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Online Report of Army Aircraft Mishaps

Aviation safety culture: informed and accountable

BG TIMOTHY J. EDENS and LTC CHRISTOPHER PRATHER
U.S. Army Combat Readiness/Safety Center
Fort Rucker, Ala.

Historically, Army flying hours decrease following withdrawal from conflict (figure 1). As we move forward and draw down from more than 11 years of overseas contingency operations, home station resources will be limited due to reduced flying hour programs. Aviation's hands-on experience informs us that as hours decline, proficiency drops. Together, lags in proficiency and overconfidence from combat experience have, at times, had a devastating effect and resulted in catastrophic accidents at home station. To reverse this historical trend in our current drawdown environment, it is imperative that we build a proactive and preventive safety culture in our formations.

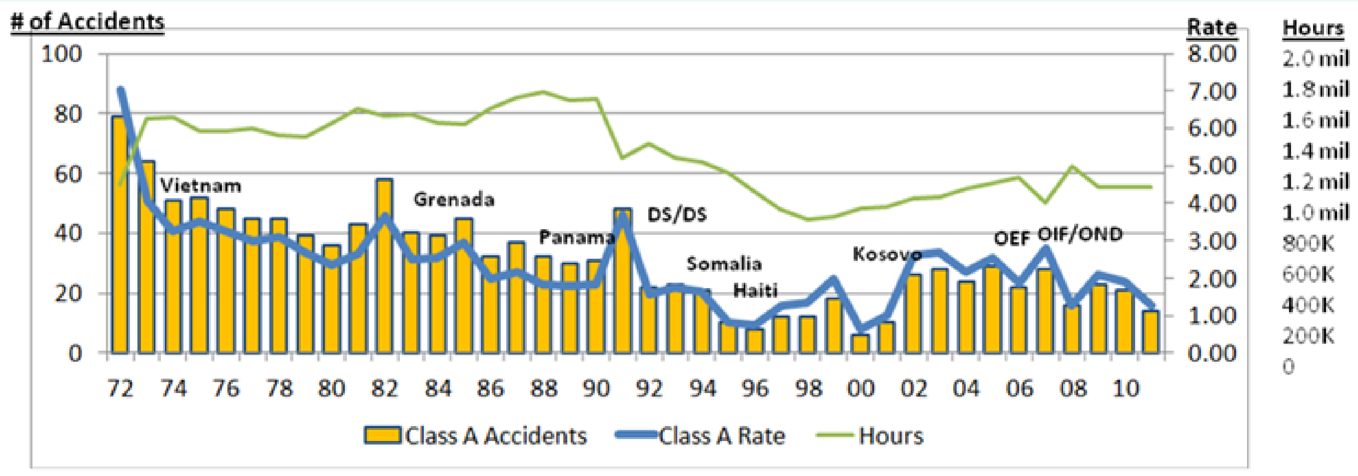

Figure 1. Accident rates and flying hours in context of historical conflicts

Getting to a proactive safety culture is not as simple as making a command decision to reduce accidents and fatalities by an arbitrary number. This technique does not make a workable goal or create an environment where Soldiers buy in to safety through their own participation in risk management. However, safety metrics — when properly developed and managed through effective reporting — can be an important part of your unit's safety culture and provide the incentive and inspiration to meet your risk management goals. Metrics can help you achieve a proactive safety culture in a resource-constrained environment if you (1) stay risk informed, as opposed to risk averse, and (2) establish effective accountability.

Being "risk informed" is often easier said than executed. There is no question that good leaders immediately implement control measures to mitigate risk; the challenge is identifying it early

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enough to prevent the next accident. During the second and third quarters of fiscal 2012, the USACR/Safety Center teamed with a tactical combat aviation brigade to test the Safety Awareness Program-Aviation, an anonymous hazard identification and reporting initiative. This demonstration validated the hypothesis that Soldiers are the most effective means for identifying hazards, and additionally provided valuable lessons learned for establishing hazard reporting programs within Army Aviation. Here is one conclusion that needs little explanation: If Soldiers perceive their reports are treated fairly and lead to immediate and tangible changes in command climate and safety programs, their willingness to report hazards increases exponentially.

