Flightfax
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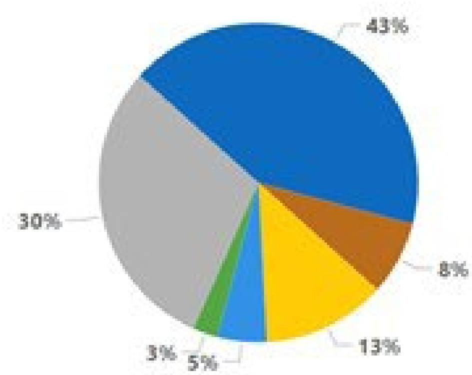
5-year Army Aviation Class A Mishap Review

In fiscal year (FY) 24, Army Aviation experienced 15 Class A flight mishaps and a mishap rate well above the five-year average of 0.85. FY24's manned Class A flight mishap rate was 1.90 per 100,000 flying hours. The last time the mishap rate was above 1.90 was FY08. Based on this, the Directorate of Analysis and Prevention (DAP) Aviation Division at the U.S. Army Combat Readiness Center conducted a five-year review of Army Aviation Class A flight mishap trends. During this five-year period, Army Aviation experienced 49 Class A mishaps comprised of 40 flight, two flight related and seven aviation ground.

Figure 1: Class A Aviation Mishaps FY20-24

Class A Mishaps: 40 Flight, 2 Flight Related, 7 Ground

Aviation Mishaps Account by MDS



MTD	#	Rate
H-60	12	1.23
H-64	17	4.41
H-47	3	1.28
H-72	5	0.99
FW	2	0.67
H-6	1	3.51
Army	40	1.65

49 Mishaps (45 Fatalities)

Event Description	Events	Fatalities
Incorrect EP Actual	2	8
Incorrect EP Training	4	3
CFIT/Object Strike	10	4
DVE Dust/Snow, IIMC	1	3
Hoist	1	1
Dynamic Rollover	4	0
Abrupt Manuevers	2	2
Hard Landing	1	0
External Sling Load	2	0
Maintenance Practices	3	0
Materiel Failure	0	0
Aircraft Ground	7	0
Spatial Disorientation	2	7
Midair Collision	2	12
LTE	6	2
Bird Strike	2	0
TBD	0	0
Non Military- Fatal		3

Mishaps	Army	Flight
Class A	49	40

RA	Flight
36	30

NG	Flight
13	10

RC	Flight
0	0

Location	Mishaps
Training	30
Maintenanc...	3
Service/Su...	9
Danger/Co...	7

Primary Factor	Mishaps	Percent
Human Error	41	82%
Materiel Failure	3	6%
Environmental	5	12%
Total	49	100%

Time of Day	Mishaps
Day	29
Night	4
NVG/NVS	16
Total	49

AREAS TO FOCUS/MITIGATE

- Align Training with Upcoming Missions
- Develop Experience in Power Management, DVE, and Terrain Flight
- Manage 4th quarter turbulence
- Right Mix for the Right Mission
- Select and train mature, effective MBO's based on experience

To better analyze Class A flight mishap trends during this period, DAP-Aviation used FY22, which was the lowest Manned Army Aviation mishap rate in recorded history with a rate of 0.5 per 100,000 flight hours, as the anchor point. As the outlier in mishap rates, FY22 was analyzed separately while the rest of the five-year period was divided into the two years prior and two years after FY22. The two leading mishap events from FY20 to FY24 were incorrect response to an actual/training emergency procedure or a loss of tail rotor effectiveness mishap (see Figure: 1).

For this discussion, we will focus on the Department of Defense Human Factors Taxonomy 8.0, looking at both the unsafe acts (what happened) and the latent failure codes (why it happened). Unsafe acts are the actions committed by an operator or mishap person that results in the execution of a human error or unsafe situation. These unsafe acts are further divided into errors (unintentional deviations from standards) and known deviations (intended and deliberate deviations of standards). Errors are further broken down into "performance or skill-based" errors and "judgement or decision-based" errors (see Figure 2).

Figure 2: Unsafe Act Categories

Unsafe Acts are the ***actions committed by an operator or mishap person that results in the execution of a human error or unsafe situation.*** The actions are closely related or tied directly to the operator or mishap person.

There are two distinct categories of unsafe acts: (1) errors and (2) known deviations.

*The error category includes two subcategories: (1) performance-based errors and (2) judgement or decision-making errors.

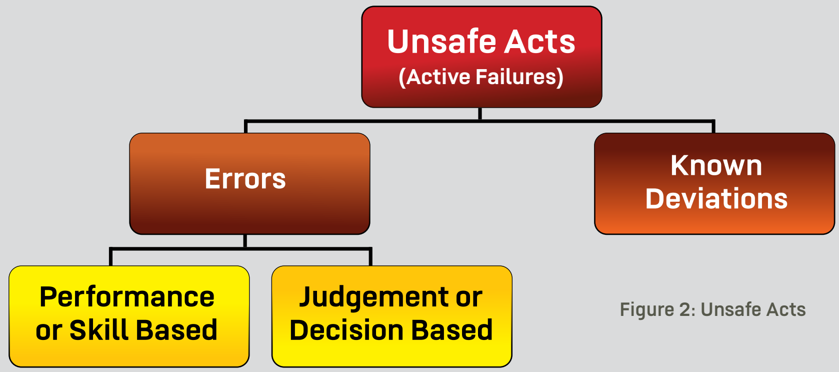
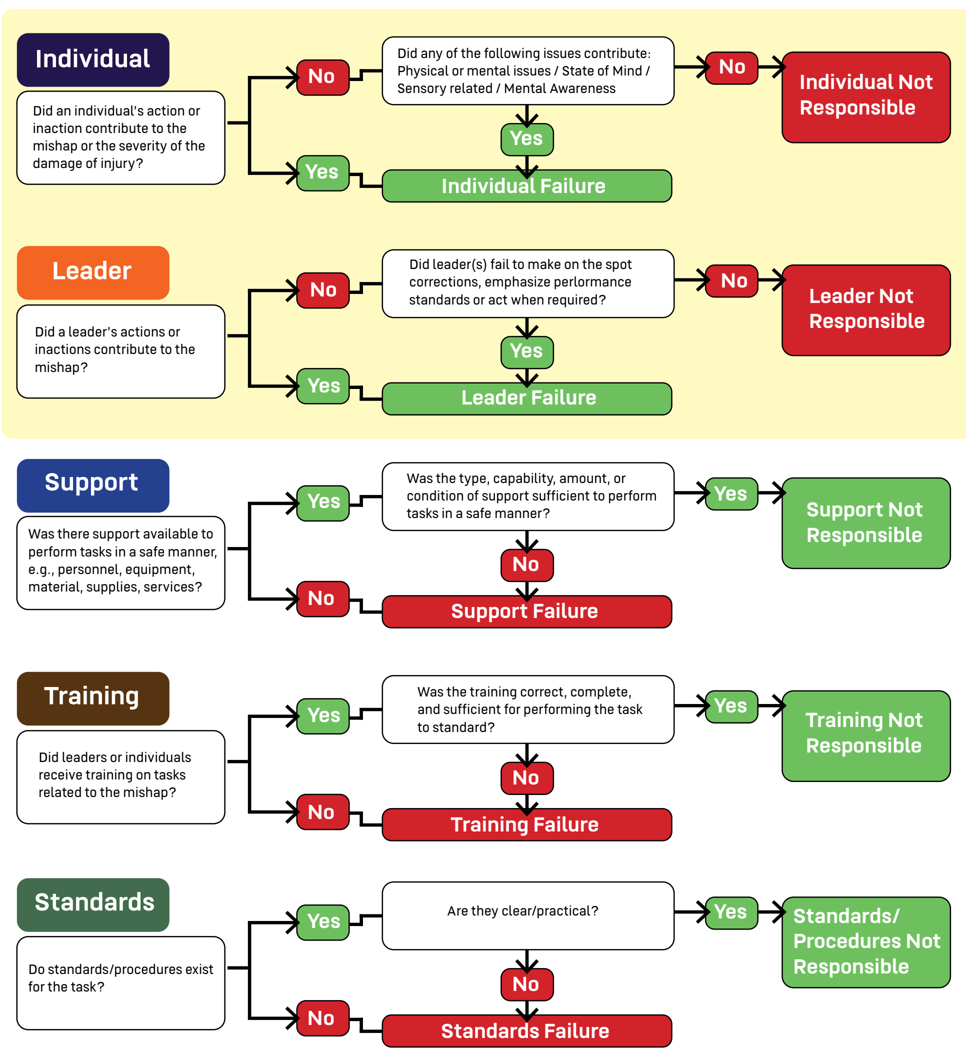


