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Flightfax®

Online Report of Army Aircraft Mishaps

TRADOC Capabilities Manager (TCM) for Unmanned Aerial Systems (UAS) describes what unmanned aerial systems provide to operational units. “The Army’s experiences in Operation Enduring Freedom and Operation Iraqi Freedom prove that UAS significantly augment mission accomplishment by reducing Soldiers’ workload and their exposure to direct enemy contact. UAS serve as unique tools for the commander, which broaden battlefield situational awareness and the ability to see, target and destroy the enemy by providing actionable intelligence to the lowest tactical levels.”

Clearly, UAS provides a vital capability to the commander. However, with the loss of a vehicle it can be a distraction for the commander – both in the reduction of available assets and the need to complete the appropriate mishap reporting and investigation requirements.

Year to date, we are tracking Aviation Mishaps as 12 Class A, 6 Class B, and 47 Class C incidents. As a departure from the regularly scheduled regurgitation of stats on the front page of Flightfax, let’s look at an interesting point about these numbers. When breaking out the Unmanned Aerial System (UAS) numbers from the totals, it is interesting to learn that 33% of Class A (4 mishaps), 33% of Class B (2 mishaps), and 32% of Class C (15 mishaps) involve UAS. The UAS mishap rate for Class A – C per 100,000 flight hours is approximately 49.3. Comparatively, the manned aviation mishap rate this fiscal year for Class A – C mishaps is approximately 4.41. The stats indicate, when looking at unmanned mishaps rates in the context of manned aviation mishap rates, that more focus on risk mitigation for UAS would enhance mission capability for the commander.

Understanding that UAS when involved in mishaps tend to detract, rather than enhance, the commander’s mission capability, makes the next paragraph somewhat alarming.

Many UAS mishaps are not reported. This discrepancy becomes obvious when comparing PM UAS loss and replacement stats to Risk Management Information System (RMIS) data. As an example, this fiscal year there have been nine RQ-7B Shadow Class A – C mishaps reported to the USACR/Safety Center. PM UAS has a total of 28 reported mishaps indicating nearly two-thirds of the Shadow mishaps do not reach the Safety Center’s database. The old adage goes “garbage in, garbage out.” If mishap information is not reported, then commanders are unable to provide mitigation across training, standards, and maintenance areas. Without the proper submission of incidents, analysis becomes difficult and discerning trends even more challenging.

This Flightfax is dedicated to unmanned systems to enhance UAS awareness and mishap reporting requirements. Even if you are an Aviator not directly involved in UAS operations, aviation is our business as technical and tactical experts in the employment of aviation assets; and it is highly possible that you will recognize commonality in processes, lessons, and trends highlighted in this edition are similar to those in manned aviation.

Until next month, fly safe!
LTC Christopher Prather USACR/SC Aviation Director
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UAS Mishap Reporting Critical To Mission Success

Chief Warrant Officer 3 Brett Horner
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Aviation Directorate
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There's a story behind each UAS mishap, a story that could help prevent another one like it from happening. Our job as Army aviators is to get the facts from mishaps to the people who can take action and preserve our combat resources.

The Army's mishap investigation center, now the U.S. Army Combat Readiness/Safety Center at Fort Rucker, Ala., began as the Army Accident Review Board in 1954, and transitioned to the U.S. Army Board for Aviation Accident Research in 1957.

In 1972 it became the U.S. Army Agency for Aviation Safety (USAAAVS). The USAAAVS mission expanded to include accident prevention education, safety assistance visits, establishment of the Army aviation safety policy, the collection of Army aviation accident data, promotion of system safety, and support of selected aspects of the Army's ground safety program. In 1978 it became a field operating agency and assumed responsibility for both aviation and ground safety and was renamed the U.S. Army Safety Center. On Jan. 31, 2005, it became the more robust U.S. Army Combat Readiness/Safety Center with an expanded mission.

The USACR/Safety Center monitors, among other things, both manned and unmanned flight operations which involve mishaps. When an unmanned aircraft is lost due to a mishap, a sequence of events must take place to preserve and collect data needed for analysis. Completion of this process is essential to obtain the statistical data for, how often mishaps occur, how to develop trends, educate Soldiers and prevent history repeating itself.

After the inception of unmanned aircraft in the Army Military Intelligence community, Unmanned Aircraft Systems (UAS) were moved to the Army Aviation Branch in 2006. This was largely due to the drastic need for aviation oversight of training and standardization development, as well as compliance with Federal Aviation Administration (FAA) regulations and Army Aviation operations and regulations.

