Flightfax
Number 139 January 2025 Online Newsletter of Army Aircraft Mishap Prevention

FY24 Aviation Annual Assessment

FY24 will be a year that Army Aviation looks back on in hopes of never repeating. After years of a steady decline in mishap rates per 100,000 hours beginning in 2006, FY23 saw a twofold increase in mishap rates from FY22's record low 0.50 Class A mishaps per 100,000 hours. Then FY24 produced a Class A flight mishap rate almost four times greater than FY22, with a rate of 1.90, (See Figure 1).

FY24 had the most Class A flight mishaps since FY14 and the worst Class A flight mishap rate per 100,000 hours since FY07. There were 15 Class A flight mishaps and two Class A aircraft ground mishaps in FY24, compared to nine flight and one aircraft ground in FY23, and four flight and four ground mishaps in FY22. Nine Soldiers, one contractor and one one civilian died in flight mishaps, and another contractor died in an aircraft ground mishap (See Figure 2).

The most obvious trend in the FY24 mishaps was the AH-64 fleet being overrepresented with nine of the 15 Class A flight mishaps. Eight of the AH-64 mishaps were attributed to human error, with two of those being attributed to maintenance errors. The final AH-64 mishap was a bird strike. Additionally, the UH-72 had three Class A mishaps, which was more than in any year since its fielding. There were single mishaps in variants of the UH-60, the CH-47 and the C-12. There was also a Class A environmental event that damaged over 40 aircraft and a C-12 Class A aircraft ground mishap during maintenance operations (See Figure 3).

As part of the analysis involved in the USACRC's mission, we looked at AH-64E mishaps that involved uncommanded right yaws at high power settings and low airspeeds. In FY23 and FY24, there have been five of these mishaps. Analysis of the

Figure 1. FY20 vs. FY24 Rates for H-64

2020 FISCAL YEAR	H-64 MDS	1 Class A	0.84 Class A Rate	6 Class A-C	5.01 Class A-C Rate	119739 Hours	2 Fatalities
2024 FISCAL YEAR	H-64 MDS	9 Class A	7.02 Class A Rate	18 Class A-C	14.04 Class A-C Rate	128183 Hours	2 Fatalities

Figure 2. FY24 Rates for All MTDS

2024 FISCAL YEAR	All Army MDS	15 Class A	1.90 Class A Rate	66 Class A-C	8.35 Class A-C Rate	790598 Hours	9 Fatalities
2024 FISCAL YEAR	FW MDS	1 Class A	1.01 Class A Rate	2 Class A-C	2.02 Class A-C Rate	99022 Hours	0 Fatalities
2024 FISCAL YEAR	H-47 MDS	1 Class A	1.34 Class A Rate	7 Class A-C	9.36 Class A-C Rate	74776 Hours	0 Fatalities
2024 FISCAL YEAR	H-60 MDS	1 Class A	0.32 Class A Rate	21 Class A-C	6.62 Class A-C Rate	317156 Hours	5 Fatalities
2024 FISCAL YEAR	H-64 MDS	9 Class A	7.02 Class A Rate	18 Class A-C	14.04 Class A-C Rate	128183 Hours	2 Fatalities
2024 FISCAL YEAR	H-72 MDS	3 Class A	1.85 Class A Rate	7 Class A-C	4.31 Class A-C Rate	162368 Hours	2 Fatalities

