Flightfax
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Ground Taxi Mishaps Trends

Have you ever seen a turning main rotor system strike an object? Or maybe it was a tail rotor, or even a propeller. Regardless, the results are about what you'd expect — not good. In fiscal year (FY) 2018 alone there were four Class A mishaps that occurred in the ground taxi regime. Add to that two Class B mishaps and one Class C for a total of seven last year. The following is a quick review of recent mishaps:

1. Class A: CH-47F with an estimated cost of damage (ECOD) of $4.6 million. The crew was ground taxiing at a civilian airport within 75 feet of an obstruction on an unfamiliar airfield without utilizing either a taxi director or blade watchers. As the PC executed a left turn, three aft rotor blades made contact with the corner of a hangar, resulting in damage to the rotor blades, two hangars and two aircraft inside a hangar.

2. Class A: AH-64D with an ECOD a minimum of $2 million. The crew was ground taxiing to parking at night when the main rotor blades made contact with a concrete guard tower.

3. Class A: UH-60L with an ECOD a minimum of $2 million. While ground taxing a UH-60L during night conditions to refuel at a fixed base operator's (FBO) parking area on a commercial airfield parking ramp, the aircraft's main rotor system contacted the control tower building. The crew failed to ensure the aircraft was clear of all obstacles due to overconfidence in the ground guide's ability to assist in clearing the aircraft. They also failed to fully recognize the risk associated with ground taxiing too close to an obstacle (tower) and accurately assess the closure rate of the aircraft's main rotor system to the tower. Additionally, there were distractions when crewmembers began focusing on aircraft shutdown procedures and having the crew chief's inertial reel lock while attempting to clear the tail.

4. Class A: Two CH-47F with an ECOD a minimum of $2 million. The aircraft were ground taxiing for refueling at the FARP under night conditions when Chalk 1 was struck from the rear by Chalk 2's forward rotor blades.

5. Class B: HH-60M with an ECOD a minimum of $500,000. The aircraft was being ground-taxied for refuel-parking when its main rotor system made contact with the vertical fin and rear position light of a parked AH-64D.

6. Class B: HH-60M with an ECOD to be determined. The crew was reportedly in the process of positioning the aircraft for cold refuel at a commercial airport when it made contact with a light pole in the vicinity of the pump.

7. Class C: UH-60M with an ECOD a minimum of $50,000. Two aircraft landed and were parking side by side at a municipal airport for cold refuel

when their blades touched during engine shutdown. Damage was assessed to one aircraft's three main rotor blade tip caps.

Alarming as these numbers may be, there was an equal number (seven) of Class A-C incidents in FY17, with more scattered throughout earlier timeframes. So this is not just a one-time bump in incidents, but a rise in a trend that must be corrected now. A common aviation adage refers to the notion that the difference between minor mishaps (near misses) is measured in inches or split seconds. This definitely applies to object strikes associated with taxi incidents. If there are actual strikes now, how many "close calls" are not reported but still demonstrate the same errors of an actual mishap?

Ground taxi mishaps are almost always associated with human error cause factors and, most importantly, are preventable. Actually they are easily preventable. When taxiing, whether the aircraft is a two-pilot Apache or requires a crew of five, the requirements are the same: maintain aircraft clearance. Basic flight skills involved in taxiing generally do not involve significant conscious thought in completing the task which may lead to attention failures such as failing to properly scan or fixating on accomplishing a secondary task. Conducting these mundane-type maneuvers can lead to complacency or overconfidence in operating the aircraft in what may be considered a low-risk or risk-free environment.

Following the yellow line at a familiar airfield requires minimal effort in maintaining aircraft clearance and surveillance. But what happens when the environment is not so user-friendly, such as operating at an unfamiliar airport or in limited visibility due to obscurants or lack of illumination? Maybe the taxiway is not marked or the taxi involves scooting across a large, open parking ramp with no markings. It could be maneuvering into refueling areas with parking pads not designed for larger aircraft or type of aircraft (e.g., pads designed for fixed-wing clearance). What about light poles that are easily detectable during daylight conditions but seem to disappear with the sunlight? Throw in an FBO parking attendant who is pointing where to park but not how to get there and you have a recipe for a ground taxi mishap. These and other factors can greatly increase the risk with the simple task of driving an aircraft to parking. Add field site conditions with low illumination, dust and wind combinations and you may actually be at the highest risk of your flight.

When a crewmember verbalizes a "clear left" after scanning the sector, a pilot on the controls is confident the maneuver will be accomplished successfully. When the same verbalized clearance call is received by the pilot operating in a space-constrained (tight) area, the confidence level of that clearance needs additional reinforcement. How much clearance is there? Is it the forward or the rear rotor that has been cleared? Main or tail? If statements such as, "It's going to be close," or, "I think we're clear," or, "We should be clear," arise, then confidence in maintaining the required standards comes into doubt. Communicate what clearance is needed and what must be accomplished to attain it. Include options that if safe clearances cannot be maintained, then select an alternate course of action.

Probably the most important mindset when operating an aircraft is to FLY THE AIRCRAFT FROM ENGINE START TO SHUTDOWN. Any time a rotor or prop is in motion, the risk has increased and crew vigilance must be maintained. It isn't just taxiing and flying. It includes monitoring flight controls and scanning for hazards when personnel are moving in and around the aircraft, such as in hot refuel or loading and unloading passengers.