As the Army continues to advance technologically, and sophisticated weapon systems become an integral part of our arsenal, it is imperative for the Army to remain vigilant and safety aware. We cannot afford to "re-invent the wheel" with so many resources at our disposal. Thus, we must continue to educate, equip and advance the knowledge base of our evolving force.

UAS is a prime example of this advancing technology. When Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) began, the Army had very few active UAS airframes. However, over the course of two wars and UAS proving essential to full spectrum operations, unmanned aircraft (UA) multiplied within the Army at an unprecedented rate. A majority of the systems in operation today have come into the Army inventory over the last 12 years. For well over a decade, our Army has been at war leaving little time to grow a solid aviation foundation in standardization and safety.

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From 2001-present, the number of UAS mishaps reported in the Army database isn't an accurate representation. For those who have been in this community since the beginning, you probably will agree that the number available in the Risk Management Information System (RMIS) does not reflect actual losses incurred since UAS joined the Army's arsenal. This makes trending and statistical comparisons difficult.

Since the USACR/Safety Center is responsible for "accidental loss areas," how is this data obtained? The information comes from the units in the field when an Installation Accident Investigation (IAI) or Centralized Accident Investigation (CAI) is conducted. How can that data benefit commanders and units? Accident information is only as useful as the data collected and reports that are written and submitted through proper channels. This is how training deficiencies, standards failures, loss reports are generated and trends are developed. Utilization of the proper forms and submission of the data in accordance with Army regulation determines the value of data available for analysis. So, how do we get better? We start by ensuring the process is understood and what the reporting requirements are for each class of mishap. Additionally, understanding what to report and whom to report it to, is equally as critical.

Reporting Requirements AR 385-10 Chapter 3

You have had an mishap in your unit, what now? First, do you have an Army accident? *AR 385-10 Chapter 3-3 (a)-(e) defines an Army accident as:* an unplanned event or series of events, which result in occupational illness to Army military or Army civilian personnel, injury to on-duty Army civilian personnel, injury to Army military on-duty or off-duty, damage to Army property, or damage to public or private property and/or injury or illness to non-Army personnel caused by Army operations (the Army had a causal or contributing role in the accident).

You now have determined you have an Army accident. **Immediate** telephonic notification is required for Class A, B, and C mishaps (reference most current DA PAM 385-40 table 4-1). Begin by filling out the Worksheet for Telephonic Notification of Aviation Accident/Incident DA Form 7305. Once this form is complete, email to: accidentinformation@conus.army.mil or notify USACR/Safety Center by phone at DSN 558-2660/2593/3411 or COM (334) 255-2660/2593/3411. Program managers do not submit accident information to the USACR/Safety Center. So, it is crucial that this form is filled out and sent to the USACR/Safety Center by the unit. This form puts a "mark on the wall" and gives the USACR/Safety Center commander the information needed to determine which investigation (CAI or IAI) is appropriate given the circumstances. The DA Form 7305 should be as thorough as possible. If we are consistently having systemic malfunctions on a particular airframe, this develops the trend and that information needs to be distributed Army-wide to prevent further mishaps.

For class A, B, and C mishaps; abbreviated and full reports are due within 90 days for peacetime, and in combat, abbreviated reports are not to exceed 60 days and final reports are not to exceed 90 days. Additionally, utilization of the UAS Prep Guide will save you time and effort when mishaps occur.

Our Army is operating in a world of fiscal restraints. By reporting mishaps and allowing the system to work properly, we can head off systemic issues, training failures and standards failures that result in needless loss and expending funds on damaged aircraft that could better be used training the force.

Quality Training and Proper Readiness Level Progression

Sergeant First Class Christian Holderith
UAS Standardization Operator
Directorate of Evaluation and Standardization
U.S. Army Aviation Center of Excellence
Fort Rucker, Ala.

Quality training is the cornerstone to safe day-to-day operations of unmanned aircraft systems (UAS), and this begins during Readiness Level (RL) Progression. The purpose of readiness levels is to identify the training phase in which to perform assigned missions, while providing a logical progression of individual and crew training based on task and mission proficiency (TC 1-600, paragraph 2-15).