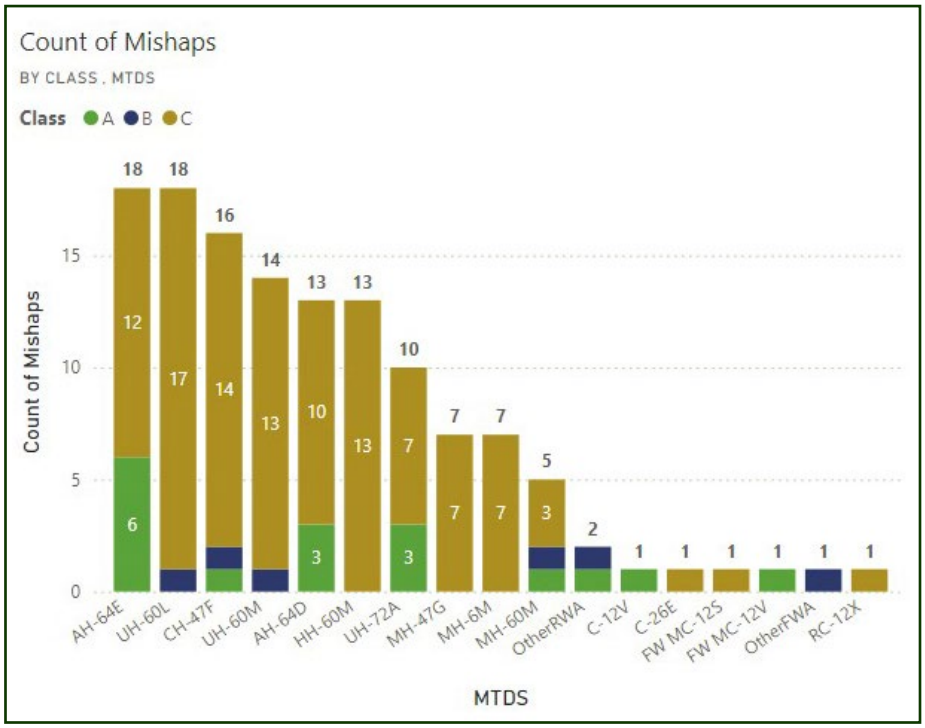
mishap data from the data recorders indicate that in every case, the crew never achieved a full left pedal input to offset the right yaw. This led to the yaw accelerating and the crew being unable to recover. As a result of this and other analysis, power management and loss of tail rotor effectiveness became key areas for training during the Army-wide Safety Stand-Up.

Another area of analysis into the increase in mishaps over the last two FYs is a comparison study of aviator flight experience between 2013 and 2023 data. Centralized Aviation Flight Records System (CAFRS) data was analyzed across the active force, and we found that the average flight experience across the force is down approximately 300 flight hours per aviator over the 10-year period. While crew experience was not cited in every mishap, this overall loss of experience is a hazard that must be considered. Initial results from a similar study of Compo 2 and 3 aviators indicate a drop in experience, but not as significant as the active force.

There is some good news. After the Army-wide Safety Stand-Up in April, the Class A mishap rate for the remainder of the FY was 0.86 per 100,000 hours, which compares favorably with the FY19-23 five-year average of 0.84 per 100,000. As of this writing, there have been no Class A or B aviation flight mishaps in the first quarter of FY25. Continued diligence and training are the key to getting back to the below 1.00 rate that has become the standard for us all. Fly Army Safe! ■

Aviation Division
Directorate of Analysis and Prevention
U.S. Army Combat Readiness Center

Figure 3. FY24 Mishaps by Classification for All MTDS



Mishap Review – *Mishap Review of MC-12V Off Runway Landing*

History

An MC-12V aircrew was performing an approach under visual meteorological conditions (VMC) when the aircraft impacted the ground prior to reaching the designated point of landing which resulted in a total loss of the aircraft. This event occurred at night during a steep approach angle with no visible horizon. A loss of situational awareness and a lack of positive aircraft control were key factors in the mishap occurring.

The aircraft entered a rate of descent of approximately 3000 feet per minute at an altitude of 1500 feet above ground level. The aircrew attempted to regain the desired Vertical Flight Path mode by disengaging and reengaging the Vertical Navigation Mode button multiple times while the aircraft continued descending toward the ground. Soon after, the PI noticed the airfield runway lights rising in the windshield and took the controls from the PC, added power, increased pitch, and impacted the ground.

Crew Experience

The Pilot-in-Command (PC) had 309 hours in the C-12 and 391 total flight hours. The pilot (PI) had 539 total hours in the C-12 and 620 total flight hours.

Comments

This mishap shows the importance of good situational awareness and aircrew coordination. Effective communication and coordination between crew members is crucial in aviation and must become second nature before, during and after each mission.