The SAP-A demonstration also revealed there is no better predictor of future safety performance than the past. The insurance industry uses a predictive model to determine risk; for example, if a driver receives a speeding ticket, he or she could see an immediate increase in premiums. We know from experience that in most cases the ticket was far from the first incidence of speeding (rather, it was the first time the driver was caught), and the insurance company adjusts rates based on the likelihood of future risk. While the model is certainly not perfect, it is effective. Similarly, data from several thousand anonymous SAP-A reports showed that observed aviation hazard incidents are rarely the first of their kind. Much of the time, indications of deficient training and behavior, as manifested in hazards and incidents, are prevalent prior to an accident.

We are required by regulation to have a detailed process for determining the causes of accidents, which we accomplish through careful investigation. We do not have to wait for a catastrophic event, however, to discern the hazards. Simply looking over our shoulders to learn the pattern of past accidents, coupled with knowledge of past performance and comprehensive hazard reporting, allows us to see and act on emerging patterns of risk.

Effective accountability and hazard communication are critical in implementing a proactive safety culture. As Army Aviators, we have progressed over the years to view mishaps as failures of risk management, not meaningless and uncontrollable events. People and organizations are behind these failures, and this is where we can begin to fix accountability. We must remember, though, that holding people accountable and laying blame are two quite different things. While leaders must never tolerate regulatory or procedural violations, we would do well to remember that threats of punishment do not deter people from making errors, but could keep them from reporting hazards.

Again, safety metrics should be about accountability, not simply numbers. In the end, a proactive and predictive aviation safety program results in an organizational metric that recognizes the importance of dealing with the incidents its people reports, not how many it has or has not experienced. Active and involved leaders who listen to their Soldiers will keep our aircrews and those they support safe!

BG Edens is the director of Army Safety and commanding general, U.S. Army Combat Readiness/Safety Center. LTC Prather is the Aviation Director, USACR/Safety Center. *This article first appeared in the March/April 2013 issue of ARMY AVIATION - the official journal of the Army Aviation Association of America (AAAA).*

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Mitigating the Risk for Night Test Flights

CW5 Charles Miller
Directorate of Evaluation and Standardization
U.S. Army Aviation Center of Excellence
Fort Rucker, Ala.
Directorate ME

The combination of threat and high operational tempo (OPTEMPO) has resulted in the necessity of night Maintenance Test Flights (MTF) for many deployed units. The night MTF is generally a more risky event than a day MTF and should only be performed when proper risk mitigation procedures are in place. In order to properly mitigate the risk for night MTFs, commanders must determine if the MTF needs to be done and ensure only a trained and qualified Maintenance Test Pilot (MP) designated in night tasks is performing a night MTF.

Many factors must be considered in the determination for conducting night MTFs. Factors such as: threat, environmental conditions and aircraft availability should be considered. Commanders may decide the assumption of risk is too high and may mandate the MTF being conducted during the day. If it is determined the MTF must be accomplished at night, the commander can mitigate risk by evaluating necessary tasks required verses tasks that can be deferred, and allow only the completion of those tasks needed to bring the aircraft to a mission capable status. Whenever possible, MTFs should be conducted aided using NVD as a risk mitigation instead of flying night unaided. The commander, Standardization Instructor Pilot (SP) and Maintenance Test Pilot Evaluator (ME) must develop a night MTF program for inclusion in the unit SOP. The program for night MTFs should include training, evaluation and briefing requirements that always include the ME.

The unit's ME is responsible for training and evaluating MPs for all MTF tasks. MPs will be trained in night MTF tasks IAW the Aircrew Training Manual (ATM). Upon completion of training, iterations will be tailored based on individual proficiency for tasks selected by the commander in the required night/Night Vision Device (NVD) modes. If more than 12 months have elapsed since a task was completed in the night/NVD mode, MPs must be evaluated by an ME.

The process of integrating night MTF training into the commander's Aircrew Training Program (ATP) should occur during the unit's AFORGEN training cycle so MPs are trained and current in night MTF tasks. Commander's must ensure only experienced MPs are performing night MTFs and ensure crew selection includes task complexity and environmental factors are considered.

Many 4000 series tasks and MTF tasks require the MPs attention to be focused inside the cockpit while performing maintenance checks. When MPs are determining the aircraft airworthiness, an inherent risk is assumed in regards to the possibility of

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maintenance malfunctions occurring and the resultant Emergency Procedure (EP) being performed at night. Commanders should ensure only Fully Mission Capable (FMC) aircraft are used during night MTF training to reduce risk.