In accordance with (IAW) TC 1-600, unmanned aircraft crewmembers (UAC's) have 90 days to demonstrate proficiency in all base tasks, in all modes of flight, to progress from RL3 to RL2. UAC's also have 90 days to demonstrate proficiency in mission and additional tasks designated by the unit commander in order to progress from RL2 to RL1. UAC's demonstrate proficiency to an Instructor Operator (IO) or Standardization Operator (SO) during a Proficiency Flight Evaluation (PFE), conducted IAW the evaluation sequence (TC 1-600, paragraph 3-16 thru 3-20). During a majority of our assistance visits with units, we do not see evidence that the evaluation sequence is being executed properly. A lot of units fail to complete proper RL progression with UAC's for a number of reasons. Some of these reasons include failure to demonstrate proficiency in all modes of flight (D/N), training and evaluating mission and additional tasks with a UAC that is RL3, successful completion of the Local Area Orientation (LAO) flight prior to RL1 designation (TC 1-600, paragraph 2-32), and failure to demonstrate a working knowledge and understanding of the required academic topics as required by Phase 2 of the evaluation sequence (TC 1-600, paragraph 3-18). With these issues identified, the following corrective action needs to be applied in order to successfully complete RL Progression:

•UAC's must demonstrate proficiency in all base tasks in each mode of flight (day or night) required by the ATM and CTL for each task. The provision pertaining to the more demanding mode of flight does not apply (TC 1-600, paragraph 2-16). Units that conduct flight operations outside of special use airspace and have a restrictive COA which may prohibit or limit flights during either day or night, would need to request an extension or waiver to the portion of RL progression that is effected IAW AR 95-23, paragraph 4-2, Waivers to training requirements.

•Units are combining the training and evaluation of base, mission, and additional tasks. This is a clear violation of TC 1-600. UAC's are not authorized to perform mission tasks until RL2 designation, and we shouldn't expect our RL3 operators to be able to perform mission tasks until they can proficiently perform all base tasks.

•The LAO needs to be completed prior to RL1 designation. The LAO can be completed during RL progression, and once complete, a required DA Form 7122 entry needs to be made recording the completion of the LAO.

•During our assist visits, over 80 percent of all FORSCOM units UAC's fail academic evaluations. This directly reflects of the lack of an aggressive academic training program. A majority of the

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units that do have an academic program rely on the SO/IO to train these academics, instead of utilizing their Unit Trainers (UT) for all non-emergency procedure academic topics. A TTP that has been successfully used is to designate select UAC's as a UT (AR 95-23, paragraph 4-24) and task them to train academic topics. This TTP would assist in lessoning the training burden solely and inadvertently placed on the SO/IO to train all academic topics. It also assists in identifying potential IO candidates.

An RL1 UAS operator is a combat multiplier by which there is no match, but when a UAS operator is not properly progressed, the unit's combat effectiveness and readiness are degraded. We exist to support the units on the ground and we must provide the most effective and efficient support capable within the limits of our aircraft. A degradation of readiness will directly result in lessened effectiveness and efficiency of support to the ground unit. With life and death decisions being made from the information that we provide, we want to ensure that our training and qualifications are beyond reproach when it comes to retaining the trust of our supported commanders.

--SFC Christian Holderith, DES UAS Standardization Operator, may be contacted at (334) 255-3475, DSN 558.

WE NEED YOUR INPUT

Complete the online Flightfax Reader Survey

The online version of Flightfax is two years old this month. In an effort to keep current with the field, we need your feedback. Please take a few minutes and complete the Flightfax Reader Survey located at:

https://tools.safety.army.mil/Survey/TakeSurvey.aspx?SurveyID=8lKJ7p8 (You may have to copy and paste into your browser).

The collected demographics are fine, but the key question **- "How can we improve Flightfax or make it more relevant to your needs?"** - is the information we're seeking.

If you can't do the online survey, feel free to respond with your input via email to the Aviation Directorate, U.S. Army Combat Readiness/Safety Center:

usarmy.rucker.hqda-secarmy.mbx.safe-flightfax@mail.mil

UAS Accident Investigation Shortfalls CW3 Brett Horner

When I was a young enlisted man, my aircraft accident knowledge was pretty limited. I knew I would have to "pee and bleed" and I would have to go through something equivalent to a Law and Order interrogation to find out what happened, and how I was involved. During the course of my assignment at the U.S. Army Combat Readiness/Safety Center, I have learned more than I ever imagined. Let me share it with you.

My very short sided view of the process limited my full understanding of the importance and impact accident investigations have on our Soldiers, and the systems we operate. Everyone tends to balk at the thought of safety, and we have all heard stories of "Safety Nazis" within our organizations. What about the four-day weekend "safety talk?" You get all the right stuff for the weekend, right? Well, for me, I could pretty much recite this safety brief by about week two in the Army. Seeing members of my past units dive for cover as the safety officer entered the room was pretty hysterical as well. However, seeing safety from this level has taught me a tremendous amount about being a leader, but also the lack of humor behind the very topic of safety within our ranks. It can deter needless loss of life, equipment and improve operational effectiveness. It is a force multiplier and deserves a place of value within our organizations.