Currently, there are no plans for installation of 30-foot "curb feelers" or a ground object proximity warning audio or camera (found on many new automobiles). So avoiding those hazards encountered during ground operations is a crew's responsibility, requiring proper risk avoidance measures (ground guides, crew coordination and not taking chances). Remember, after touching down following that long mission or flight, you're not done "flying" until the aircraft is in its parking spot and the blades have come to a stop. ■

Jon Dickinson
Aviation Division

Flight Crew Leadership Part IV

Actions of Capable Leaders

In many ways, the pilot-in-command (PIC) of an aircraft, whether called a "captain" in civilian aviation or an "aircraft commander" in military aviation, is the chief executive officer (CEO) of the aircraft. Just as a CEO is responsible for the well-being of employees, satisfaction of customers, financial health of a company, and ethical decision-making, so too is the PIC responsible for all that regarding a given flight when he or she is in command. Passengers, cargo customers, cabin crewmembers, and other pilots on the crew all view the PIC as essentially performing the same duties as a CEO.

For example, if a cabin crewmember spills a drink on a passenger and the passenger complains to the captain after the flight, it would be inexcusable for the captain to stare back at the complaining passenger and say, "*Why are you talking to me? I just work here.*" **In the eyes of the irate passenger, the captain is the senior representative of the company at that moment and should take responsibility for what has happened.** Some companies go so far as to dictate just what a captain has authority to do to compensate passengers for inconveniences in such circumstances.

Although it used to be a somewhat common occurrence, the grueling financial pressures of airline operations today often curtail the captain from responding to passenger inconveniences and minor problems by offering free drinks, frequent flyer miles, or complementary upgrades. It is amazing how much goodwill such treatment by the captain can generate in an otherwise volatile circumstance where passengers perceive the company has let them down.

The following section contains a list of what this author believes are **the top 10 actions exhibited by capable leaders** in any industry, and has a direct bearing on aircraft captains. Although adjustments may have to be made to any list of actions by capable leaders in order to deal with particular circumstances, the list is a useful guide for actions that have a history of proving useful for leading flight crews.

Leader Action # 1 – Set the Stage for Excellence

When the captain first meets the crew, he or she is meeting a group of individuals who may not be performing as a team. There is a difference between a group and a team. As the crew is meeting each other and preparing to perform their assigned duties, they are relying on the individual contributions of each member for performance and may lack a sense of mutual accountability.

Transitioning to a team mindset of shared accountability may require a leap of faith on behalf of some crewmembers. An effective captain can commence the process of team-building by explaining the challenges that will likely be faced during the flight and by depicting how open communication and shared input into the decision-making process can overcome those obstacles.

Captains must recognize the importance of first impressions. **The first few minutes when a captain meets his or her crew are paramount for setting the proper tone for the flight.** It may come as a

surprise to the reader that the teamwork exhibited during a flight is directly related to the captain's actions during those first few moments. However, research has shown that the actions performed by a captain during those first few minutes of his or her leadership when meeting a crew is an accurate predictor of overall crew performance later during the flight.[19]

One should not imply that the captain's actions during the initial meeting magically transform the crew into a team, but that the behavior exhibited by a captain at that time will undoubtedly continue to be performed throughout the crew's trip; thus continuously reinforcing the shared accountability mindset of the crew during the different legs of the trip.

Forging a team out of a crew is directly related to the type of work climate the captain creates. It is the responsibility of any leader to be aware of what the work climate is for her or his employees and to actively work towards creating a pleasant work climate. In such climates, people are more willing to volunteer information and contribute to the overall work processes. Specifically, comfortable work climates are conducive to crewmembers being able to predict the needs of each other and to them taking the initiative to coordinate actions when they perceive that there may be a need for such coordination.[20]

One critical method for encouraging mutual accountability is for the captain to exhibit humility. Some captains actually see their role, and the role of any leader, as that of serving the subordinates. Such a concept of "servant leadership" is actually several thousand years old with its roots in Chinese and Indian philosophies and center on the principle of taking care of a task by looking after the welfare of those who work on the task. The concept is sometimes heard expressed as, *"Take care of your people and your people will take care of the customer."* From a teambuilding perspective, captains who adopt a servant leadership mindset also must display humility by quickly taking responsibility for failures of the crew.

Part of being a humble captain is recognizing the very human tendency to err and openly acknowledging our own personal vulnerability to error so as to encourage the free-flow of crew communication to catch and correct such errors. Unfortunately, it is a common tendency among weaker captains to view any display of vulnerability as a threat to his or her authority. Such captains can fall into the trap of developing a "blame redirection" reflex, which of course is completely contrary to team-building.

One captain this author has met makes it a point to continuously remind himself of the need for humility by placing a quote from Captain Edward Smith prominently in a binder that he frequently references during flight. Edward Smith was the Captain of Titanic when it sunk in 1912. The quote came from five years before the Titanic sunk, which makes the quote a true testament to the power of complacency:

> *When anyone asks how I can best describe my experience in nearly 40 years at sea, I merely say, uneventful. Of course there have been winter gales, and storms and fog the like, but in all my experience, I have never been in any accident of any sort worth speaking about I never saw a wreck and never have been wrecked, nor was I ever in any predicament that threatened to end in disaster of any sort. I cannot imagine any condition which would cause a ship to founder. I cannot conceive of any vital disaster happening to this vessel. Modern ship building has gone beyond that.*

A key way to create a pleasant working environment that fosters free communication and coordination initiative is to **create a climate of mutual respect among the crew.** Such a climate can be established when the captain introduces her or himself to the crew. In many Western cultures, a firm handshake and positive eye contact show a sincere desire to meet a person. By asking how each crewmember is doing and inquiring about their

background, respect and interest can be shown.