Night MTF training can be as simple as a Proficiency Flight Evaluation (PFE) in designated seat positions for experienced MPs or a series of training flights for inexperienced MPs. Upon completion of night MTF training, the individual's DA FORM 7120 series must be annotated to properly reflect the training to include authorized tasks, iterations, modes, and evaluation requirements.

Night MTFs allow commanders to maximize the maintenance effort throughout a 24 hour period. However, commanders must determine if the gain is worth the risk for night MTFs based on mission requirements and the experience of assigned MPs. Night MTFs require a detailed MP training program and a thorough risk mitigation process to help ensure safe operations.

--CW5 Charles Miller, DES ME, may be contacted at (334) 255-1572, DSN 558.

Flight Surgeon Philosophy (17 Nov 1976 Flightfax)

The following was extracted from the flight surgeon's analysis and recommendations in a UH-1H accident report. The aircraft was destroyed as a result of an attempted pinnacle landing over gross weight (computed 9,184 pounds) for the 6,405-foot density altitude (DA) existing at the time.

"If God had intended man to fly, he would have given him wings," seems to be the moral of this accident. Man, however, did not listen to these words of wisdom and for the past 60-odd years has been merrily flying through the skies on wings of his own design and manufacture. At times, these have served him well and at times, they have not.

How often have we seen the osprey unable to lift off the water with its catch due to insufficient lift from its powerful wings? Or seen a hawk strike in midair and then sink to the earth with its prey, its new gross weight above its capability to stay aloft? The bird's usual reaction when this happens is to release its meal and search for smaller game. This is not based on cowardice on the mighty hawk's part, but rather on a realistic instinctive appraisal of the DA, gross weight, aerodynamics, and the expected consequences of being dragged underwater or impacting with the ground at other than zero airspeed.

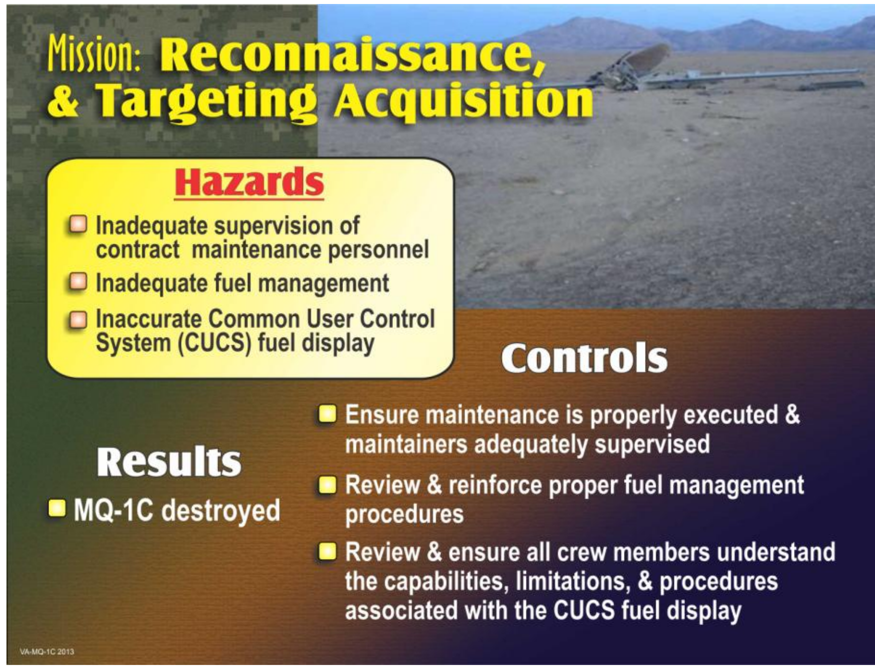
Man on the other hand, has no such God-given instincts to help guide him safely through the skies. He must rely on his acquired knowledge of the abilities of his man-made wings and on his unique asset of rational thought.

In this accident, the aircraft was loaded without supervision by the crew. The crew did not even know the exact number of passengers or the weight of the cargo aboard. As a result, the ship was over gross at a high DA and man, with his man-made wings, again went the way of Daedalus (more specifically, his son Icarus). Until such time as all pilots learn to use their ability to think and to apply their knowledge to the aircraft they fly, i.e., its limitations, characteristics and capabilities, we can expect that the wax of our wings will melt again under the hot sun of careless flying.

This accident should never have happened. Commanders and pilots must see to it that aircraft are flown within their limitations.