Figure 2: Unsafe Acts

Latent failures or conditions explain why the unsafe act occurred and for every unsafe act there can be multiple latent failures that directly or indirectly influenced the unsafe act to occur. It is helpful to think of latent failures as systematic deficiencies in an organization that circumvent an organization's system of checks and balances (holes in the layers of defense), setting conditions for a mishap to occur. These latent failures are grouped into five groups referred to as System Inadequacies. The five group names for these System Inadequacies are Individual, Leader, Support, Training and Standards (see Figure 3 for a detailed explanation).

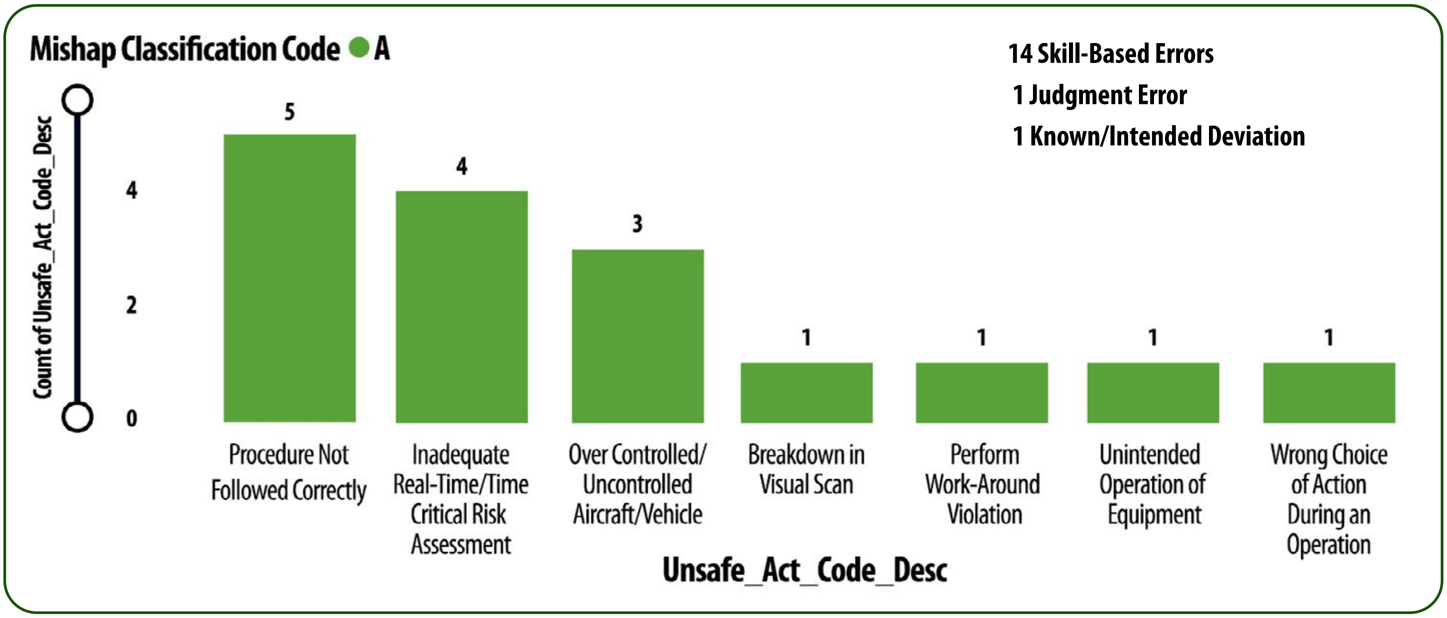
Figure 3: System Inadequacy Categories



Fiscal Years 20-21

In FY20, Army Aviation experienced a Class A mishap rate of 0.63 that was comprised of five mishaps within 789,678 flight hours. FY21 had seven Class A mishaps for a rate of 0.87 with 805,838 flight hours flown.

Figure 4: FY20-21 Unsafe Act Codes



Within these two fiscal years, there were 14 skill-based errors, one judgment error and one known/intended deviation (see Figure 4). The Class A mishaps in FY20-21 had 27 Individual, 14 Leader, four Standards, four Support and three Training Latent Failures (see Figure 5). Put another way, the predominant unsafe acts were unintentional errors (the what) and were caused by Individual and Leader System Inadequacies (the why). To a lesser extent, a lack of support, training and standards contributed to the FY 20-21 mishaps. This is not surprising since it is a Human Factors taxonomy and compels at least one individual system inadequacy per unsafe act.

Fiscal Year 22

The anomaly year, the best recorded in Army Aviation history, had four Class A mishaps for a mishap rate of 0.5 with 803,683 hours flown. In FY22, all the unsafe acts associated with Class A flight mishaps were unintentional errors. Three skill-based errors and one judgment error (see Figure 6). The System Inadequacy categories showed seven Individual and three Leader Latent Failures (see Figure 7). Unintentional errors (the what), along with Individual and Leader System Inadequacies (the why), continued to drive the Class A mishap human errors in FY22.

Fiscal Years 23-24

In FY23, Army Aviation experienced a Class A mishap rate of 1.08 that was comprised of nine mishaps within 835,278 flight hours. FY24 had 15 Class A mishaps for a rate of 1.9 with 790,982 flight hours flown. The unsafe acts during this time were 24 skill-based errors, 12 judgement errors and three known/intended deviations. From these unsafe acts, there is a noticeable increase in skill-based errors (see Figure 8).

The System Inadequacy categories showed 63 Individual, 50 Leader, 16 Standards,16 Support and 18 Training Latent Failures (see Figure 9). There was a proportional increase of individual and training system inadequacies to the increased mishap rate (100% in number of Class A mishaps between FY20-21 and FY23-24). Of note, there was a

