day support mission, landed at a small airfield (with no taxiway markings) for refueling. The PIC ground-taxied the aircraft near a hangar and, concerned that the aircraft was too close, decided to reposition. He received clearance to the right from the flight engineer but failed to wait for clearance from the crew chief **(improper sequence of actions)**, who was lowering the ramp in order to clear aircraft's left rear. Consequently, when the aircraft turned right, the rear of the aircraft swung left, and the aft rotor struck the hangar.

Where do we go from here?

This study has generated actions to focus the Army aviation system on crew coordination requirements. Critical crew coordination actions are being included in each ATM task for all aircraft, and changes to training and evaluation will follow. At the same time, in order to prevent accidents, it is imperative that every Army aviator understand the importance of crew coordination. It is easy to become complacent and assume the other crewmember knows your intentions; however, failure to "crew coordinate" can lead to disastrous consequences. •

Don’t hold your flatulence. It travels up the spine to the brain causing crappy ideas and decisions that stink.

Subscribe to Flightfax via the Aviation Directorate Website: https://safety.army.mil/atf/

Selected Aircraft Mishap Briefs

Information based on Preliminary reports of aircraft mishaps reported in June 2014.

<u>Observation helicopters</u>

H-6M 

-Aircraft experienced a rotor overspeed during FADEC manual operations. (Class C)

<u>Attack helicopters</u>

AH-64D 

-Aircraft drifted into trees during NVD training mission. Aircraft came to rest on its right side. (Class A)

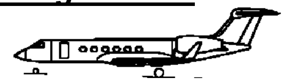
-Aircraft experienced an overtorque during a single-engine roll-on landing maneuver. (Class C)

<u>Cargo helicopters</u>

H-47 

-Aircraft sustained damage to the left aft landing gear during an insertion. (Class C)

<u>Fixed Wing Aircraft</u>

C-37B 

-Crew experienced a bird strike during a touch and go landing. Post landing inspection revealed damage to the right engine cowling. (Class C)

<u>Unmanned Aircraft Systems</u>

MQ-1C 

-System crashed while on normal approach to land. (Class A)

RQ-7B 

-Following climb-out to altitude, UA experienced engine failure. Crew activated the FTS. UA recovered with damage. (Class B)

MQ-5B 

-During touchdown, the UA contacted the arresting gear system on the side of the runway with the stabilizer and right landing gear. (Class C)

Experience is something you don't get until just after you needed it…

Subscribe to Flightfax via the Aviation Directorate Website: https://safety.army.mil/atf/

If you have comments, input, or contributions to Flightfax, feel free to contact the Aviation Directorate, U.S. Army Combat Readiness/Safety Center at com (334) 255-3530; DSN 558

U.S. ARMY COMBAT READINESS/SAFETY CENTER

Report of Army aircraft mishaps published by the U.S. Army Combat Readiness/Safety Center, Fort Rucker, AL 36322-5363. DSN 558-2660. Information is for accident prevention purposes only. Specifically prohibited for use for punitive purposes or matters of liability, litigation, or competition.