U.S. ARMY COMBAT READINESS/SAFETY CENTER

During a Reconnaissance, Surveillance, and Target Acquisition (RSTA) mission a MQ-1C Gray Eagle lost power due to fuel starvation. The MQ-1C subsequently lost altitude and crashed 2.5 NM from the intended landing area resulting in over $11,000,000 in damage. No personnel were injured.



The morning of the mission, the crew chief fueled the mission aircraft with 485 lbs of fuel (320 lbs, forward tank; 165 lbs aft tank). The aircrew received their mission briefing covering two Reconnaissance Surveillance and Target Acquisition missions. Weather briefed for the day was winds 130 at 03 knots, ceilings 20,000ft MSL. The first aircrew completed their pre-flight checks on the aircraft and in the OSGCS and began the mission. The controlling OSGCS experienced internal software problems compelling the crew to perform a control station transfer to another OSGCS, addressed the problem and transferred control of the MQ-1C back to the original OSGCS. The remainder of the first aircrew's shift was uneventful. The first crew completed a crew change over with nothing significant to report. The second crews shift was uneventful and they completed their crew change as scheduled. The third mission aircrew assumed control of the MQ-1C in cruise flight at 70 KIAS and at an altitude of 15,000 feet MSL 4.5 NM from the Forward Operating Base (FOB). The third aircrew identified a fuel imbalance between the forward and aft fuel tanks while completing the cruise flight checklist. The Aircraft Commander/Aircraft Operator (AC/AO) contacted a contract operator to assist with the emergency procedure for a fuel imbalance. While working through the fuel imbalance, the engine failed due to fuel starvation. The crew unsuccessfully attempted to restart the engine during the decent. The AC placed the MQ-1C into a decelerative attitude just prior to impact to minimize the damage to the air vehicle. The MQ-1C was destroyed when it struck the ground 2.5 NM from the FOB..

Findings:

- Maintenance personnel improperly installed the Low Pressure fuel Pump (LPP)
- Crewmembers failed to properly perform fuel management procedures

Recommendations:

- Ensure maintenance personnel perform all maintenance IAW the standards outlined in the OEM service bulletins and Army maintenance publications
- Conduct remedial training with all operators reviewing and reinforcing the specified and implied tasks associated with proper fuel management procedures to include fuel related emergency procedures
- Develop a software patch that enables accurate fuel data readings to be displayed on the CUCS fuel display

All information contained in this report is for accident prevention use only. Do no disseminate outside DOD without prior approval from the USACRC.

Access the full preliminary report on the CRC RMIS under Accident Overview Preliminary Accident Report

https://rmis.army.mil/rmis/asmis.main1 AKO Password and RMIS Permission required

Know your unmanned aircraft

The RQ-11B (Raven) is the Army's Program of Record for providing the lowest elements of the tactical force with dedicated aerial reconnaissance and surveillance. Raven's are currently operating in both Operation Iraqi Freedom and Operation Enduring Freedom. Raven fieldings have been underway since June 2006 to both active and reserve component Brigade Combat Teams and Armored Cavalry Regiments. In 2008, the Army's Basis of Issue Plans extended the Raven presence into Military Police, Engineer, and Field Artillery units. The Raven system is a critical element of the Intelligence, Surveillance, and Reconnaissance Surge effort. The Raven provides company level and below commanders an organic, on-demand, asset to develop situational awareness, enhance force protection, and secure routes, points, and areas. The Raven conducts surveillance during routine combat operations, much in the manner of an observation post or a screening element. As another asset of an integrated reconnaissance and surveillance plan, the Raven will respond to queuing from other sensor systems or provide queues to those sensors and reaction forces. A second ground control station provided with the system can serve as a remote video terminal for commanders. The Raven system is self-contained and rucksack portable. The Raven's data link was upgraded to a digital link in 2009, providing added security and reliability.

Wing Span	Air Vehicle Weight	Range	Airspeed	Operational Altitude	Max Altitude	Endurance	Payload	GCS/RVT	System Design	Data Link	Flight Modes
4.6 ft	4.4 lbs	10+ km (LOS)	Cruise- 30 mph Dash- 60 mph	300 ft AGL	10,500 ft MSL	90 min	Electro Optical front & side-look (2592x1944 pixels) Infrared Side Look (320x240 pixels) Infrared w/Laser Illuminator - 25 ft Spot at 500 ft AGL	Handheld (GCS & RVT are inter-changeable) Combined Weight- 9 lbs (13.9 lbs w/mission planning/ RSTA Laptop)	Modular, Kevlar composite, direct-drive electric motor, Li-Ion rechargeable batteries	Digital Data Link (DDL) using IP based protocol with 95 selectable channels-of which 16 may be used in an ops area-locked to specific air vehicle	Autono-mous or Manual

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Reconnaissance, Surveillance, and Target Acquisition (RSTA) kit: Facilitates mission planning, monitoring of mission progress, and observing, recording, and processing of video and still images derived from the Small Unmanned Aircraft Vehicle. The RSTA kit is fielded to units on the same basis as the Raven. The RSTA kit is employed by the SUAS operator as an optional element of their normal mission.