Figure 5: FY20-21 System Inadequacies

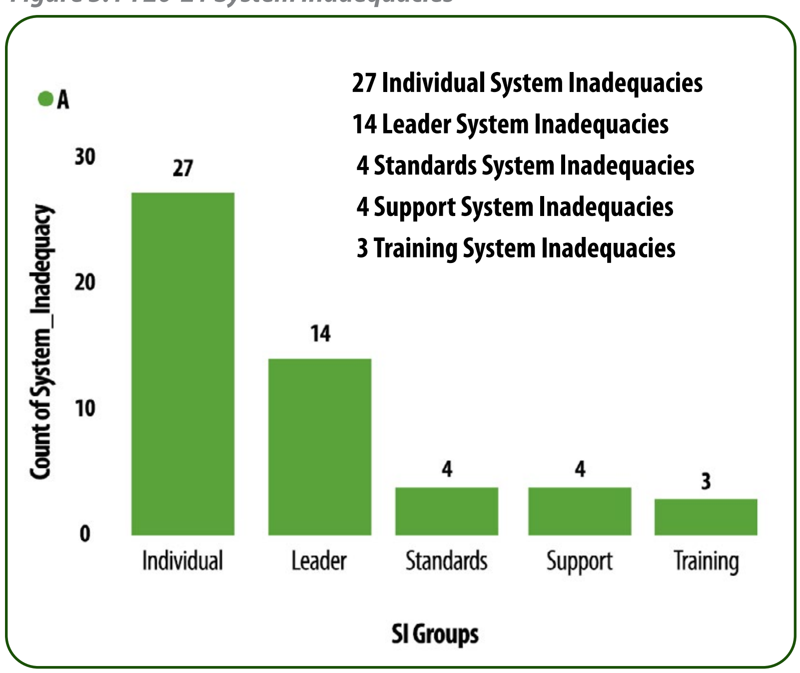
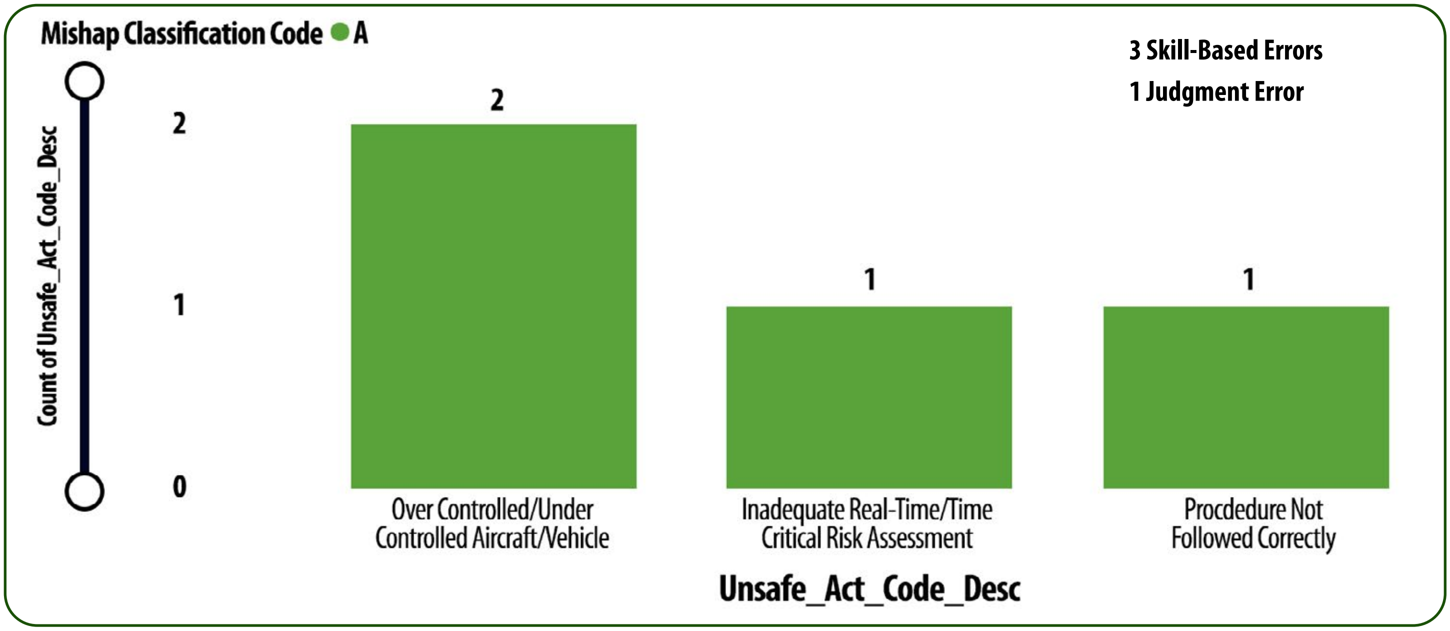


Figure 6: FY22 Unsafe Acts



disproportionally high increase in Leader and Support system inadequacies (see Figure 10).

When taken into context with the increase of unintentional unsafe acts by individuals, the increase of Leader and Training System Inadequacies are indicative of inexperience or inadequately trained Soldiers and leaders, which is consistent with the mid-level experience gap that Army Aviation is currently facing. For the increase in Support and Standards System Inadequacies, I referred to the definition in DOD HFACS 8.0, which states:

"Support System Inadequacies are when insufficient resources are a factor. Specifically, when the type, amount, capabilities, or condition of the support is insufficient to correctly perform

Figure 7: FY20 System Inadequacies

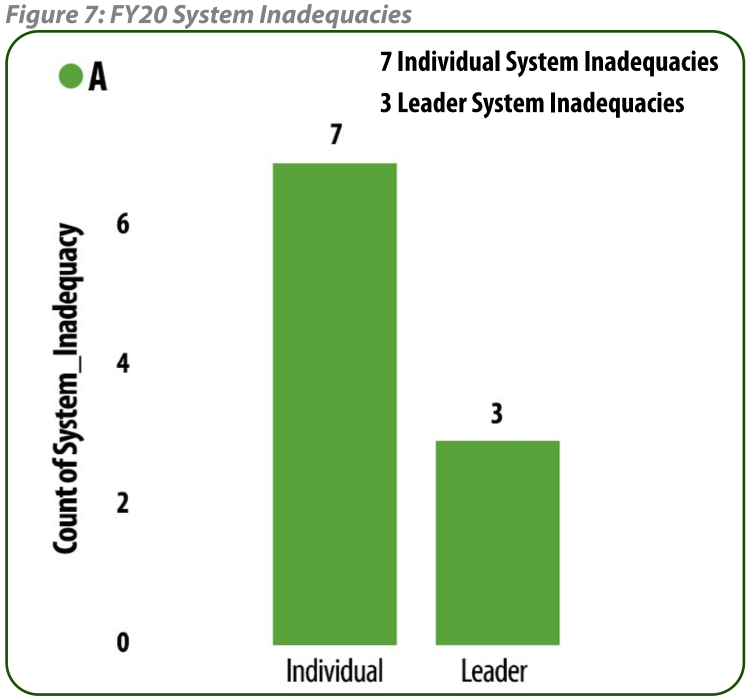
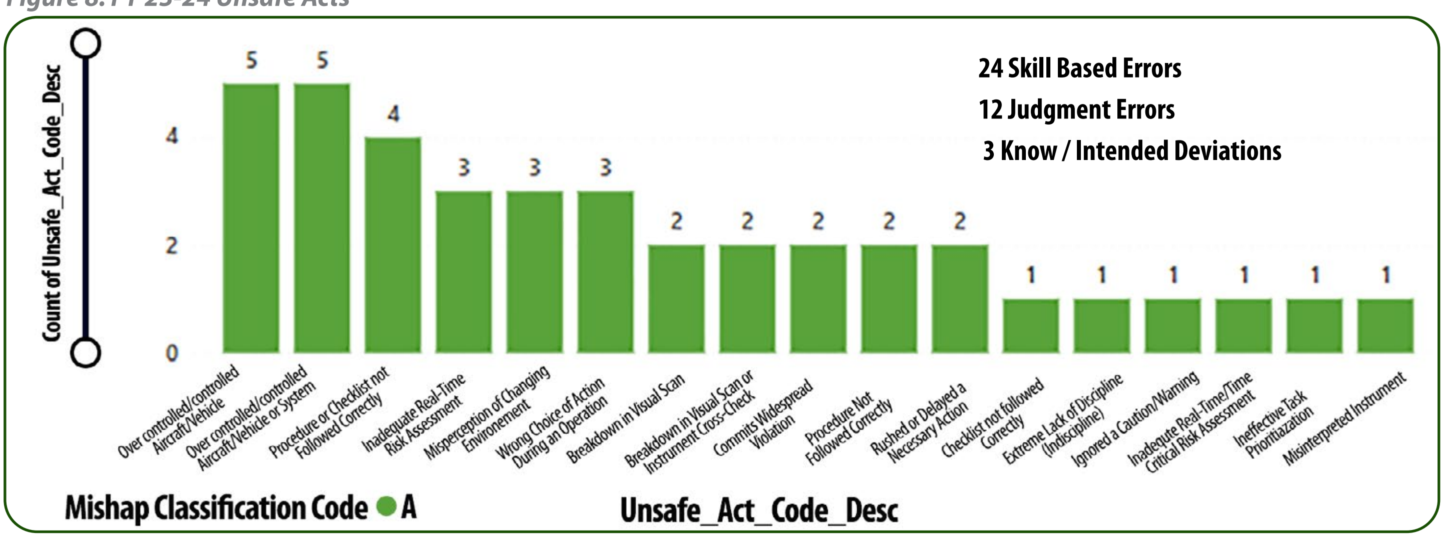