Understanding the operational environment is also a key component to mitigating risk. The nighttime steep approach angle in complete darkness and lack of visible horizon cues only exacerbated the situation for the aircrew.

To prevent similar mishaps from occurring, it's important for pilots to:

- thoroughly understand their aircraft systems and limitations.
- develop effective crew coordination and communication strategies.
- be aware of their surroundings and the aircraft's state, even when relying on automation.
- recognize the potential risks of over-reliance on automation, especially in challenging environmental conditions.

By addressing these factors, pilots can reduce the risk of similar mishaps and ensure mission success. ■

Forum

Op-ed, Opinions, Ideas, and Information

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

The Case for Military Flight Operations Quality Assurance (MFOQA)

MFOQA (pronounced M-fowkwa) besides being a clever combination of an initialism and an acronym is the military version of Flight Operations Quality Assurance (FOQA). FOQA began with the Civil Aeronautics Administrations rule that required flight data recorders. These early recorders monitored six parameters and were an invaluable tool for reconstructing mishaps particularly when there was little or no evidence. Airlines in Europe and Asia began reviewing routine flight data and are credited with having the earliest FOQA programs. Civilian Flight Operations Quality Assurance is a voluntary safety program that uses data that is collected from airframes in proactive rather than reactive ways. Historically, digital source collectors have been used to put the pieces together following an aviation mishap. FOQA programs use this same source of data to break the chain of events that often leads to a mishap. FOQA programs are meant to enhance but not replace other safety initiatives (Brandt, M. 1999).

In 2005 each of the military departments were directed to implement MFOQA processes by a memorandum from the Secretary of Defense. In response to the 2005 directive the Army developed the Aviation Data Exploitation Capability (ADEC) as a program of record that included MFOQA processes but pulled funding in 2018 just prior to initial fielding. In 2017, Department of Defense Instruction (DoDI) 6055.19 codified Aviation Hazard Identification and Risk Assessment Programs with MFOQA being one of the components. MFOQA is a non-punitive, identity-protected program designed to root out hazards, not punish pilots or crews.

The USAF has successfully implemented a program across manned and unmanned fixed and rotary winged platforms using government-owned software. Each month approximately 6.5 terabytes of data is analyzed from 22,000 flights. Analysis of flight data is conducted at the MAJCOM level and pushed to lower levels by analysts when a problem is detected.

Why now?

Everyone we talk to across the aviation enterprise acknowledges our experience deficit, that, coupled with complex equipment and a class A rate of 1.90 per 100,000 flight hours, is reason enough (rate was 0.5 in 2022). We're collecting the data and analyzing it to root out materiel issues (less than 20% of mishaps), why not use it to prevent human error mishaps? We believe data analysis would have forewarned the Army that some Apache aviators were flying with the SAS saturated in the yaw axis and allowed us to get ahead of the uncommanded right yaw issue we experienced in FY 24. That analysis alone could have saved the Army three AH-64E aircraft. We also believe that knowing someone is reviewing aircraft data will change the way some individuals and organizations operate. Case in point, there was an organization in the 1990s that flew 85% of the flying hours at night. The organization's SOP required an operational video

recording system for night flights and for it to be recording during flight. After completing flights, battalion standardization personnel would routinely conduct tape reviews with aircrews. If the aircrews were not out doing what they were briefed to do these reviews wouldn't end well. Knowing that aircrews may have to sit down and review their tape with one of the standardization pilots was always in the back of their mind and influenced their behavior.

As pilots, we have a significant responsibility not only to ensure the safety of our aircrew and passengers, but also to protect the valuable assets (aircraft) entrusted to us by the taxpayers.

The use of flight data analysis, often referred to as Military Flight Operations Quality Assurance (MFOQA) can be a powerful tool in preventing mishaps and improving overall safety. By analyzing data from flight recorders, such as flight data recorders (FDRs) and cockpit voice recorders (CVRs), operators can identify trends and patterns that may indicate potential safety risks.

This proactive approach can help to:

- Identify and address pilot errors or bad habits before they lead to a mishap.
- Detect potential mechanical issues with the aircraft before they become major problems.
- Improve pilot training and procedures to reduce the risk of mishaps.
- Enhance overall safety culture within the organization.