Visualization And Mission Planning Integrated Rehearsal Environment (VAMPIRE): an embedded simulation capability 100% hosted on the RSTA Kit allowing operators to train and rehearse operator and mission-level tasks. Closely integrated and correlated with FalconView™ flight planning software, VAMPIRE simulates operator tasks such as route and mission planning as well as in-flight tasks such as target tracking and reaction to emergency situations. VAMPIRE provides Soldiers with an enhanced ability to train on Raven systems anywhere, anytime.

The system provides day/night reconnaissance and surveillance capabilities to maneuver battalions, significantly enhancing force protection.




Project Manager
UAS Project Office
(SFAE-AV-UAS)
Redstone Arsenal, Alabama 35898

Class A – C Mishap Tables

	Manned Aircraft Class A – C Mishap Table									as of 22 May 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				2	
	June	1	0	2	0					
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	7	4	30	9

UAS Class A – C Mishap Table									as of 22 May 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

Watching and directing

9 Mar 1983 Flightfax

Webster defines supervision as “a critical watching and directing.” And aviation accidents continue to occur because supervisors are not critically “watching and directing.” Constant supervision and the elimination of substandard performance is the only way to keep aircrews from destroying aircraft and killing themselves and their passengers.

There are several levels of supervision – from the commander on down. No matter what level of supervision you are, the accident prevention program can never be successful unless you understand and believe in the need for integrating safe practices into all (even those so-called routine) phases of operations. By your attitude and example, you can generate the enthusiastic professional approach to flying which is necessary to accomplish the mission.

When supervisors fail to follow prescribed procedures **all of the time** and carefully select the best qualified crew for a mission, accidents such as the following occur:

- Before beginning aviation operations in support of a field training exercise, the unit commander did not insure that aircraft accident prevention procedures were established. Although an SOP existed for night tactical operations, the unit had no specific procedures for night operations or airfield operations as required by AR 95-5. A pre-exercise maneuver briefing was not conducted for the aviation personnel, and aircraft were operating from a confined area at night without sufficient visual aids to insure safe operations. As an AH-1 crew was preparing to take off from the confined area, the aircraft drifted right and the main rotor blades hit several trees.
- A UH-1 pilot had failed an examination on emergency procedures. No action was taken to provide the pilot with additional training or upgrade his knowledge of emergency procedures. Five months later, he reacted incorrectly to an in-flight emergency and crashed.
- An OH-58, flying at an estimated airspeed of 80 to 90 knots and 150 feet above the ground, hit and severed two wires. Control was lost and the aircraft crashed, killing the pilot and passenger. The terrain flight did not conform to FM 1-51. The detachment commander repeatedly emphasized the dominant consideration in mission performance was keeping the supported personnel happy at any cost. He was aware of and consented to the scheduling of his pilots on single-pilot missions when they had received no special or refresher training for the terrain involved in the mission support. Morale in the aviation detachment was low and behavior was undisciplined.
- An OH-6 pilot, taking off from a dusty LZ at night, lost visual reference. He hovered for about 20 seconds and then turned on his landing light, deteriorating his night vision. The helicopter drifted into trees and came to rest on its left side. This accident occurred at 2345. The pilot had slept only 5 ½ hours the night before, arising at 0330. The weather was extremely hot, much hotter than the pilot was accustomed to. The unit SOP did not address crew rest limits and there was no crew rest policy in effect. This led to a general lack of appreciation throughout the unit for the cumulative conditions that can lead to fatigue.
- A UH-1 pilot whose instrument qualification had expired 4 months before attempted flight in instrument meteorological conditions. He became disoriented and the aircraft crashed, killing one person and seriously injuring three others. The unit commander permitted the pilot to fly in

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weather which was conducive to inadvertent IMC.

We could go on and on with examples of supervisory error accidents, but these clearly give you an idea of the costly results of omissions by some supervisors.