However, respect can only be shown in credible fashion if the captain actually listens to what the crewmembers are saying during the introduction. A concerted effort must be made to remember each crewmember's name. Each crewmember should be made to feel valued and a statement should be made by the captain which solicits and respects input from crewmembers during the initial meeting.

The German poet and renaissance man, Johann Wolfgang von Goethe (1749-1832) once wrote, *"If you treat an individual as he is, he will stay as he is, but if you treat him as if he were what he ought to be and could be, then he will become what he ought to be and what he could be."* Such a philosophy can be used to establish a climate of respect among the crew in order to foster team-building. Captains should consider treating new subordinates as though they are dealing with efficient and highly professional coworkers. However, such an approach must be backed-up through supervision and may have to be altered if a deficiency is noted in the subordinate's performance.

During the first meeting with the crew, captains often elect to perform **the first and possibly most important of all briefings: the CRM Briefing. This briefing sets the tone for the flight, asserts the captain's authority, and opens the lines of communication for all other briefings and crew coordination activities.** An old aviation saying about captains who skip this briefing states that, *"By not setting the tone, you have set the tone."* That is why this key event can aptly be termed the "CRM Briefing."

The CRM Briefing should take place at the start of every day or whenever new crewmembers join the flight and can be accomplished at any time prior to commencing crew duties. It should be briefed by the captain and should strive to cover the briefing items that are general to the flight or series of flights that the crew is scheduled to fly. The briefing should cover performance expectations, preview expected challenges, and set realistic goals for individual crewmembers, for the captain, and for the crew as a whole.

It should be noted that some training providers never mention the need for a specific CRM Briefing, focusing exclusively on technical briefings that occur prior to takeoff, approach, or during emergencies. Many captains prefer different means of "setting the tone" prior to a flight and may not perform a formal CRM Briefing. Since the CRM Briefing is primarily focused on promoting crewmember assertiveness by encouraging communication, at the very least, such a briefing should consist of a sincere and explicit expression of the captain's desire for crewmembers to communicate anything unusual or uncomfortable situations.

One useful statement that can be made by captains during the CRM Briefing is, *"I fly by the book. If I deviate from SOPs it isn't intentional…let me know."* Others may state, *"We have a social contract to communicate with each other immediately if anything makes us uncomfortable. Do you agree to this contract?"* CRM Briefings can be extensive, serving as a reminder of key SOP coordination items during possible emergencies and reminding crewmembers that adherence to the Sterile Cockpit Rule should not impede safety-related communication.

The captain may use the CRM Briefing to remind cockpit crewmembers of the need to always have a pilot dedicated to fly the aircraft, especially during emergencies. If a special problem-solving model will be used during the flight, the model can be briefed at this time.

Other possible items for the briefing include **a quick run-through of recent system problems** being encountered in the fleet, recent safety-alert messages concerning operational practices (such as messages from flight operations quality assurance programs and aviation safety action programs), and coordination items regarding engine problems, bird strikes, wind shear encounters, or EGPWS alerts.

The CRM Briefing may also include specific **"protected vocabulary,"** which are special action terms that command an immediate course of action. Examples of protected vocabulary may be terms such as, *"Go Around," "Abort," "Time-out,"* (cease and reassess), *"I am concerned,"* and in military flying terms such as *"Bailout"* (eject), *"Green Light"* (commence air-drop), *"Cleared hot"* (permission to employ weapons), *"Repeat"* (fire again on target), and *"Knock-it-Off"* (cease and reassess). Such terms should be protected at all times, meaning that they should not be used during normal situations, since using the term implies immediate action. For example, a captain may brief rejected takeoff procedures by using the term "reject" while leaving the term "abort" protected for use exclusively to initiate the rejected takeoff procedure.