While it's understandable to have concerns about "big brother" monitoring, the primary goal of flight data analysis is to improve safety, not to punish or scrutinize individual pilots. By using data to identify potential safety risks and addressing them proactively, pilots can help to ensure a safer and more efficient operation. ■

Aviation Division
Directorate of Analysis and Prevention
U.S. Army Combat Readiness Center (USACRC)

Blast From The Past

Articles from the archives of past Flightfax issues: December 2000

UNITED STATES ARMY HAS BANNER YEAR IN SAFETY

The U. S. Army just completed one of its safest years in history. Army aviation accidents and fatalities are at an unprecedented low, and ground and vehicle accidents and fatalities have also been reduced from previous years. The largest reductions were in Army aviation. Aviation flight fatalities have dropped from 22 in Fiscal Year 1999 to four in FY 2000, an 82-percent reduction. Class A and B flight accident rates for FY00 show a 70-percent reduction from FY99.

Not only did fatality rates decline in the aviation community, but the Army also closed out FY00 with its second-lowest year ever of ground and privately owned vehicle (POV) fatalities. POV accidents, notoriously the number-one killer of soldiers, claimed the lives of 114 soldiers in FY00, compared to 124 in FY99. On-duty ground fatalities dropped from 32 in FY99 to 27 in FY00, a 15-percent reduction.

Brigadier General Gene M. LaCoste, Director of Army Safety and Commander of the U.S. Army Safety Center, said this year's safety successes were possible because the Army—soldiers, civilians and family members—all worked together to manage risk effectively both on and off duty.

According to LaCoste, the FY00 safety success can be attributed to four factors:

- Leadership involvement, which equates to command emphasis on safety programs.
- Improved ability of soldiers to identify hazards, assess risks those hazards impose, and implement controls to mitigate the risks.
- Enforcement and adherence to standards by leaders and soldiers.
- Improved self-discipline.

"The Army's emphasis on the basics of leadership, standards and discipline is evident in the lives we saved and in the degree to which we enhanced our combat readiness by preserving both our people and our materiel resources," says LaCoste.

While the Army enjoyed a record-breaking year in safety, there's still work to do. "We can never rest on our laurels. The numbers and rates aren't low enough. The numbers and rates will never be low enough if we lose even one soldier or civilian."

"Safety success is fragile," said LaCoste as he cautioned that we must stay focused on the missions and prioritize requirements. "To ensure that we continue to set soldiers up for success, we owe it to them to intensify our efforts to fully integrate risk management into our training, leader development, and materiel systems designs." By doing these things, LaCoste said, the Army can continue to achieve significant gains in safety.

Selected Aircraft Mishap Briefs

Information based on preliminary reports of aircraft mishaps reported.

MANNED

H-60

- During a maintenance test flight and while conducting Task 4228 Conduct Vibration Absorber Tuning (AB Tuning) on a UH-60L, the maintenance test pilot conducting the check failed to note the turbine gas temperature (TGT) rising above limits. The TGT rose to a temperature of 953 degrees Celsius and maintained temperature above 948 for 39 seconds. This resulted in an over-temperature and maintenance was required at the cost of $80,142. The aircraft returned to base with no other injuries or damage. (Class C)

- While conducting day VFR flights, an MH-60M struck a fishing line that was suspected to have been suspended by a kite or balloon and attached to a vessel. The hook became attached to the aircraft and subsequently caused minor damage to the horizontal stabilator. The strike occurred along a pre-planned route at approximately 30' AWL. The crew stated that as they turned away from a vessel (never closer than .3 to .5 nm), they noticed a suspended string passing the aircraft. While conducting a visual check, the crew chiefs noticed a fishing line trailing the aircraft. The aircrew conducted a precautionary landing, assessed the damage and received a one-time flight back to home station. There were no injuries and the stabilator sustained minor, repairable damage. (Class E)