Figure 8: FY 23-24 Unsafe Acts

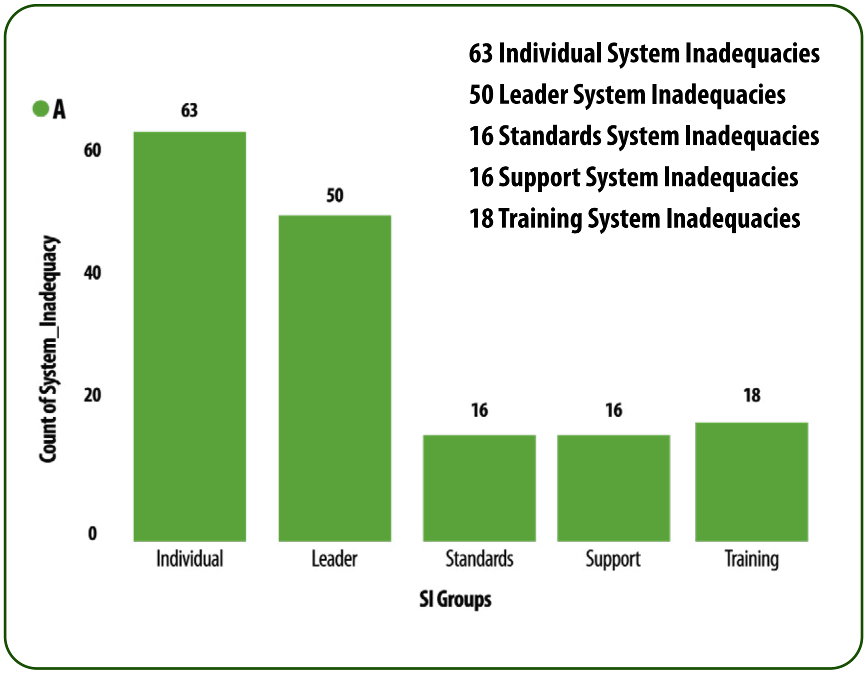


the mission or task. Support includes personnel, equipment, material, supplies, infrastructure services or facilities."

"Standards System Inadequacies exist when [it] is determined standards, regulations, policies, or procedures, were unclear, impractical, inadequate or did not exist."

Taking these two definitions at face value, one can surmise this is also consistent with the mid-level experience gap in both Army Aviation warrant officers and non-commissioned officers who are being asked to perform tasks above their experience and skill level. It also illustrates the importance of written standards and the support structure needed for Soldiers whose fluency of experience requires additional resources for safe execution.

Figure 9: FY 23-24 System Inadequacies Conclusion



So, what can we do about it? Being mission focused with our training plans can go a long way to avoiding unnecessary risks and executing the essential elements of risk management in the Commander's Aircrew Training Program manual by ensuring:

(1) Leader training and certification.

(2) Leader positioning.

(3) Progressive training (crawl, walk, run).

(4) Shared understanding through mission command philosophy (knowing unit/Soldier capabilities).

(5) Rigorous Pilot-in-Command, Flight Lead, and Air Mission Commander programs.

Being focused on these essential elements help mitigate the hazards of distraction (high operations tempo), transitions (leader turnover) and expectation vs. reality (lack of experience). ■

LTC Sean O'Connell
Aviation Division Chief
U.S. Army Combat Readiness Center

Figure 10: System Inadequacy Changes

System Inadequacies	FY 20-21	FY22	FY 23-24	Percent Increase Between FY20-21 and FY 23-24
Individual	27	7	63	133%
Leader	14	3	50	257%
Support	4	0	16	300%
Training	4	0	18	350%
Standards	3	0	16	433%

AH-64: Use of the Force Trim

The AH-64 flight control system is designed to aid pilots in flight and reduce their workloads inside the cockpit. Data from recent Class A accidents and experimental flight testing (AH-64E Unanticipated Yaw Study was published on October 10th by the Aviation Flight Test Directorate at the U.S. Army Test Center, Redstone Arsenal) show pilots are not using the force trim system correctly and do not understand the heading hold mode. If pilots use force trim improperly, they may encounter an unanticipated yaw event or uncommanded flight control input that could result in aircraft damage or personnel injury. Improper use of the flight control system is not necessarily the sole cause of unanticipated yaw events in the AH-64E. However, this article aims to clarify the functions of, and relationship between, the SCAS, SAS, and force trim systems to help pilots maintain aircraft control and reduce the likelihood of unanticipated yaw.

The flight management computer (FMC) applies inputs to the flight controls via the Stability Command Augmentation System (SCAS), providing 10% authority in the collective, roll, and yaw axes and 20% authority in the pitch axis. SCAS enables functions such as hold modes and stability and command augmentation. The pilot interacts with this system via the force trim function, which can interrupt the FMC inputs to the flight controls and center the Stability Augmentation System (SAS) sleeve within the servo-actuator, allowing full SCAS authority.

Through data collection and pilot observation, aviators make significant flight control manipulations without interrupting force trim when maneuvering the aircraft. In addition to the added workload on the pilot due to fighting against the magnetic brakes and feel springs, flying in this manner can cause an unanticipated yaw. While operating the aircraft below 40 KTS, the heading hold is active unless force trim is interrupted. When decelerating from high-speed flight (>40 KTS) to slow-speed flight (<40 KTS)—such as when conducting an approach to an Out-of-Ground Effect (OGE) hover—heading hold becomes active without indication to the crew.

If the pilot does not interrupt force trim and make appropriate pedal inputs to maintain heading, the SAS

can saturate, and the helicopter may no longer be able to maintain its heading without pilot action. In this case, "SAS SATURATED" will not be displayed to the crew for the yaw axis with the Attitude (ATT) or Altitude (ALT) hold modes off, nor will the aural tone be heard. When the SAS saturates, and further yaw SAS input is required to maintain heading, the helicopter will begin to yaw (most likely to the right). If the yaw SAS reaches its limit (in other words, it becomes saturated) while applying power to achieve In-Ground Effect (IGE) or OGE hover power, the right yaw will accelerate as the collective is increased to stop the aircraft from descending. In this case, the pilot must be ready to react and provide pedal input to prevent the yaw; otherwise, it could accelerate to an unrecoverable profile.

That said, the recommended technique for manipulating flight controls is with the force trim release (FTR) switch actioned/pressed. In other words, the pilot should press the FTR, manipulate the controls to their desired position, and then release the FTR switch. FTR manipulation should be a continuous process as the pilot maneuvers the aircraft. This technique has several benefits:

1. The magnetic brakes release when the pilot presses the FTR switch, making it easier for the pilot to manipulate the controls.
2. It allows the SAS to center, giving more authority to the SCAS system (3-5 seconds provides time for the SAS to center).
3. It interrupts the command signal sent to the flight controls from the Flight Management Computer (FMC). Ultimately, this technique helps prevent SAS saturation and reduces the pilot's workload.

Pilots must understand the flight control system, its functions, and how their inputs affect the system. The technique above is preferred, but pilot judgement is also paramount. Some instances may not require utilizing this technique, such as when hold modes are engaged, flying in instrument meteorological conditions, or performing a hovering pedal turn. Pilots must continuously be in control of the aircraft and make the appropriate flight control inputs when required. Over-reliance on the SCAS system and/or hold modes could be dangerous if the pilot does not monitor the aircraft. If pilots encounter an unanticipated yaw, they must make pedal inputs to correct the yaw. If the yaw is out of control, the pilot must use the recovery procedure published in STACOM 24-04. The AH-64E unanticipated yaw study published by the Aviation Flight Test Directorate can be found in the Knowledge Sharing folder of the DES SharePoint *(USAACE Directorate of Evaluation and Standardization - Home)*. ■

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Forum

Op-ed, Opinions, Ideas and Information
(Views expressed are to generate professional discussion and are not U.S. Army or USACRC policy)

The Future Proliferation of Small Unmanned Systems

As the Army moves to modernize and increase lethality and capabilities, one of its major focuses during the next several years will be increasing Small Unmanned Aircraft System (SUAS) capabilities at all echelons, particularly battalion-level and below. Current conflicts and engagements have shown how capable and lethal SUAS can be in the modern fight when injected at those levels. With the increase in capabilities at lower echelons, there are gaps in understanding the control measures and safety considerations necessary for UAS in airspace.