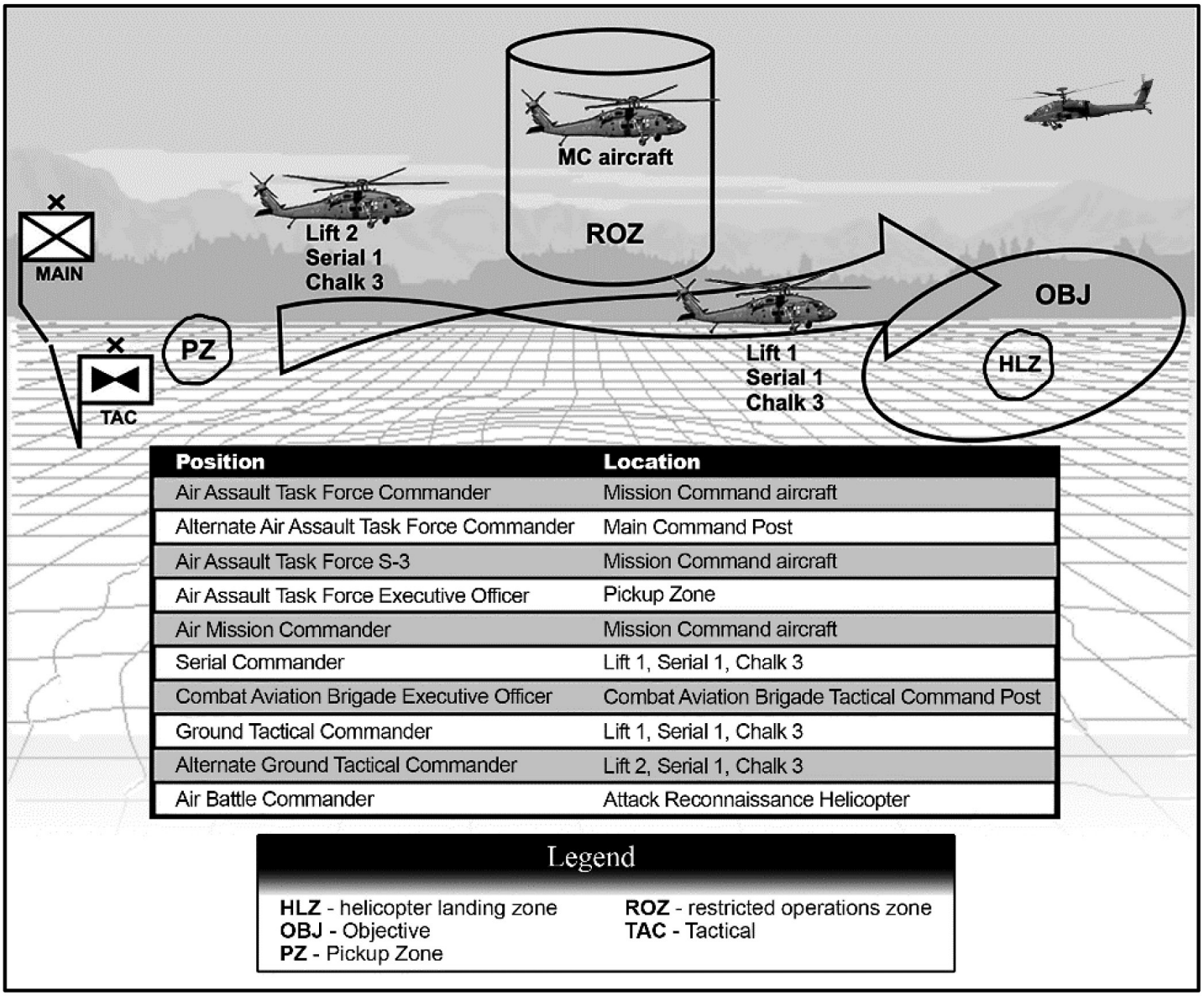
A short CRM Briefing only requires about 10 seconds of time and a more elaborate CRM Briefing

may take a few minutes. When is a busy captain going to find a few minutes to perform the briefing? For those operations where time is allotted for formal pre-briefings, such as is found in military flying, airline functional check flights, light aircraft instructional flights, and check rides, an opportunity for a CRM Briefing is readily found.

During other operations that often lack a structured time for pre-briefing, such as when a captain meets a new crew in the middle of an airline trip, the briefing can occur as the crew rides the hotel bus to the airport, or as the crew walks across the ramp to the aircraft, or while waiting for a gate agent to unlock an access door, or as soon as the crew is aboard the aircraft but prior to passenger boarding or cargo loading. Regardless of where and when the CRM Briefing is conducted, captains should **ensure that the other crewmembers can pay attention to what is being said and should not rush the briefing, since an unhurried briefing sets the tone as much as what is actually being said during the briefing.**

A formal and lengthy CRM Briefing may not be practical when dealing with some support personnel. For example, a captain's attempt to deliver a formal CRM Briefing to a ramp agent who is servicing the aircraft will not be pleasantly received and may in fact set a tone of arrogance when just the opposite tone is desired. At the very least, however, the captain can convey to key support personnel a willingness to receive opinions and to answer questions.

For example, the proper tone can be set prior to deicing and anti-icing an aircraft by having the captain approach a deicing agent with a smile and quickly stating, *"Thanks for helping us out…please*



Position	Location
Air Assault Task Force Commander	Mission Command aircraft
Alternate Air Assault Task Force Commander	Main Command Post
Air Assault Task Force S-3	Mission Command aircraft
Air Assault Task Force Executive Officer	Pickup Zone
Air Mission Commander	Mission Command aircraft
Serial Commander	Lift 1, Serial 1, Chalk 3
Combat Aviation Brigade Executive Officer	Combat Aviation Brigade Tactical Command Post
Ground Tactical Commander	Lift 1, Serial 1, Chalk 3
Alternate Ground Tactical Commander	Lift 2, Serial 1, Chalk 3
Air Battle Commander	Attack Reconnaissance Helicopter

Example disposition of the AATF key leadership

don't hesitate to ask me if you have any questions or comments." Such a quick invitation to communicate may make the difference between the deicing agent voicing a concern or a question about something he or she notices on your aircraft or keeping silent about the item. Remember **that by not actively setting a tone prior to an operation, a tone of indifference may be set by default.**

The critical nature of tone-setting comes through loud-and-clear in the words of 2nd Lieutenant Steve Maro of the U.S. Marine Corps, regarding a key leadership moment he had in 2008:

> *I think specifically the one factor I recall the most regarding leadership at the Marine Corps' Basic School is setting that tone of an open and welcome atmosphere and appearing calm in all situations. I remember during a combat drill we had, I was in a squad with a sergeant in charge. We had to complete a variety of tasks and upon a failure, or if the instructor deemed we weren't up to a specific standard, we'd have to start over.*
>
> *The sergeant's tone was very excited with a raised pitch that allowed for frustrations among the group. I remember finally stopping the group after the 4th failure and told the sergeant to relax and everybody to relax in a calm voice and figure out a plan before making the 5th attempt, and stressed that it was important for everybody to be relaxed. Soon after that I saw our success rate increase, team work increase, and I got called "sir" a lot more (ha ha).*
>
> *People criticize John Stevens, head coach of the Philadelphia Flyers, for being an extremely calm person behind the bench. After the quarterfinals loss in the playoffs, some said Coach Stevens should be more active back there. He too responded with "A nervous coach makes for a nervous captain which makes for a nervous team".*
>
> *Most people I imagine cannot appreciate this unless they've been in similar situations.*

Captains can also set the tone for crew work by projecting enthusiasm for the flight that lies ahead and by explaining that the flight will be run in strict accordance with SOPs. Many captains invite participation in the decision-making process of the flight at this point by stating that they encourage input from the crew. Lines of communication can further be opened when a captain states that he or she also makes mistakes.

Now that the importance of the captain's first meeting with the crew has been stressed, it must be re- emphasized that actually having such a meeting and pursuing related team-building activities can sometimes prove challenging. Military flights have formal briefing times that mandate such meetings. Corporate crews sometimes operate as a single entity for days at a time. However, the airline industry often experiences operations where crewmembers join and leave a crew several times during a trip and even in a single day's worth of flying. Such a scheduling practice can make the team-building task of a captain seem impossible. For example, often cabin crewmembers report directly to the aircraft from home when called on reserve duty and may be replaced or augmented on very short notice.

In fact, in some rare cases captains may meet some of the cabin crewmembers for the first time after a flight, particularly on large aircraft that have half a dozen or more cabin crewmembers. Such a situation is frowned upon, particularly given the emphasis of the Transportation Security Administration in the U.S. on captain accountability for crewmember identification, but such situations still happen. Because of such difficulties, some captains resort to performing a CRM briefing over the public address system on the aircraft after all the crew is onboard but before the passengers start to arrive. Such a workaround is far from optimal since the cabin crew will most likely be listening to the briefing while distracted with other duties, but it is better than nothing and can be a last-ditch technique employed in the frenetic and fluid pace of some airline operations.

[19] *Kern, T. (1998). Flight discipline. New York: McGraw-Hill.*

[20] *Argyle, M. (1991). Cooperation: The basis of sociability. New York: Routledge.*

Cortes

Mishap Review: AH-64 Main Rotor System Failure

While the aircrew was conducting day readiness level (RL) progression at 718 feet above ground level and 129 knots true airspeed in straight and level flight, the AH-64D strap pack assembly laminates failed in fatigue, leading to tensile overload and separation of the Number 2 main rotor blade. The mishap sequence was initiated previous to the flight by a Number 2 outboard strap pack bolt retainer nut fracture due to stress corrosion cracking which reduced the clamp load of the outboard strap pack bolt. This caused the aircraft to depart controlled flight resulting in a catastrophic and fatal crash.

History of Flight

The mishap aircrew took off from their home airfield and conducted 1.4 hours of traffic pattern work executing basic series tasks associated with RL progression. The mishap aircraft departed the airfield traffic pattern using a standard corridor and then transitioned to the north checkpoint en route to the local training area. The aircraft encountered a condition that led to mast separation from the mast base resulting in a departure from controlled flight and subsequent crash. The aircraft crashed resulting in two aircrew fatalities and total loss of the aircraft.

Crewmember Experience

The PC was an instructor pilot and maintenance examiner with 2,477.8 hours in MTDS and 2,616.7 hours total time. The pilot (CPG) had 86.1 hours in MTDS and 170.2 hours total time.

Commentary

Materiel failures while in flight can have catastrophic results as this mishap shows. Maintenance test pilots, instructor pilots, aviators, aircraft maintainers, and technical inspectors should be vigilant in ensuring that the proper procedures are used during inspections and during preflight. As aviation unit personnel, it's up to you to use your experience and training to also think outside the box. Within the specialties of aviators and maintainers, the ability to question something not looking right or a procedure that doesn't seem to fully determine if a flight critical part is "yellow tag" or serviceable materiel, then take action and inform your commander. ■

Class A - C Mishap Tables

	Manned Aircraft Class A – C Mishap Table									as of 26 Sep 18
	Month	FY 17					FY 18			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities
1st Qtr	October	0	0	7	0		1	2	7	0
	November	1	0	4	0		0	1	3	0
	December	1	0	4	2		1	0	7	0
2nd Qtr	January	1	0	3	0		1	1	3	2
	February	0	1	4	0		0	0	1	0
	March	0	1	6	0		0	1	11	0
3rd Qtr	April	1	0	6	1		1	2	4	2
	May	1	0	7	0		1	0	5	0
	June	0	2	5	0		1	1	5	0
4th Qtr	July	0	1	8	0		1	0	6	0
	August	3	3	4	6		3	1	4	1
	September	1	1	7	1		1	1	4	1
	Total for Year	9	9	65	10	Year to Date	11	10	60	6
	Class A Flight Accident rate per 100,000 Flight Hours									
	5 Yr Avg: 1.14		3 Yr Avg: 1.09			FY 17: 0.99			Current FY: 1.30	