I have had the privilege of serving on Centralized Accident Investigations (CAI) and have reviewed countless Installation Accident Investigations (IAI) for unmanned aircraft (UA) mishaps. The same errors are continually identified during accident reviews. They include "our forms are horrible and ineffective. They don't even coincide with unmanned operations." Okay, fair enough. Our pleas have not fallen on deaf ears. The forms need some work, and I can assure you there are professionals working diligently to get these forms revised and have them relevant to unmanned operations. That being said, we (as a community) can get better by understanding the process, enforcing standards, and digging into the appropriate Army Regulations (AR) or Department of the Army Pamphlet (DA PAM) where the standards are located.

Devoting 10 hours a day, CAI's take anywhere from 12-15 days to complete from the time you hit the ground to the command out-brief. When the investigation is concluded, the board will be waiting on a few loose ends (Bio-chemical testing results and Corpus Christi Army Depot (C-CAD) results).

DA Form 2397U

Your best friends when it comes to the DA Form 2397U is DA PAM 385-40 and the UAS Prep Guide . Examples for completing this form are located in DA PAM 385-40 para 3-37, pg. 127. Not only does it give you an example, it will prohibit minor errors on the form when used, such as:

Block 11d (2)(4)(5)/e (2)(4)(7)c - Inputting the name, rank and position of personnel, when the form only requires the rank and position.

11f(1) Digital Source Collection installed – yes, and state what source was utilized (Ace Box II, GCS, etc.) Input the primary source from where you downloaded the digital data.

Block 12 – Summary should be a summary of the accident consistent with the findings and recommendations provided to the command. This is not the initial summary provided at the onset of the accident. Information will change as data is collected and analyzed.

Block 19(9) – Lab tests are required for ALL Class A, B and C mishaps. This block is rarely checked and test results are rarely sent with the final report. See AR 385-10 3-16 (3).

Findings and Recommendations – DA PAM 385-40, paragraph 3–5, table 3–1, and para 3–24 give the format for writing Findings and Recommendations.

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Accident Scene Photos

Photos are an important element of the investigation process. It assists the investigators with detailing crash data, aircraft attitude on impact, pre-crash and post crash fire data. the list goes on and on. It also tells the story to someone who wasn't involved in the accident or investigation. The standards for photos taken are contained in DA PAM 385-40, chap 2-5, (4)-(b), pg. 26, which states: All photographs used in the report must be numbered and captioned. Captions should explain in detail what the picture is supposed to show. Captions will include type equipment, date of the accident, and location of the accident.

Most files we received contain photos. However, there is no way for personnel auditing the file to be certain they pertain to the accident in review, unless they are properly marked.

Materiel Failures and Product Quality Deficiency Reports (PQDR)

Material failures can occur at any stage in the lifecycle of equipment. Sometimes these failures are caught before an accident occurs. For example, an engine with less than 50 hours of operation is discovered on a post flight inspection to have metal shavings in the engine oil fins. Do we just replace the engine, write in the log book, and call it good? I should hope not. We should be submitting the reports required (PQDR) to notify the proper channels of a defective part or component received. This is important because it could prevent mishaps from happening at other units operating the same platform. It's possible that parts were sent into the field with the same lot number and are failing at a high rate. Submission of PQDR's is equally as important when a part has failed and is the cause of the incident.

Sometimes, mishaps happen as a result of materiel failure. If you have an accident and the causal factor is determined (by the board) to be a material failure, this requires the submission of a PQDR, see DA PAM 750-8, chap. 10 and AR 702-7-1 for information on submitting this report.

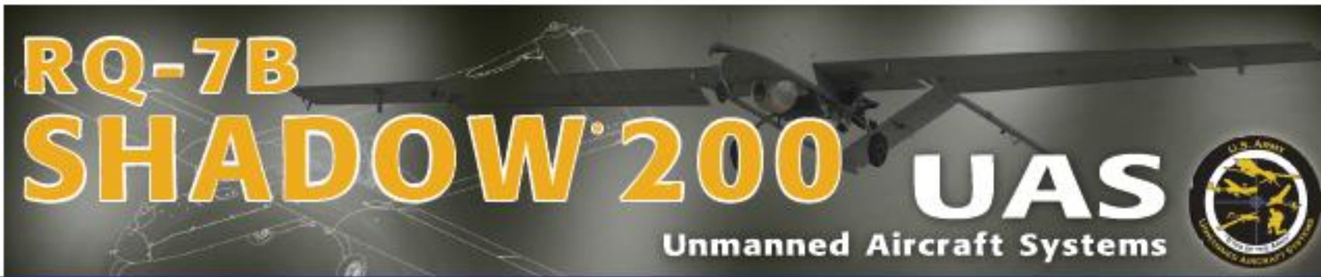
DA PAM 750-8 states: *Anyone finding quality deficiencies in Government-owned materiel is required by this pamphlet, DA Pamphlet 738–751, and AR 702–7 (DLAD/DLAI 4455.24) to report the defects to the appropriate Military Service Screening Point for investigation and resolution. For situations where equipment becomes dangerous to people, Ground Precautionary Messages and Safety of Use Messages should be issued in accordance with AR 750–6. Submit an SF 368 via Electronic Deficiency Reporting System (https://aeps.ria.army.mil), mail, e-mail, or fax to the military service/agency screening point for that item (see table 10–1).*