H-64

- While conducting the pre-flight inspection on an AH-64, the aircrew failed to adequately perform Step 1 of the before exterior check resulting in the engine No. 2 inlet cover remaining installed during engine start procedure. Due to engine start with the inlet area being obstructed, the engine No. 2 Cold Section Module had to be replaced at a cost of $72,559.70. (Class C)

- While conducting aerial gunnery, a single AH-64E extended forward avionics bay (EFAB) door came open in flight, resulting in damage to the aircraft EFAB door. No additional damaged was assessed for this mishap. (Class E)

H-47

- Upon aircraft landing and approach, an individual was briefed on where to remain while the aircraft was in operation. The individual left the designated area established for safe viewing and approached the aircraft while it was landing. The civilian walked into rotor wash from the landing aircraft and tripped over a street curb, falling to the street and suffering a fractured pelvis. (Class C)

UNMANNED

MQ-1C

- An MQ-1C Gray Eagle crew performed a recovery landing after receiving an advisory warning and confirming that the left landing gear had not fully retracted. The crew was able to manually retract the landing gear and land the aircraft safely. After post inspection, it was found that a servo component was compromised. (Class C) ■

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https://safety.army.mil/MEDIA/Poster-Library/Posters

Near Miss Briefs

Information based on reports via the Near Miss Reporting Tool.

66307

During a training flight, an AH-64E Apache aircrew experienced a "GENERATOR 1" failure and conducted a precautionary landing, resulting in loss to the generator. The aircrew required DART support. No personnel were injured, and no other equipment was damaged.

66467

During a PMD on an aircraft the morning after it flew, a FAT (free air temperature) gauge was found to have been left inside the avionics bay. The maintenance company was conducting a cable tension check on a UH-60, which involved safety wiring a FAT gauge on the ceiling of the avionics bay above the tail rotor cables. A write-up was completed on the work that was done. The next day, the aircraft was pre-flighted and the FAT gauge was missed due to its odd location, and the crew flew the aircraft. The mission was completed at night, which postponed the PMD until the following day. The FOD was found during the PMD and reported to the MTP.

66558

Aircrew was performing a preflight on a CH-47 prior to a maintenance test flight. The maintenance test pilot noticed a small piece of safety wire on the quick-connect shelf of the No. 2 engine compartment. The aircraft was removed from flight status and a FOD check was performed by quality control before placing the aircraft back on flight status.

66575

During a daytime training flight (PAR approach), an aircrew flying an AH-64D received a "Primary PSI Low" advisory. The aircrew immediately executed the FADEC-F process and determined that the emergency was a "Land as Soon as Possible." The aircrew made a mayday call and declared an emergency over the tower frequency, landing in an open gravel pit safely. A unit MTP overheard the traffic and located the downed aircraft, and then proceeded to land next to them. After inspection, the MTP determined that the AH-64D was experiencing false indications and the aircraft received approval for a one-time flight back to the airfield.

66829

During routine maintenance, maintenance personnel heard something metallic roll around in the APU compartment. After examining all nearby hardware, it was determined that nothing was missing. After removing the fairing behind the APU exhaust, a metal pencil end with eraser was discovered. No other FOD was discovered after a thorough search of the adjoining spaces.

66951

While conducting a service mission and on final approach to home base, the UH-72 aircrew received a caution on the CAD indicating a "#2 HYD PRESS" failure. The aircrew performed FADEC-F and landed safely at home base.

67035

After completing in-flight maintenance checks while at the compass rose at a local airfield, the "#2 ENG Chip Caution" illuminated. The UH-72 returned to parking and was shut down without incident. Maintenance did not find any chips on the detector.