UAS Class A – C Mishap Table									as of 26 Sep 18
	FY 17					FY 18			
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total
MQ-1	10	2	4	16	W/GE	3	1	3	7
MQ-5	5	0	1	6	Hunter	1	0	0	1
RQ-7	0	18	39	57	Shadow	0	7	18	25
RQ-11	0	0	1	1	Raven	0	0	0	0
RQ-20	0	0	0	0	Puma	0	0	0	0
SUAV	0	0	0	0	SUAV	0	0	0	0
UAS	15	20	45	80	UAS	4	8	21	33
Aerostat	6	0	1	7	Aerostat	4	2	1	7
Total for Year	21	20	46	87	Year to Date	8	10	22	40

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

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The Danger of the Assumption

A recent accident investigated by the U.S. Army Safety Center highlights the consequences of making assumptions about airfield operations and about crew coordination. The following example shows how easily things can go wrong and end up in disaster.

Background

The accident in question involved two MH-47E aircraft at the airfield hot refuel facility. The facility, a four- point forward area refueling equipment system fed by a series of fuel bladders, had been moved to its current location in September 2002 from another location on the airfield. The personnel who initially set up the facility had rotated back to their home stations. The units currently at the airfield assumed that because this was the airfield refuel facility, it had been properly laid out and surveys done to identify the hazards. They also assumed that the personnel running the refuel facility had been properly trained and had procedures for sequencing aircraft through the facility. The reality was quite different.

While the distance between the refueling points was adequate, not having a site survey for the hazards at the location resulted in no one being responsible for the refuel operation. More to the point, no one was aware that there wasn't enough lateral clearance for an H-47 to taxi clear of refuel points. Because there weren't any written procedures on sequencing aircraft into the facility, the soldier on the radio determined which point he wanted the aircraft to occupy. In addition, because there were no ground markings at the refuel points showing where an aircraft should stop, over time the refueling point could migrate several feet from its optimum location.

During refuel operations, the aircraft at Point Two was actively engaged in hot refuel operations when the second aircraft called ground control for refuel instructions. After calling the refuel facility over the radio, ground control cleared the second H-47 to Point Three. The pilot in command (PC) of the aircraft at Point Two then requested that the aircraft be cleared to Point Four so that when finished, he could depart without interfering with the second aircraft. This change was approved and the second aircraft attempted to ground taxi to Point Four.

The PC in the right seat cleared the aircraft on his side, as did crewmembers along the right side of the aircraft. The result was that the aft rotor system of the taxiing aircraft collided with the forward and aft rotor systems of the aircraft at Point Two. Nine rotor blades and three rotor heads were damaged. Both aircraft were shut down without additional damage. Fortunately, there were no injuries.

Mission: Refuel Operations	HAZARDS	CONTROLS
	Breakdown in crew coordination Inadequate training of refuelers No site survey for facility Chronic fatigue	Recurring crew coordination training Implement risk management techniques Reevaluate current facility procedures and implement training for refuel personnel

In addition, the soldiers operating the refuel facility were from three different CONUS installations. While they had a strong background in bulk refuel, there was no SOP and the soldiers had only minimal training on aircraft refueling operations. Also, they were not familiar with the use of the fire extinguishers present.

Lessons learned

Rotational units deployed to an airfield are essentially tenant organizations, and that includes some inherent responsibilities. When a headquarters establishes or takes over an airfield, people need only look at their home station airfield to see what basic functions and requirements must be accomplished at their deployment airfield.

One of these critical functions is airfield operations, and two key positions—the airfield manager and airfield aviation safety officer (ASO)—must be filled. It is critical that personnel in these positions be deployed early in the airflow to ensure the smooth and safe operation of the airfield.

There was no airfield ASO at the time of the accident. During a joint operation, each service must clearly understand the responsibilities of the other services. All aviation organizations must be involved in the airfield operating board and in the monthly safety and standards councils. Procedures covering all aviation- related operations must be established, published, and widely disseminated.

Crew coordination must be done to standard and all crewmembers are responsible for aircraft clearance. If a crewmember sees a dangerous situation developing, that crewmember must speak up immediately and not assume that the pilots are aware of the situation.

Finally, unit ASOs need to periodically get out and "walk the ground" both at their home station and when deployed. Getting out of the aircraft and periodically meeting those personnel who support your operations is the best way to stay abreast of any changes that may be occurring in your AO. It's also a good way to identify hazards that may exist but have been previously missed. Take nothing for granted, assume nothing, and take immediate action to correct deficiencies.

Aviation Systems and Accident Investigation

Flightfax Forum

Op-ed, Opinions, Ideas, and Information

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

Rotary-Wing Aircraft Fall Protection

Fall protection is an important part of providing a safe working environment for personnel operations at heights. The ability to conduct the work, maintenance operations in the case of Army rotary-wing aircraft, and provide a safety mechanism to prevent and protect from falls is a combat multiplier. While fall protection systems are available commercially and have been fabricated through Army engineering efforts at aviation sites, there still remains issues with meeting the total safety needs in respect to Army aviation rotary-wing aircraft maintenance. This article is intended to bring about discussion on fall protection mitigation in Army rotary aircraft that can be utilized at home station and during deployment.