This lack of understanding already existed with previous SUAS and will possibly only widen with the increase in systems. The lack of understanding is particularly persistent in non-aviation units where UAS systems will be used. The question then, is how the military will reduce this risk in the future? How do they develop the knowledge and understanding in units that have no real aviation background or understanding of the ancillary impacts of their systems?

I have personally seen within units a general lack of education and training when using SUAS. Airspace is often not fully understood, restrictive operating zones (ROZ) are undersized for the mission, lack of knowledge of the battle space and a lack of effective immediate communication when needing to perform immediate deconfliction. This is normally an issue when in a complex training environment. This doesn't even include the potential issues on the National Guard side where units need to understand the classes of airspace, the restrictions on SUAS and all the coordination involved when possibly supporting domestic operations.

One of the solutions may already be available to the Army within their current formations. In most brigades in the Army, there exist UAS subject matter experts. These are the 150U UAS warrant officers and15W UAS operators. These UAS SMEs over the last few decades have primarily served as operators for the RQ-7 Shadow UAS. They have not had to deal much with managing or flying the SUAS systems issued to many battalions, but these Soldiers have the most experience and knowledge when it comes to UAS. UAS platoons are knowledgeable in airspace, operations, standards and safety when it concerns operating UAS in airspace.

With the sunsetting of the RQ-11 and RQ-7, now is a perfect opportunity to use this knowledge to develop strong and safe SUAS programs within the formations. Infantry, engineer, military police and other organizations do not receive the level of training and experience that a 150U or 15W can provide. Because of this, they often lack a good understanding of the safety measures and requirements when flying their systems within the airspace. The UAS SMEs can help teach, structure and build these SUAS programs based off the programs they maintained for the legacy airframes. Qualifying the 150U and 15W on these newer SUAS platforms would also help with their understanding of how best to implement and mold these programs. Leadership must buy in on this, though, by providing the time, resources and personnel, so the SUAS programs can be effectively developed. There is inherent risk in pushing the UAS SMEs who are awaiting new platforms out of their discipline


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
U.S. ARMY
U.S. ARMY COMBAT READINESS CENTER
https://safety.army.mil

into non-UAS duties, causing degradation in the knowledge and skills that have been gained over years of experience. Utilizing the existing expertise and knowledge is one of the best courses of actions available.

Manned aviation is encouraged to involve themselves more in the development of these programs since many of these new systems will be competing for the same lower altitudes as rotary wing aircraft. This is why it is imperative that aviation units coordinate with the BCT to help develop these programs and safeguards at the lowest level. The best place for them to do this may be through the Brigade Aviation Elements and 150Us that exist already within the BCT. Aviation units can help provide oversight and evaluation of the standard operating procedures and TTPs.

During this period of transition, leaders can begin creating strong programs of education and training down to the lowest level. By maintaining and applying experience appropriately, the Army can mitigate most future issues while preserving a strong, lethal UAS force. This will not be accomplished without the buy-in of leaders at all levels and for the UAS SMEs within each formation to be proactive in the development of SUAS programs throughout the brigades. ■

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Forum

Op-ed, Opinions, Ideas and Information

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

A recent contributed article to Risk Management digital magazine highlighted a couple of potential issues in our aviation formations: personal electronic devices in the cockpit and aviation crews removing gloves in flight to manipulate Electronic Flight Bags. In the article, a full-sized personal iPad fell off the dash of an Apache and struck the collective head, causing the aircraft to descend into the trees and resulted in Class C damage.

Electronic Flight Bags (EFBs) and Personal Electronic Devices (PEDs) in the aircraft

Electronics that are used in the cockpit must be covered by an air worthiness release (AWR).

WARNING

ELECTRONIC INTERFERENCE (EMI)

No electrical/electronic devices of any sort, other than those described in this manual or appropriate airworthiness release and approved by USAAMCOM AMSRD-AMR-AE-U are to be operated by crewmembers or passengers during operation of this helicopter.

The above warning is from the H-60M operators manual and similar language can be found in all other rotary winged aircraft operators manuals. Each Army MDS that allows EFB use has an AWR that provides operating conditions/restrictions. Specific tablet models are prescribed and required application software is specified. A circled red X status symbol and entry in the aircraft logbook requiring operating within the limitations and restrictions of the AWR is required.

Cellular transmitters are prohibited for inflight use by the Federal Communications Commission (FCC).

Excerpt from Title 47 U.S. Code of Federal Regulations:

22.925 Prohibition on airborne operation of cellular telephones.

Cellular telephones installed in or carried aboard airplanes, balloons or any other type of aircraft must not be operated while such aircraft are airborne (not touching the ground). When any aircraft leaves the ground, all cellular telephones on board that aircraft must be turned off. The following notice must be posted on or near each cellular telephone installed in any aircraft:

“The use of cellular telephones while this aircraft is airborne is prohibited by FCC rules, and the violation of this rule could result in suspension of service and/or a fine. The use of cellular telephones while this aircraft is on the ground is subject to FAA regulations.”

These rules apply to EFBs and to your personal cell phone. Cellular transmission must be inhibited by placing devices in airplane mode or other means.

An additional hazard to consider

An additional consideration when flying with EFBs and PEDs is battery fires. The H-60M operators manual has the following warning that could be applied to any Army aircraft:

WARNING

LITHIUM BATTERIES

Lithium batteries, including but not limited to lithium-ion batteries, utilized in computers and carry-on equipment, may experience thermal runaway, spontaneous ignition or explosion if disassembled, physically damaged, short circuited, overcharged, or exposed to fire or high temperatures. Avoid solar heating of lithium batteries, devices with lithiuk batteries installedf, and do not place near sources of heat. Thermal runaway may produce both flamable vapor and oxygen. In the event of thermal runaway, the carry on/worn equipment containing the battery should be jettisoned from the aircraft immediately. Use of fire extinguisher agent or water may temporarily slow thermal reaction while the quipment is removed from personnel/aircraft. Do not cover or enclose the device in an attempt to smother the fire, as this wil insulate the battery pack and encourage further thermal runaway. A lithium battery fire may be difficult to extinguish and reignition is highly likely. Thermal runaway of batteries in rack-mounted equipment should be treated as an aircraft fire.

Don't fly gloveless

AR 95-1 (Chapter 5-7) requires aviation commanders to establish an EFB program that ensures standardization, device content, accountability, adequate crew training and redundancy in the aircraft if an EFB is used. The pilot in command is responsible for ensuring the crew complies with EFB policies and procedures. The same regulation requires flight gloves to be worn in Chapter 8-8.