Many aviators are willing to try to do more than they are capable of successfully accomplishing. New aviators, particularly those fresh out of flight school, are endowed with a great deal of vitality and curiosity, along with an adventurous spirit. There is nothing they can't do – particularly if they are encouraged to do it, have seen it done, or have been left to their own design while gaining experience. Commanders must know the capabilities and limitations of their aviators. An article on supervision in *AEROSPACE SAFETY* magazine says it best: "The authority to order a flight carries with it an absolute responsibility to supervise. The need for those who authorize flights to consider the flying experience, capabilities and qualifications of the aircrew can never be taken lightly. Whether the flight is to be advanced training by an exceptional pilot or a simple training exercise by an inexperienced student, the person ordering that flight must be certain that the task to be performed is not beyond the capability of the individual involved. If it is clear from the evidence of an accident investigation that an individual was being extended beyond his limits, how much sooner should this fact have been spotted – and remedied – by his supervisor?

"A particularly vulnerable phase in a pilot's career comes in the early stages of his first squadron tour when he is being trained to become a productive operational pilot. Individuals, even of apparent equal ability, progress at different rates; inexperienced pilots generally do not admit to their limitations, even if they know them, and some will have had exhibited potentially dangerous traits in their first months in the squadron. Crews need very close supervision if their self-confidence and skills are to be developed without at the same time overtaxing their ability and confirming bad habits. It is tragic that this care and protection all too frequently are found missing.

A few people may be able to supervise without much conscious effort, but most people have to work hard at it. Most supervisory tasks are governed by orders, regulations, standard procedures, and other instructions. And it's not enough just to insure the existence of these orders, regulations, etc. Supervisors must insure their aviators are familiar with and always abide by them.

Following are some things you, as a supervisor, can do to keep from being listed as a cause factor in an accident:

- As stated earlier, know those who work for you. Learn their personalities and character. Be alert to changes in the behavior of your aviators as they react to personal and professional stresses. Bad habits and disregard for established procedures and regulations often come to light when it is too late.
- Set a good example. "Do as I say, not as I do" won't work. If you don't demonstrate and believe safety, neither will your subordinates.
- If you're a commander, you must become actively involved with the daily flight operations of your unit.
- Insure you have a crew rest policy and it is strictly enforced.
- Tailor your unit training program to specific mission requirements. No two programs will necessarily be exactly alike.

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- Closely supervise aviators who have just had pilot-error accidents, whether Class As or Cs. The mistakes involved are often identical. Be firm with those aviators whose accidents were caused by carelessness, inattention, or a breakdown in professional discipline. Only positive corrective actions will prevent them from repeating.
- Be alert to the opinions of each pilot's ability, as expressed by other pilots. Listen to your safety officer.
- Establish an effective system for exposing operational hazards and then eliminate the hazards.
- Refuse to lend the stamp of approval to improper methods or procedures. Once you tolerate unsafe practices, your credibility is in jeopardy.
- Pair your most experienced aviators with your least experienced.
- Attend and participate in safety briefings and safety council meetings.

Remember that while mission accomplishment is paramount, the mission is never accomplished unless the aircrews and aircraft return safely to fly again another day.

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Selected Aircraft Mishap Briefs

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

Cargo helicopters

CH-47

-D series. Aircraft experienced an NR over-speed during initial XP training. (Class C)

-F Series. Aircraft sustained damage to the forward rotor system from FOD during run-up sequence. (Class C)

Utility helicopters

UH-60

-L Series. Aircraft stabilator contacted a tree during approach to a mountain LZ causing damage. (Class C)

-A Series. Aircraft stabilator contacted the ground on touchdown. Stabilator replaced. (Class C)

Attack helicopters

AH-64D

-Aircraft was trail in a flight of two when lead lost radio contact. Search revealed crash site. Two fatalities. (Class A)

Observation helicopters

OH-58D

-Aircraft experienced NP, NR and NG spike during manual throttle operation. Aircraft touched down hard. Component replacement required. (Class C)

-Aircraft touched down hard during a demonstrated FADEC manual approach. Damage reported to the skids and airframe. (Class B)

AH-6M

-Aircraft had a FADEC failure during a maintenance test flight. NR over-speed (115.3%) occurred during landing descent. (Class C)

Unmanned Aircraft Systems

RQ-7B

UA experienced a drop in RPM followed by a loss in altitude. Recovery chute was deploy and system was recovered with damage. (Class C)

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