To get a full understanding of the multi-use SF 368, refer to DA Pam 750-8, Chap 10, (1)-(9). Submission of this form is the responsibility of the unit maintenance NCOIC. A Field Service Representative (FSR) is not required to, nor is it their responsibility, to submit this form. If an accident has occurred, one of the board members will fill it out. However, they may require the assistance of the maintenance NCOIC to access all the data required to complete the form. PQDR is a means of identifying possible trends, as well as, recouping cost when parts fail.

Accident investigations are one of the many ways the Army is able to identify trends and disseminate findings and recommendations to the field. It saves lives, resources and prevents further accidents. The impact of an investigation will be determined by the care given to documenting the information, the enthusiasm put forth to obtain the causal factors and desire to prevent future accidents.

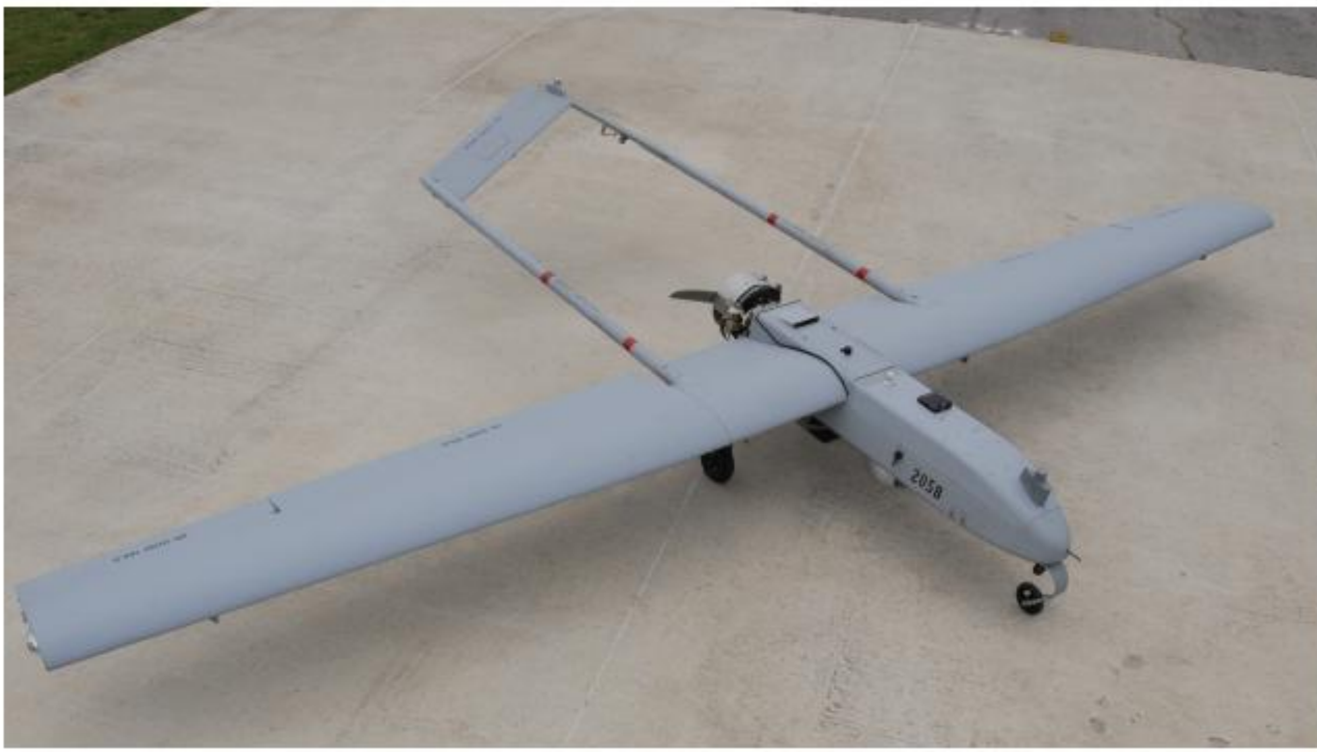
CW3 Brett Horner is a UAS Accident Advisor assigned to the Aviation Directorate, U.S. Army Combat Readiness/Safety Center, Fort Rucker, Ala.