Touchscreen Flight Gloves NSNs:

Desert Tan, Type II, Class 2	
NSNs:	Size
8415-01-657-0325	4
8415-01-657-0328	5
8415-01-657-0334	6
8415-01-657-0336	7
8415-01-657-0347	8
8415-01-657-0351	9
8415-01-657-0356	10
8415-01-657-0361	11
8415-01-657-0364	12

Sage Green, Type II, Class 5	
NSNs:	Size
8415-01-657-0520	4
8415-01-657-0533	5
8415-01-657-0534	6
8415-01-657-0535	7
8415-01-657-0536	8
8415-01-657-0539	9
8415-01-657-0545	10
8415-01-657-0549	11
8415-01-657-0552	12

Commanders, provide crews with required gloves for EFB use or require crews to use a stylus. Pilots-in-command, enforce the standard your commander has set. You wouldn't let your pilot fly without his helmet or boots, would you? Pilots-in-command, ensure aircrew and passengers understand the restrictions regarding cellular use in flight and what to do if a lithium-ion battery fire occurs. Consider a no cell phone policy during pre-flight, ground handling and maintenance operations, as well, to reduce the occurrences of our most preventable mishaps. ■

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

FlightFax
REPORT of ARMY AIRCRAFT ACCIDENTS
April 1995 ◆ Vol 23 ◆ No 7

Operating in limited-visibility conditions caused by blowing snow or dust can be challenging, risky, and potentially destructive. In this issue of FlightFax, one commander shares his unit's search for safer brownout/whiteout operating techniques and provides a sample of their new blowing dust/snow SOP in the hope that others may find his unit's experience and new techniques helpful.

Desert operations revisited: a success story

The January 1994 issue of *FlightFax* featured an article entitled "Brownout/Whiteout Prevention Techniques" by LTC William A. Tucker and MAJ Richard Young of the Army Safety Center. As a battalion commander who had suffered one Class C and a few Class D and E accidents and incidents at the National Training Center in August 1993, I had a vested interest in whatever the authors had to say. The desert had not been very good to me, and despite my experiences as a brigade XO during Desert Storm with an accident-free brigade, I needed advice, guidance, and some good ideas.

Tips and techniques provided

The authors offered just that, including some rather obvious points to consider. Reviewing flight manuals and other sources on techniques and tips for brownout conditions is one thing; anticipating and planning for such conditions is another. And we had done all of that prior to our rotation to the NTC in August of 1993. Clearly there was more to this.

LTC Tucker and MAJ Young also offered advice on takeoffs, landings, taxiing, and crew coordination. Many of their ideas seemed logical and easy to grasp, but our experiences as an air assault battalion at the NTC provided some contradictory evidence.

For instance, the authors recommended 30 seconds to 1 minute separation on takeoffs and landings "to allow the previous aircraft's dust to dissipate during multiship operations." Our multiship operations typically included more than 20 mission UH-60s in serials of 5 or 6 aircraft. While a 1-minute separation time would give our ground tactical commanders the ability to mass combat power on an LZ or objective, we found that without a stiff breeze (over 15 knots), the dust clouds would not dissipate unless we had 2- to 5-minute separations. Under NVGs (our normal mission profile) and with zero illumination conditions, vast dense clouds sat on our previous landing sites and back in our PZs.

Perhaps the greatest area of discussion among my leadership was the part of the article where the authors mentioned two landing techniques: roll-on and a "high hover over your intended landing point, and then slowly hover straight down." The roll-on proved disastrous in my August 1993 NTC rotation, because no matter how we tried to beat the dust cloud following us to the ground, we seemed to bump into ruts, fighting positions, brush, or rocks with our forward roll. The high-hover technique seemed unthinkable in the conditions we encountered where huge clouds stirred up by our rotor vortices grew all around any aircraft attempting to hover for any brief period.

Searching for new techniques

What then were the techniques I needed to train my crews that would ensure maximum safety, minimum damage, and still allow me to rapidly build combat power on the LZ?

I called the authors and told them that I had convened a panel composed of my standardization instructor pilot (SP), instructor pilots (IPs), unit trainers (UTs), and flight leads and had given them the task of analyzing our past rotation's mission profiles, accident reports, after action reviews, and interviews with crewmembers. I wanted an exhaustive reconstruction of events, conditions, and mission analysis. The result would be the drafting of a new dust/snow SOP for brigade and division review. With the wholehearted support of the brigade and division safety offices, we began our self-examination.

Results of the analysis

Clearly, the accident reviews pointed to similar circumstances encountered by my crews: multiship formations, arriving at PZs or LZs and finding an incredible amount of residual dust that would not dissipate, and attempts to "outrun" the dust cloud formed by the landing aircraft, which often resulted in aircraft slamming into objects on the ground, damaging sheet metal, landing/searchlights, or MILES gear.

My SP summed up the thoughts of the reviewers: "We think that our forward momentum is the cause of most of our problems. If we can find a way to land with little, or better yet, zero forward ground roll, we'll probably see a tremendous reduction in incidents." Additionally, we formed a consensus on several other issues—

- Multiship formations need greater separation by either time or distance, requiring our infantry brothers to "rethink" their ground tactical plans.
- PZ/LZ reconnaissance by flight leads is crucial to determining suitability and the "on-scene" conditions.
- PZs must allow for greater physical separation between aircraft on the ground to prevent these locations from becoming totally browned out.
- Slingload operations at night under NVGs are high-risk and should be considered only as a last resort.
- Day slingloads are a challenge and can be detrimental to engine health over the long run, but they are doable.

The new draft SOP was completed over the cold, wet winter months at Fort Campbell. During this period, no suitable dusty or snowy conditions existed in the local flying area where we might attempt to validate our findings.

What was the new technique?

The "desert think tank" had come to the conclusion that there should be a way to land in a desert/dust environment that, in all but the most severe conditions, will allow the crew to maintain visual contact with the ground. It must also preclude forward momentum to avoid "going bump in the night."

In theory, what they agreed upon was a modified "steep" approach to a preselected (by the PC) touchdown point. The vertical descent should delay the cloud buildup, while the slower forward airspeed would still allow time for the aircraft to proceed in front of the cloud.

In practice, what actually happened was that the dust cloud would advance forward, with the crew chief calling its position: "tail, cargo door, gunner's window." Then if the pilot's patience held up, we found that the cloud continued past the cockpit and left the crew with a fairly unobscured view of the landing point. If the crew felt uncomfortable, they merely executed a go-around and returned to another location. Many hours of practice led to confidence, skill, and zero incidents.

A training opportunity

In March 1994, we were alerted to provide a company of Black Hawks to go to the NTC to support the famous digitized rotation of the 24th Aviation Brigade. Here was our opportunity to see if the new techniques would work.

In addition to this unforeseen training opportunity, we would also benefit from a more extensive environmental train-up period than previously offered. Once we arrived and completed our mandatory safety classes, the NTC was going to give us almost 1 week of desert flight operations "in the box." Never before, in my experience, has a unit been given the chance to train in the area of operations they would be "fighting" in. We would make the most of this opportunity.

Our philosophy was the same as that established during Operation Desert Storm—crawl, walk, run. My "task force" was composed of crews from both of my line companies. An IP first trained the UTs and flight leads for each company. They, in turn, trained other PCs and crew chiefs. After a week, even the doubters had been won over.

"... huge clouds stirred up by our rotor vortices grew all around any aircraft attempting to hover for any brief period."

The rotation was an unqualified success. We flew missions of every type and under a wide variety of conditions. All of the crews came back to Fort Campbell with rave reviews of our new technique. As the weather improved in the late spring of 1994, we were able to go out to our local training area and find some truly challenging dusty landing areas. The rest of the crews in the battalion got trained on the new technique by our desert-experienced crews. The objective was our next battalion rotation, 94-09, which would be the first-ever Air Assault rotation at NTC.

NTC rotation 94-09

We flew six brigade and battalion air assaults, typically employing 24 mission UH-60As/Ls, 3 UH-60 spares, a DART/SAR aircraft, a command and control console bird, 3 EH-60s, 3 UH-60V medevac aircraft, and 8 CH-47Ds. The battalion had zero accidents or incidents and caused the chief of the operations group to say that rotation 94-09 was the safest aviation rotation ever at the NTC.

Keys to success

Our success hinged on the following three key factors.

■ Breaking the mindset that forward roll was the answer to overcoming the dust clouds. Unless you fly and work in a flat, almost featureless desert, forward roll will ultimately do you more harm than good. There are just too many random things to bump into—day or night.

■ Being very critical in the selection of PZs and LZs. PZs should always be reconned for every type of aircraft that will use them; for example, CH-47s present a different challenge than an OH-58. LZ selection should include a recon if possible. If that is not possible, a map recon for slope, vegetation, or surface composition should be performed.