Fall Protection Assessment

Foremost for a protection system is the assessment. Although service guidelines exist which discuss fall protection and assessing the work place for risk to develop applicable risk mitigation techniques and systems, a standardized Army aviation specific assessment procedure has not been produced.

This should be an assessment which is integrated into the systems safety design process of the aircraft as part of the requirements in Army Regulation (AR) 70-1 as part of the environment, safety, and occupational health program. A planned integration of fall protection into the design and production process for Army airframes would provide the applicable attachment points for fall protection devices across the whole of the airframe. As systems safety is a requirement for Army acquisition, it is incumbent that the fall protection assessment begin at the Program Executive Office for Aviation (PEO-A) level. This would provide cradle to grave risk mitigation.

For the commanders of Army aviation field units, in the interim they should conduct fall protection assessments to manage risk associated with maintenance personnel working above ground level. Utilizing available guidelines for assessing Army rotary-wing aircraft provide the baseline for actually determining what fall protection safety equipment is necessary at differing locations on each of the different mission design series (MDS) aircraft.

Reducing the Risk

Fall risk can be reduced through assessing the hazards to operational personnel conducting maintenance above ground. As commanders and Soldiers know, fall protection is easier to implement in garrison than while deployed. As safety takes a comprehensive approach as part of the Maneuver Support warfighting function, it is important for commanders to take the necessary measures to conserve their maintenance resources while at home station, during training, and while deployed.

A simple fall off the back of a UH-60 auxiliary power unit (APU) area could result in an injury requiring medical treatment and possible disability. For units operating in combat or deployed, this would result in a lost resource and typically in a low density military occupational specialty (MOS) it would be hard to backfill. So as this example illustrates, reducing the fall risk while on aircraft promotes maintaining maximum resources available and minimizes risk to mission and Soldier.

Available Options

Units have available options which they can utilize to meet risk mitigation of falls. Unfortunately there is no "one size fits all" device which will work for all aircraft and at all stations along the airframe. Figures 1- 4 show a few devices currently in use at several Army aviation facilities.

Figure 1 Docking Station

Figure 2 Work Stand

Protecting the Force

Protecting the force provides commanders with the manpower resources necessary to execute high OPTEMPO combat against the threat. We understand as an Army, we have the best training available for military operations. To maintain the standard, we should institute the training and supply the equipment to appropriately

Figure 3 Blade Pin Anchor Point

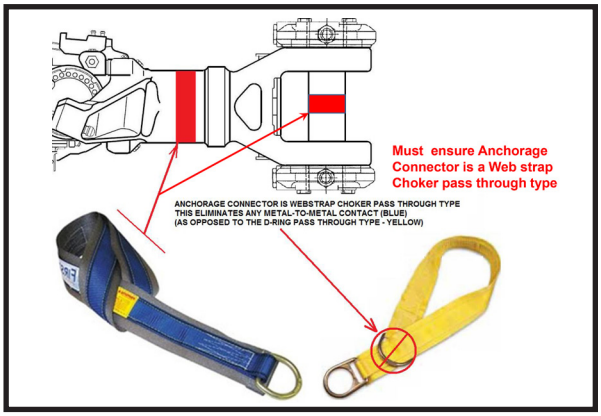

Figure 4 Pitch Housing Anchor Choker Strap

train our personnel to properly utilize fall protection equipment. Within this scope, on the acquisition side, we should integrate fall protection into the systems safety efforts and provide integrated attachment points into Army rotary-wing aircraft which facilitate fall prevention and protection device attachment.

Maximizing the use of this fall protection equipment protects the force:

1. It provides a reduction in loss of resources due to fall injury which maximizes operational capability.
2. Enhances maintainer capability to complete task without injury.
3. Reduces cost due to injury, broken equipment, and disability.

Conclusion

The Army rotary-wing mission provides a tremendous capability to support cross-domain maneuver as part of the combined arms team. Every Soldier in an aviation unit is critically important to mission success. Assessing and mitigating the fall risk while conducting maintenance on Army helicopters should be a primary concern for system safety integrators and field unit commanders. These techniques and procedures should be instituted, trained, and maintained which will protect and maximize mission capability for a ready force.

Jeff Warren
Aviation Tech Writer

Hot Topics - Safety Heads Up!

Fire Containment Kits

Excerpt of FAA National Policy N 8900.430 Reference Fire Containment Kits/Bags Advertised as FAA Certified ⟶ **They Aren't**

"SUBJ: Procedures for fighting In-Flight Fires Associated With Portable Electronic Devices and Lithium Batteries When Using Commercially Marketed Containment Products

Background. A number of manufacturers are marketing **fire containment kits/bags** that may consist of a containment bag, sleeve, or containment box, with or without additional tools such as fire gloves, a pry bar, and face protection/shield. Manufacturers may have stated in their advertisement and marketing videos that their products are "FAA certified" or "successfully tested by the FAA," or that their product "meets FAA standards." However, the Fire Safety Branch (ANG-E21) of the FAA William J. Hughes Technical Center and the Aircraft Certification Service (AIR) emphasize **that there are no FAA test standards for these containment products, nor is there a mechanism in place for the approval of these products."**

TH/OH/UH-72A Emergency Power Supply

The UH-72 has an Emergency Power Supply system which provides power to the Emergency Exit Lighting and the aircraft Standby Horizon. The power for these systems are supplied by the PS-835 emergency battery which is located on the right-hand side of the aircraft behind the sound proofing panel. In the event of a complete electrical failure the two systems will receive power for 30 minutes.