Know your unmanned aircraft



The RQ-7B Shadow® 200 Unmanned Aircraft System (UAS) provides Maneuver Commanders a near real-time, highly accurate, sustainable capability for over-the-horizon Reconnaisance, Surveillance, Target Acquisition (RSTA).

Shadow® provides 12 hours of continuous operations on station within a 24-hour period, with surge to 18 hours and provides Electro-optical, Infra-red, Laser Pointer/Illuminator, and Laser Designation



Wing Span	Max Gross Weight	Range	Airspeed	Altitude	Endurance	Payloads	Launch/ Recovery
20.4 ft	460 lbs	125 km	65 kts loiter 110 kts dash 70 kts cruise	>15,000 ft msl	9 hrs @ 50 km	EO/IR, Laser Pointer, Laser Designator Communications Relay Package	100 m x 50 m Area

Manuever Commander's Tactical Unmanned Aircraft System

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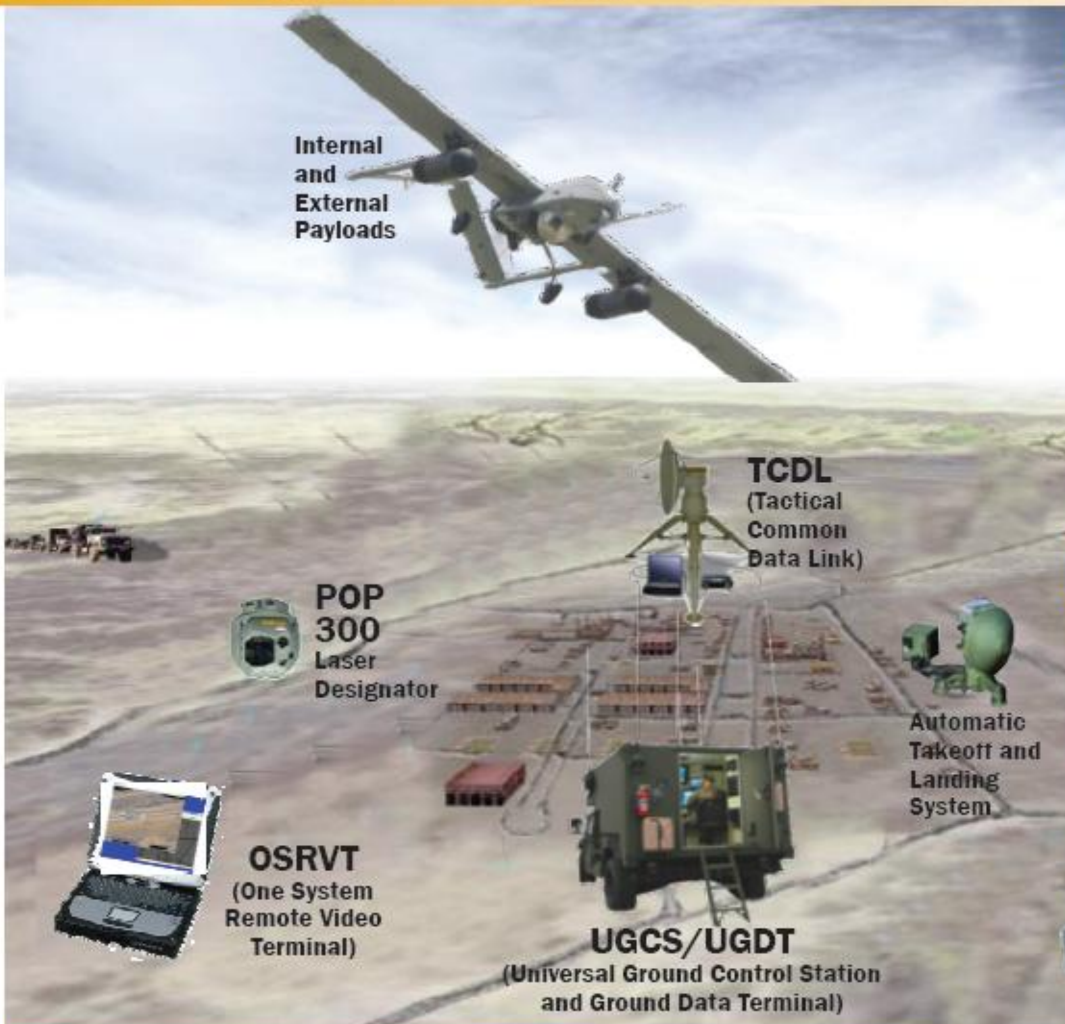
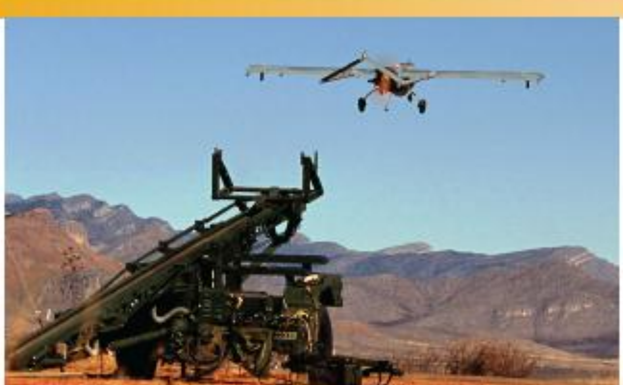
Shadow 200 System Description