67250

A UH-60 Black Hawk aircrew was flying northwest at ~2,500′ MSL/700′ AGL and was returning from a resupply mission for flood victims. Approximately 9 NM SE of the local municipal airport, the left seat pilot saw what appeared to be a bird at the low 10 o'clock position flying southeast and not a safety factor for continued flight. When the object transitioned from forward flight to vertical flight to match the helicopter's flight level, the left seat pilot realized the object was a drone and passed within an estimated three rotor disks, or ~160′, of the aircraft. Course correction was not required as the drone had passed the 9 o'clock position and was not a risk factor for forward flight. ■

Class A - C Mishap Tables

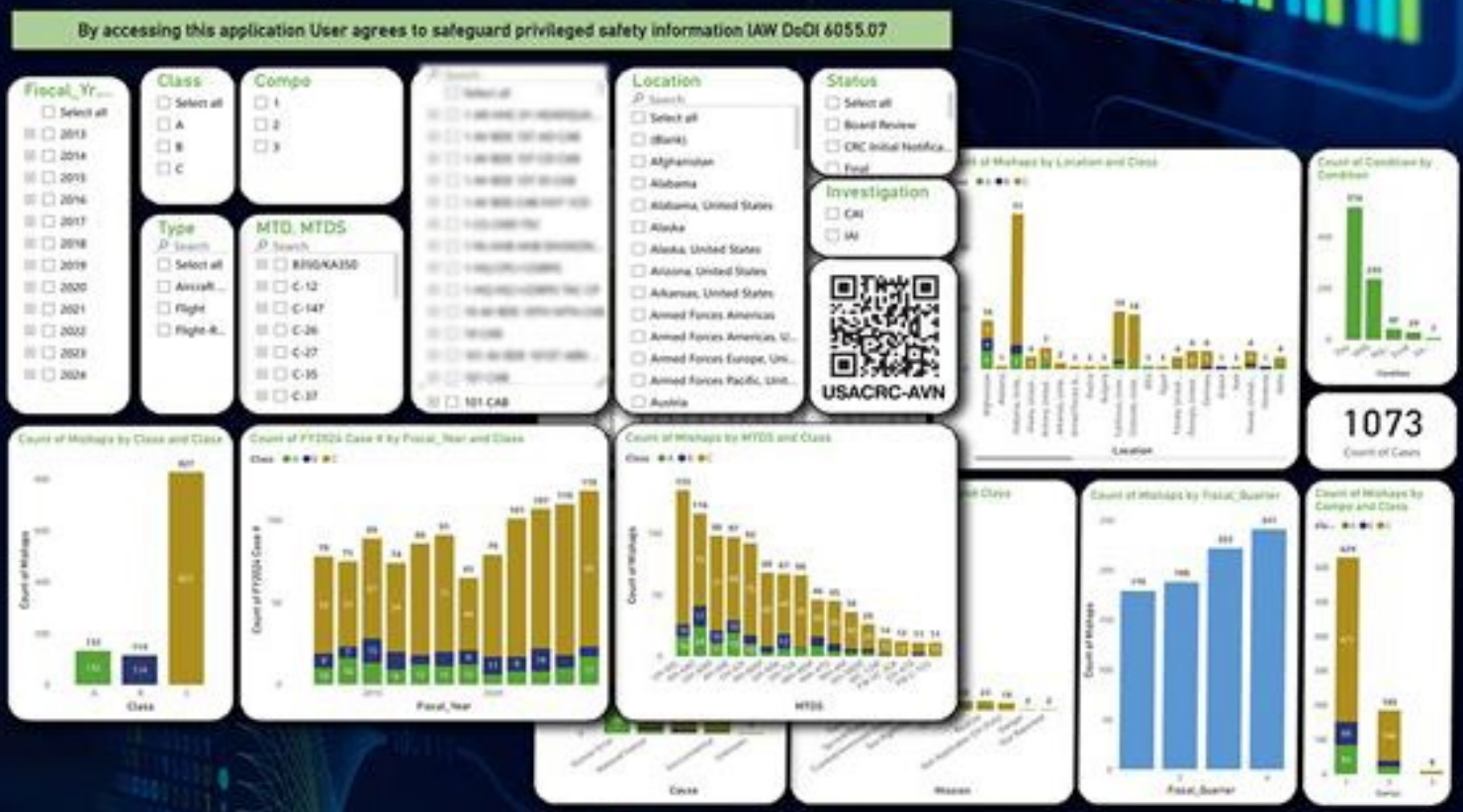
	Manned Aircraft Class A – C Mishap Table						as of 19 DEC 24			
	Month	FY 24					FY 25			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities
1st Qtr	October	0	0	6	0		0	0	10	0
	November	3	1	9	5		0	0	2	0
	December	0	0	8	0		1	0	8	1
2nd 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	1	0	20	1
	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 19 DEC 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	1	3	5	Gray Eagle	1	0	1	2
RQ-7	0	7	8	15	Ghost-X	0	0	3	3
RQ-11	0	0	1	1					
RQ-20					Puma				
SUAV					SUAV				
Other			3	3	Other				
UAS					UAS				
Aerostat					Aerostat				
Total for Year	1	8	15	24	Year to Date	1	0	4	5
UAS Flight Mishap rate per 100,000 Flight Hours									
MQ-1C Class A	5 Yr Avg: 6.03		3 Yr Avg: 4.53		FY 24: 1.55		Current FY: 10.19		