The Emergency Supply System is tested via the "BAT HOR/EXIT" test during the pre-start checks on the aircraft. Once moving the "BAT HOR" switch to the "TEST" position you should see the "EMER BAT" LED turn green on the overhead panel, the "HOR BAT" light illuminate on the CAD and the "EXIT" panels illuminate. This would indicate a properly functioning emergency power supply. If the LED changes from green to red or, turns red immediately during the "TEST", this would indicate the battery has insufficient charge. Ensure you document the discrepancy in the Aircraft Notebook (ACN) and maintainers will trouble shoot the system IAW AMM 34-24-00, 1-1.

The emergency battery receives a charge from the EPU or the aircraft generators. Ensure the "EM/EX" switch is in the "ARM" position to charge the battery while in flight. To prevent the emergency battery from being drained and prolong the life of the battery, Air crew members shall ensure both the "STBY HOR" and "EM/EX" are turned off at the end of the flight and prior to walking away from the aircraft.

Mr. Sean Higgins (S3, Inc.) LHPdO
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Mishap Briefs #69

Cargo Helicopters

CH-47

F Model – Rotor wash from an aircraft repositioning to land following refuel, damaged the adjacent aircraft as its crew was conducting shutdown procedures. (Class C)

F Model – Crew was attempting a confined space landing in an approved LZ, while under NVG, when the aircraft descended into trees with the aft blades. Three aft main rotor blades were damaged. Aircraft landed safely with no injury to crew. (Class C)

Utility Helicopters

UH-60

M-Model – Crew was repositioning aircraft for cold refuel at a civil airport, during which the aircraft made contact with a light pole in the vicinity of the pump. (Class B)

UH-72

A Model – Aircraft main rotor blades made contact with the wire strike protection system (WSPS) during a simulated engine failure landing. (Class C)

Attack Helicopters

AH-64

D Model – Crew experienced a series of vibrations while in level flight at 115 KTAS, 2500 feet MSL and returned aircraft to airfield. Post-flight inspection revealed that an area 20 X 10 inches had separated from the outboard trailing edge of the #4 rotor blade. (Class C)

Unmanned Aircraft

RQ-7

B-Model – System was presumed to have crashed after crew experienced engine failure. Recovery team found location of the UAS and confirmed that it was destroyed. (Class B)

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Flightfax Safety Alert 092618

1. MISSION DESIGN SERIES (MDS) AFFECTED – All Army fixed-wing and rotary-wing aircraft.

2. SUMMARY –

2.1. Background – Trend: Multiple mishaps reported involving ground taxiing aircraft striking objects. During FY18 there have been four Class A mishaps, one Class B and two Class Cs. In FY17 there was one Class A, one Class B and five Class C ground taxi mishaps. From FY13 – FY19, a total of nine Class A mishaps were recorded.

2.2. Message Purpose – Raise awareness of increased risks associated with operations in unfamiliar or restricted operating space, ways to increase vigilance of the aircrews, and proper use of ground guides. Application of countermeasures for aircrews: review aircrew coordination procedures, lessons learned from taxi mishaps, reviewing requirements and standards associated with ground taxiing their aircraft and discuss effects.

3. TECHNICAL PROCEDURES/INSTRUCTIONS –

3.1. Aviation unit commanders or a designated representative should ensure all applicable personnel are briefed on the contents of this message and all applicable actions are completed. Recommend posting to your reading file and bulletin/safety boards.

3.2. Root cause analysis of aircraft ground taxi accidents over the past two (2) years has been identified: **lack of crew focus and poor aircrew coordination.**

3.3. Fleet awareness of this potential hazard will reduce both the probability and severity of the risk. All units shall review their aircraft taxi procedures and ensure proper training is conducted per the aircraft operator's manual, the aircrew training module, and the unit standard operating procedures (SOP).

3.4. Risk management actions should be executed IAW Army Techniques Publication (ATP) 5-19, Risk Management, aviation risk management local policies, and unit SOP. Additional emphasis should be placed on ground taxi operations and obstacle avoidance. Procedures for planning and operating at airfields, field sites, and refuel points shall be reviewed by staff for updated policy and procedures to reduce ground taxi mishap risk.

4. SPECIAL PROVISIONS FOR WHEN GROUND TAXIING –

4.1. Commanders and staffs place special emphasis on safety site surveys prior to operations on civil airports, field sites, and refuel sites to identify and mitigate hazards.

5. MAINTENANCE APPLICATION – N/A.

6. ASSEMBLIES/COMPONENTS/PARTS AFFECTED – N/A.

7**. SPECIAL TOOLS AND FIXTURES REQUIRED** – N/A.

10. SUPPLY/PARTS (REQUISITION/ DISPOSITION) – N/A.

11. COMPLIANCE REPORTING REQUIREMENTS – N/A.

12. PUBLICATION REQUIREMENTS –

12.1. AR 95-1, ATP 5-19, TC 3-04.11, Aircrew Training Module, Aircraft Operator's Manual.

13. POINTS OF CONTACT –

13.1. Aviation safety officer.

UNMANNED ≠ EXPENDABLE

- ✔ Conduct deliberate mission planning and reasses as mission dictates
- ✔ Secure proper mission approval and update as risk elements change

- ✔ Know your equipment
- ✔ Stay in the fight, follow your checklist

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