Basic Platoon Maneuver TUAS System	
Ground Control Station	2
Air Vehicle	4
Remote Video Terminal & Antenna	4
Portable Ground Control Station & Data Terminal	1
Air Vehicle Transport +1 Trailer & Launcher	2
Personnel/Equipment Transport & Trailer	2
35D (Platoon Leader)	1
UAV Warrant Officer (*150U)	1
Platoon Sergeant (*15W)	1
Air Vehicle Operator (*15W)	12
Maintenance Section	
Maintenance Section Multifunctional	1
Personnel/Equipment Transport	1
UAS Repairer (15E)	7



System Characteristics

- Hydraulic launcher on standard HMMWV trailer
- One-man deployable in less than 10 minutes
- System transportable on six C-130 aircraft
- Early entry capability with three C-130 aircraft
- Tactical Automatic Landing System (TALS)
- Compatible with Army's Battle Command System

Class A – C Mishap Tables

	Manned Aircraft Class A – C Mishap Table									as of 14 Jun 13
	Month	FY 12					FY 13			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities
1st Qtr	October	2	2	6	1		1	0	7	0
	November	0	1	13	0		0	1	3	0
	December	2	2	6	4		2	1	0	0
2nd Qtr	January	2	0	11	0		0	0	5	0
	February	2	1	6	0		0	0	2	0
	March	1	2	12	0		3	1	5	7
3rd Qtr	April	2	1	6	4		1	1	6	2
	May	1	0	4	0		0	0	4	0
	June	1	0	2	0		1		1	
4th Qtr	July	3	3	9	1					
	August	2	5	5	0					
	September	2	0	2	2					
	Total for Year	20	17	82	12	Year to Date	8	4	33	9

UAS Class A – C Mishap Table									as of 14 Jun 13
	FY 12 UAS Mishaps					FY 13 UAS Mishaps			
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total
MQ-1	5	1		6	W/GE	2	1	0	3
MQ-5	1		3	4	Hunter	2	0	3	5
RQ-7		5	20	25	Shadow	0	1	8	9
RQ-11					Raven				
RQ-20			4	4	Puma	0	0	4	4
YMQ-18									
SUAV			1	1	SUAV				
Aerostat	2	5		7	Aerostat				
Total for Year	8	11	28	47	Year to Date	4	2	15	21

Human Factors in UAV Accidents

Patricia LeDuc, USAARL and Sharon Manning, USAABSO Aug 04 Flightfax

Editor's Note: The following article is an excerpt from the U.S. Army Medical Department Journal. The full report may be found online at http://www.usaarl.army.mil/TechReports/2004-11.PDF

The expanded use of unmanned aerial vehicles (UAVs) in Afghanistan and Iraq has brought them into the public spotlight. Advocates for UAVs cite a number of distinct advantages over manned aircraft. These advantages include:

- Reduced or eliminated human loss.
- Lowered initial system development costs.
- Lowered replacement costs.
- Lowered operator training investment.
- Expanded mission time.
- Reduced detection signature and vulnerability.
- The ability to operate in nuclear, biological, and chemical environments.
- Reduced peacetime support and maintenance costs.

The Army currently fields two major UAV systems: The RQ-7 Shadow and the RQ-5 Hunter. The Shadow is a small (9 feet in length), lightweight (330 pounds), short-range surveillance UAV used by ground commanders for day and night reconnaissance, surveillance, target acquisition, and battle damage assessment. Capable of operating at altitudes of 14,000 feet, the Shadow can carry instrument payloads of up to 60 pounds. The Hunter is a twin-engine, short-range, tactical UAV that provides capability for an increased payload (200 pounds) and endurance period (up to 12 hours). It weighs 1,600 pounds and has a 29-foot wingspan.