Aviation Analytics Dashboard

If you are in an ASO position and/or performing Safety as your primary SQI/Track, click the link below to request access to the USACRC Aviation Analytics Dashboard.

https://safety.army.mil/ON-DUTY/Aviation



- A Mishap Prevention Tool for Aviation Safety Officers
- Searchable Aviation Analytics application in MS Teams
- Dynamic Visualizations for Briefings/ Exportable Products
- Mobile applications on Government Furnished Equipment

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1. If a sudden unanticipated right yaw occurs, you should apply ____ ____ _____ while simultaneously applying _____ _____ control to increase speed.

2. What are the three categories of Small Unmanned Aircraft Systems?

3. Which causal factor continues to be the leading cause of aircraft mishaps throughout Class A-C mishaps and, if not mitigated, can lead to a higher-class mishap?

4. _____ _____ _____ interact with the mission crew or air mission commander to identify, assess and mitigate risk for the specific mission.

5. The USACRC Aviation Analytics Dashboard is available to all ASOs from the _____-level down to the _____-level to help them manage their commander's safety programs.

Answers:

1. full left pedal/forward cyclic (Flightfax Issue 128)
2. Short-range reconnaissance, Medium-range reconnaissance, Long-range reconnaissance (Flightfax Issue 132)
3. Human Error (Flightfax Issue 133)
4. Mission Briefing Officers (Flightfax Issue 134)
5. brigade/ company (Flightfax Issue 136)

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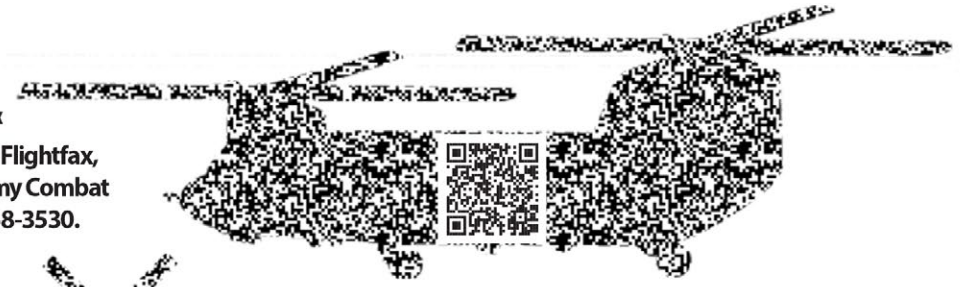
If you have comments, input, or contributions to Flightfax, feel free to contact the Aviation Division, U.S. Army Combat Readiness Center at com (334) 255-3530, DSN 558-3530.



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FY24 MISHAP RATES

MANNED AIRCRAFT MISHAP RATE								
FY	Hours	Army Fatal	A	A FLT	A FLT Rate	A-C	A-C FLT	A-C Rate
FY24	790,598	9	17	15	1.9	130	65	8.22

UNMANNED RQ-7B MISHAP RATE								
FY	Hours	Class B	B FLT	B Rate	Class C	C FLT	C Rate	B-C Rate
FY24	10,541	7	7	66.41	8	6	56.92	123.33

UNMANNED MQ-1C MISHAP RATE							
FY	Hours	Class A	A FLT	A Rate	Class A-C	A-C FLT	A-C Rate
FY24	64,516	1	1	1.55	5	3	4.65