■ Training up as crews—day, night, NVG, and then NVG-in-formation modes. I cannot overemphasize the importance of this. The confidence building and team building that goes on through such a process is invaluable. You can tell your crew what it will be like, or you can go through it together, collectively analyzing the risks, techniques, and lessons learned along the way. When you have completed numerous repetitions of landing in increasingly tougher conditions, the shared knowledge and expertise is a combat multiplier.

I am proud of the accomplishments of some very fine soldiers who conceived the techniques, trained others to do them properly, and who refused to accept the results of the previous year as "the cost of doing business at NTC." Clearly these aviators relished the challenge and thoroughly enjoyed proving what proud professionals everywhere in Army aviation know—you can always find a way to do difficult things with less risk through good training.

POC: LTC Marshall T. Hillard, Commander, 4th Battalion, 101st Aviation Regiment, Fort Campbell, DSN 635-4015/3189 (502-798-4015/3189)

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Selected Aircraft Mishap Briefs

Information based on preliminary reports of aircraft mishaps reported.

MANNED

UH-60

- During a scheduled vibration data collection engine run, the maintenance pilot observed a low oil pressure condition during the engine shutdown sequence. Upon inspection of the engine, the oil cap was misplaced and engine oil was in the engine bay area.
- The aircraft had a preventive maintenance daily inspection performed and the engine was serviced with oil. It is suspected that the cap was not secured properly, and during the run the pressure inside the engine dislodged the cap and allowed oil to be purged out of the reservoir, resulting in low oil pressure during the run. (Class C)
- While training in the local restricted area, three UH60s were flying in a multi-ship formation at terrain/NOE altitudes practicing low-altitude maneuvers. While initiating a descent at a downhill slope area, the pilot on the controls misjudged the hill location and struck the tail wheel on the crest of the hill. The crew landed at a nearby safe location and identified the tire had come off the bead of the wheel, and the wheel had cracks and chipping. (Class E)

AH-64

- During takeoff for a training flight mission, the crew experienced a Generator 1 failure. The crew declared an emergency and landed back at the airfield. There were no indications during run-up or prior to takeoff. This is the seventh generator failure incident for this unit since July of 2023. (Class D)

H-72

- During a routine training flight, the A/C compressor belt broke and was ingested by the engine. This caused damage to the No. 2 Engine axial compressor (MOD 2) and the gas generator (MOD 3). MOD 2 and MOD 3 replacement were required, along with the A/C compressor, compressor drive belt and receiver/dryer. The aircrew did not notice any abnormalities, noises or vibrations and were unaware that the A/C belt had broke. Damage was found on post-flight by maintenance personnel. (Class C)

CH-47F

- On departure conducting LOAs at about 75' AGL, aft right work platform locking pin sheared and the platform opened in flight, causing significant damage to platform and support stringer.
- During preflight, the flight engineer noticed a problem with the right aft pylon forward latch. He made mention to the pilot in command (PC). The PC noticed the pin was loose and lifted the pin to close the latch. They decided to wait until their return to have maintenance replace the latch. Upon takeoff, the work platform worked the pin loose, allowing the wind to open the door and flexing the work platform until it dislodged the aft latch. This caused the work platform to open completely, ripping the support cable from the aircraft main attachment. (Class C)

UNMANNED

MQ-1C

- Aviation Maintenance personnel were attempting to connect a tug to the towbar to tow it to the flightline and begin pre-flight for a 1200L takeoff. The towbar was connected to the AV front landing gear first and then SM No. 1 gave instructions to SM No. 2 to reverse the tug and connect to the towbar. Instead of hitting the brakes as he closed in on the towbar, he mistakenly pressed his foot on the gas pedal. When this happened, it temporarily forced the GE to lift, which caused the rudders to make slight contact with the ground. No injuries were sustained due to the mishap. (Class E) ■

Near Miss Briefs

Information based on reports via the Near Miss Reporting Tool.

62285

During the daily inspection after a training flight, the Integrated Vehicle Management System (IVHMS) wire was discovered to have come loose and was partially wrapped around the upper portion of the Section 4 tail rotor drive shaft. Safety and maintenance personnel were notified. The initial diagnosis of the cause is that a service loop on the wiring worked its way to close to the Section 4 driveshaft over time through vibrations. Eventually the loop caught on a driveshaft rivet and ripped the wires out of the IVHMS accelerometer. There was no other damage to the aircraft other than the accelerometer and wiring to it needing replacement.

62146

While refueling a UH-72A helicopter, the fuel indication on the caution advisory display went blank and was associated with a fuel quantity fail caution. After troubleshooting the problem, a fuel sample was taken to reveal water contamination. The contaminated fuel was completely drained from the aircraft and replaced with fresh fuel, causing the fuel indication to display normally. Another fuel sample was taken to confirm that there was no more water left in the tank and a ground run was completed to ensure the fuel system was fully operational. It was discovered that a hatch on the facility's fuel trucks was left open during inclement weather, allowing water to contaminate the fuel.

62091

While conducting engagements in an AH-64D, the pilot in command (PC) instructed his co-pilot gunner (CPG) to de-action the missile system as they began their turn away from the templated target location. The CPG had their targeting sensor still on the target and actioned the gun instead. After detecting the improperly actioned weapon system, the CPG de-actioned the gun. During the process of the gun stowing, the gun contacted the aircraft ski. The gun miss-tracked and emergency stowed itself, displaying a fault on the page, not allowing the crewmembers to know if the gun was caught under the ski or stowed properly. The PCs actions to determine the gun's position prior to landing allowed for no further damage to the gun or aircraft. Upon inspection, it was determined there was no damage to the aircraft ski or gun.

62116

During a pre-phase maintenance test flight (MTF) in an AH-64D, the crew experienced a main transmission chip caution that caused them to have to land as soon as possible. The crew executed a precautionary landing without incident. The caution remained all the way through the landing of the aircraft. There were no injuries to the crew.

61981

Crew experienced a fire light while transiting northern Arizona. The crew executed a precautionary landing and inspected the aircraft. Flight operations executed a pre-accident plan successfully. No fire was determined to have occurred. Aircraft was flown home successfully.

62090

During a daytime bag flight in an AH-64D, crewmembers were conducting RL progression when they experienced a rotor overspeed while conducting an autorotation. The instructor pilot (IP) was in the front and the pilot (PI) was in the back seat. IP had demonstrated four autorotations, discussed how the rotor reacts when operating in a heavy aircraft, the proper control inputs to establish the autorotation and how to check the rotor system to maintain the rotor within operating limitations. Once established for the autorotation, the PI rapidly made control inputs to reduce TQ below 10% (ATM Standard: rotor above 101% or TQ below 10% for AH-64D) focusing solely on TQ. In the descent, both crewmembers allowed the airspeed to get too fast. The IP realized the rising rotor speed checking the rotor system to maintain the rotor within limits. The PI saw the TQ increase from the IP's correction and reduced the collective further to maintain TQ below 10%. In the descent with the PI's additional reduction in collective paired with high airspeed, the rotor rapidly increased to the point where the IP could not check the rotor fast enough without placing the aircraft in a worse situation. Crewmembers were able to safely recover the aircraft. The overspeed happened in the descent prior to the deceleration on a windy day with intermittent headwind conditions. Upon inspection of the aircraft, the rotor speed was 110.32 for .32 seconds. No damage to aircraft systems or components.

61731

SM was performing aircraft maintenance duties during annual training when he found a bag on one of the phase maintenance tables. The SM realized that the bag contained critical shims for one of the installed vibration absorbers. He immediately reported the bag to his supervisor and corrective action took place.

61739

During a routine training flight, the crew was working on hovering tasks when a bird flew directly up into the rotor system and impacted a blade. The crew stopped training at that time and returned to base. While flying back to base, the crew experienced a No. 1 Gen caution and performed all checklist steps, regaining the No. 1 Generator. Maintenance conducted an inspection and found no damage to the blade and that the No. 1 Gen caution was unrelated to the incident.