While UAVs offer multiple advantages, they do have some disadvantages. Many are low flying and have slow ground speeds, making them easy targets for enemy ground forces. Remotely piloted UAVs require a complex and highly reliable communication link to the control station, and operators must make decisions based on sometimes-limited sensor information accompanied by a built-in signal delay. Automating some functions within a UAV control system may overcome certain remote operation disadvantages, but removing the man from the cockpit reduces the ability to make rapid decisions with maximum situational awareness.

Naturally, the increase in UAV use has been accompanied by an increased frequency of accidents. As mechanical failures decrease with the maturation of UAV technology, human error will account for a higher percentage of accidents. Knowledge of the human-related causal factors in UAV accidents can be used to suggest improvements in areas such as current flight training methods, crew coordination measures, and operational standards. The predominant means of investigating the causal role of human error in all accidents is the analysis of post-accident data. From Fiscal Year 1995 to 2003, a total of 56 UAV accidents were recorded. The application of both the Human Factors Accident Classification System (HFACS) and the DA Pam 385-40 approach identified 18 accidents (32 percent) as involving human error. While no single factor was responsible for all UAV accidents, both methods of analysis identified individual unsafe acts or failures as the most common human-related causal factor category (present in 61 percent of the 18 human error-related accidents).

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Within the major HFACS category of “unsafe acts,” four subcategories were identified: skill-based errors, decision errors, perceptual errors, and violations. The most common unsafe act was a decision error, present in 11 percent of all UAV accidents and 33 percent of all human error UAV accidents. Examples of decision errors include (a) when the external pilot hurried turns using steep angles of bank and prevented a proper climb rate, resulting in a crash; and (b) when the wrong response to an emergency situation was made by commanding idle power after the arresting hook caught on the arresting cable. The single accident categorized as “preconditions for unsafe acts” was further identified as a crew resource management issue.

Based on the DA Pam 385-40 classifications, the most represented Army failure was “individual failure” (20 percent). The second most prevalent failure category was “standards failure” (14 percent). When just the 18 accidents involving human error are considered, individual failure was present in 61 percent, and standards failure was present in 44 percent. “Leader failure,” “training failure,” and “support failure” were present in 33 percent, 22 percent, and 6 percent of the human error accidents, respectively.

Incidents of individual failure included (a) the operator misjudged wind conditions during landing; and (b) crewmembers overlooked an improperly set switch on the control box. Incidents of leader failure included (a) a crewmember who did not have a current certification of qualification was assigned as an instructor pilot; and (b) leadership failed to provide oversight of placing the UAV in a tent and having the tent properly secured. Incidents of training failure included (a) training was not provided to the UAV operator on effects of wind; and (b) training was not provided on single engine failure emergency procedures. There was only one incident of support failure, which involved a contractor that did not take appropriate maintenance actions even though information was available. Incidents of standards failure included (a) written checklist procedures for control transfers were not established in the technical manual; and (b) there was no written guidance on inspection and replacement criteria for the clutch assembly.

As seen in virtually all types of accidents, human error plays a significant role in UAV damage and loss. Post-accident data analysis can provide a starting point for the design, examination, and adoption of appropriate countermeasures. While no single human factor was responsible for all accidents, these findings suggest there is a need to further develop and refine UAV training and safety programs that target individual mistakes. In demonstrating that human error plays a significant role in UAV accidents—and by identifying the type and prevalence rate of these errors—this study shows the need for emphasis on developing and implementing countermeasures that target human decision making error.

—At the time of this writing, Dr. LeDuc was a Research Psychologist for USAARL’s Aircrew Health and Performance Division, Fort Rucker, Ala. She is currently the Human Factors Director at the U.S. Army Combat Readiness/Safety Center. Ms. Manning was assigned as a Safety and Occupational Health Specialist at the U.S. Army Aviation Branch Safety Office, Fort Rucker, AL.

Selected Aircraft Mishap Briefs

Information based on Preliminary reports of aircraft mishaps reported in May 2013.

Cargo helicopters

CH-47 

-D series. Aircraft experienced failure of the right rear wheel during post-landing taxi to parking. (Class C)

Utility helicopters

UH-60 

-L series. Aircraft experienced a #2 engine hot start. IVHMS data showed TGT greater than 950 degrees C in excess of 15 seconds, peaking at 996 degrees C. Engine replacement required. (Class C)

Fixed wing aircraft

C-12 

-U series. On post-flight, damage to the #1 propeller blade of the #1 engine found following an IFR flight.

-V series. Aircraft was on downwind when it struck a bird resulting in damage to the left side of the tail stabilator.

> **"You cannot be disciplined in great things and undisciplined in small things"**
> **GEN George S. Patton Jr., May 1941**

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