61788

While conducting routine maintenance, maintenance technician found a piece of rubber stripping below the co-pilot seat. The piece of rubber, approximately 12 inches by 1/4 inch, came from the seat edge and had worked its way under the avionics boxes under the seat. No residual damage was found. A FOD check was completed on the aircraft, maintenance was completed and the aircraft returned to service.

61792

HH-60M was cleared for and established on ILS RWY35L while a commercial 737 was cleared to maintain altitude and turn downwind to RWY35R. The commercial aircraft failed to follow ATC instructions and descended in front of and within 400 feet of the HH-60M on ILSRWY35L. The HH-60M IP suspected that the 737 never saw them. The tower announced to the commercial 737 to contact the tower on landing for the pilot deviation. ■

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Class A - C Mishap Tables

Manned Aircraft Class A – C Mishap Table											as of 31 OCT 24
	Month	FY 24					FY 25				
		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	6	0		0	1	5	0	
	November	3	1	9	5						
	December	0	0	8	0						
2nd Qtr	January	1	1	10	0						
	February	4	2	7	2						
	March	3	0	5	2						
3rd Qtr	April	1	1	13	0						
	May	1	0	9	0						
	June	0	0	10	0						
4th Qtr	July	0	0	11	0						
	August	4	1	10	0						
	September	0	0	8	0						
	Total for Year	17	6	106	9	Year to Date	0	1	5	0	
	Class A Flight Mishap rate per 100,000 Flight Hours										
	5 Yr Avg: 0.99		3 Yr Avg: 1.15		FY 24: 1.90		Current FY: 0				

UAS Class A – C Mishap Table									as of 31 OCT 24
	FY 24					FY 25			
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total
MQ-1	1	2	3	6	Gray Eagle				
RQ-7	0	7	9	15					
RQ-11			1	1					
RQ-20			0	0	Puma				
SUAV					SUAV				
Other					Other				
UAS					UAS				
Aerostat					Aerostat				
Total for Year	1	9	13	22	Year to Date				
UAS Flight Mishap rate per 100,000 Flight Hours									
MQ-1C Class A	5 Yr Avg: 7.35		3 Yr Avg: 7.98		FY 24: 1.56		Current FY: 0		


What's the
RUSH
If an aircraft emergency occurs in flight, know your actions:
F ly the aircraft
A lert the Crew
D iagnose the emergency
E xecute the emergency procedure
C ommunicate
F ly the aircraft
Be trained and prepared, know your aircraft PPC data, and don't turn a "land as soon as practicable" into an aircraft mishap.
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1. IAW TC 3-04.11, Commander's Aviation Training and Standardization Program, Senior Mission Commanders (SMCs) must allow adequate time for aviation units to execute the aviation commander's ATP. This ensures the required levels of proficiency are achieved at the ________, ________, and __________, and at echelon (as required), prior to aviation units conducting collective (platoon and above) combined arms maneuver training with supported ground maneuver units.
2. What does RL stand for and why is it used?
3. What does FAC stand for and how are they determined?
4. What does ATM stand for?
5. What are 1000, 2000, and 3000 series tasks?

Answers:

1. Individual, leader, and crew level
2. Readiness Level. Aviation commanders use a series of RLs to develop individual and crew proficiencies that support collective tasks. RLs identify the training phase in which ACMs are participating and measure ACM readiness. Commanders evaluate each duty position to determine how it can best support the unit's METL and/or collective task(s).
3. FAC - Flight Activity Category. FAC levels are determined based on flight task requirements and the proficiency required by the MTOE or TDA position.
4. Aircrew Training Manual
5. The task title identifies a clearly defined and measurable activity.

1000-series tasks are base tasks that generally apply to all aircraft in a specific category. They are the entry-level tasks that are common sub-components of more advanced tactical and mission tasks.

2000-series tasks are tactical tasks that act as building blocks for performing Army Aviation missions. Some 2000-series tactical tasks are mandatory (identified in the MTL) and others are optional based on the mission of the unit.

3000-series tasks are mission tasks that prepare individuals and crews to perform collective operations. Some 3000-series mission tasks are mandatory (identified in the MTL) and others are optional based on the mission of the unit.

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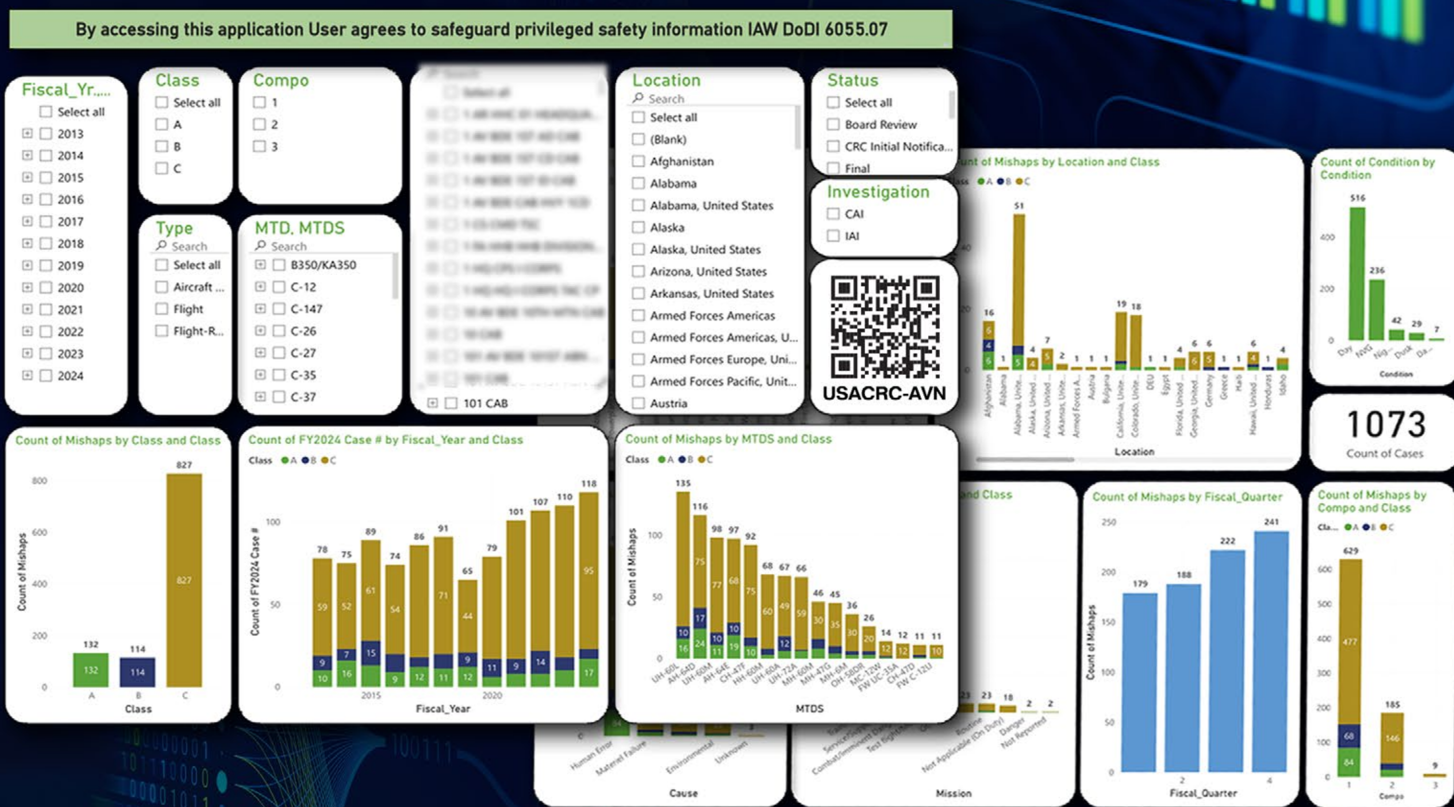

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