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Half the Equation. Are We Missing the Point?

As aviation professionals piloting and crewing Army aircraft, we religiously complete the paperwork and assessments that contribute to the mission brief process. We ensure that all i's are dotted and t's are crossed. This process enables us to have a mutual understanding of the mission risk and helps us manage it through control implementation and information dissemination. Mission planning, briefing, and control implementation should produce safe operation and mission completion, but we may be missing the point.

Mission briefing is defined in AR 95-1 as part of the mission approval process. Throughout this process, the aircrew conducts detailed planning, risk assessment, and risk mitigation, which are later reviewed by the briefing officer. The briefing officer is responsible for ensuring the thorough evaluation and crew comprehension of the elements. Lastly, the final approval authority reviews the mission validity, planning and risk mitigation; then authorizes or disapproves the flight or operation IAW the commander's policy.

Upon receipt of mission approval, the crew departs. At this point, the mission should be completed as briefed, modified, or cancelled with return to base (RTB). The precise mission planning, approval process, and risk mitigation factors should remove the possibility of a mishap. If aircrews, briefing officials, and approval authority personnel are conducting operations IAW policy, how can mishaps still occur?

Real-time risk management

One possible explanation of mishap occurrence lies within the belief that the front-loading of risk management and in-depth planning at the appropriate leadership levels are the beginning and end of mishap prevention. As leaders, we look at the accident reports and findings and note the continued mishaps. As safety professionals, we review and analyze the reports and findings in order to find the point of failure. As an enterprise, we should look to the point of failure as a chance to affect change and prevent future mishaps.

In addition to analyzing reports and findings, we should consider exploring other options to affect change. The Bowtie Risk Management Methodology displays an example of how to identify cause, prevention barriers, and recovery barriers to preclude escalation or increase risk of mission failure and/or a mishap. *(See Figure Real-time risk management, page 2)*. Mission planning encompasses preparation, briefing, risk mitigation, approval, and execution. Perhaps we overlook the execution phase, which is the second part of the equation. For example, if inadvertent instrument

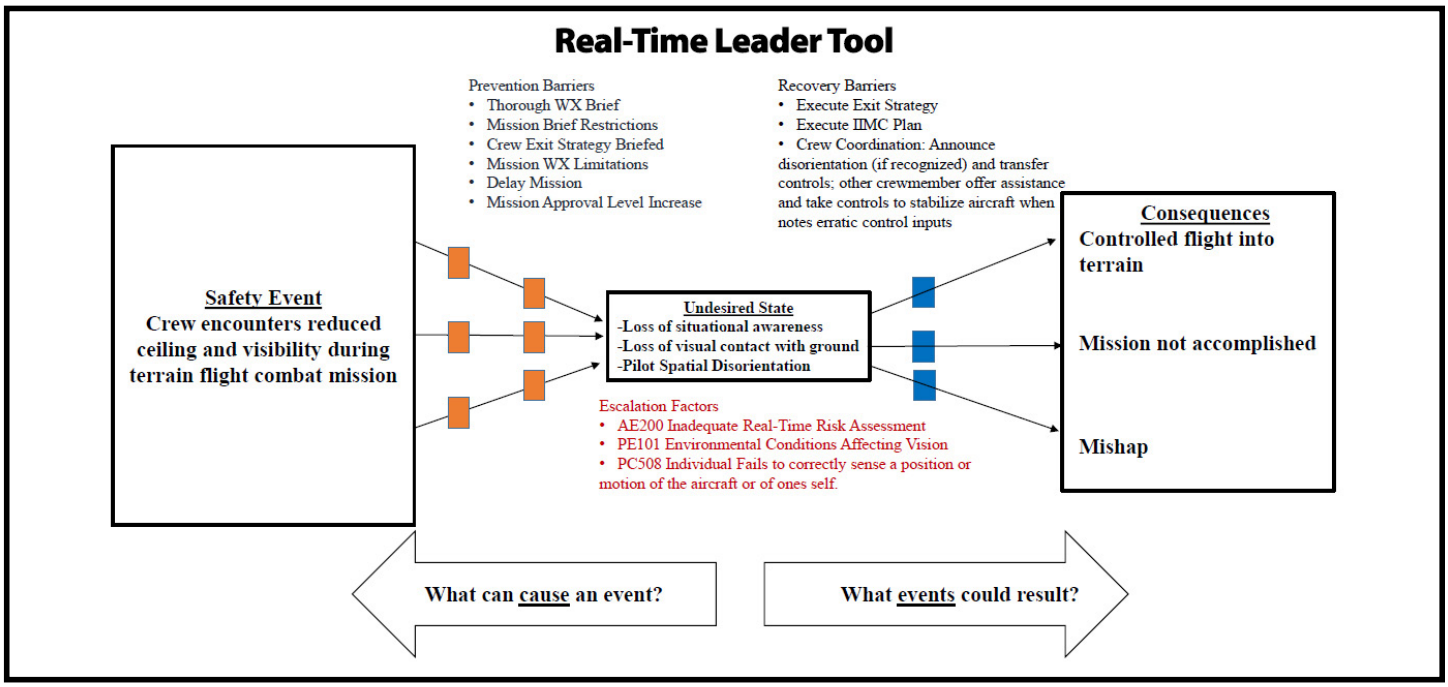

Figure: Real-time risk management

meteorological condition recoveries are briefed, why do crews fail to execute the procedure correctly? When the weather begins to deteriorate, why do aircrews continue to fly onward when they should return to a location and seek further guidance or simply RTB? If unit SOPs stipulate weather clearances and flight minimums, and these limits were briefed, why do aircrews continue forward?

The point being missed is that we need to manage training in aviation units so that crews continue to make mission risk decisions past the first half of the equation (planning, briefing, and approval process). Mission risk decision training can ingrain in aviators and crewmembers the ability to make better decisions while in the execution phase and understand that they have the authority to implement the risk control necessary to prevent the mishap that is possibly facing them, as in the example continuing ahead into poor weather. Within the second half of the equation (execution phase) risk management, leaders must convey that flight crews are fully supported should they need to abort, modify, or hold within a mission for risk reduction purposes. Furthermore, aviation crews want to complete the mission but should understand that not all circumstances faced in the execution portion will be 1,000 feet and 3 miles visibility with no enemy contact. Leaders must train crews individually and collectively so when executing missions and the crew/crews run into that situation where risk start to inch upward, and the AMC or PIC (single-ship operations) has that first thought of "were we briefed for this", they immediately reassess the risk and make the call to move back to a safe holding point where the AMC or PIC can contact higher for a re-brief with the current conditions or if necessary abort the mission and RTB.

Efficient training and continual reinforcement have ingrained planning, briefing, risk mitigation, and mission approval into aviation leader and aircrew actions. Further effort should be focused on the second half of the equation and emphasis should be placed on training and managing the real-time risk during mission execution. We need to ensure our crews are trained and prepared to conduct risk decisions while in mission profile. Crews must understand that continual risk mitigation, inclusive of aborting the mission, is a must. We must break away from the misconception that risk management and decision-making are automatic once the wheels or skids leave the ground, notwithstanding any planning conducted in the pre-execution risk management phase. To make the difference, this change requires a concerted effort by aviation leaders at all levels, just as transformative as the Army aviation change requiring mission briefings and risk assessments. ■

Directorate of Assessments and Prevention, Aviation Division

Problem-solving and Decision-making for Pilots

I am often asked what it takes to become a pilot. What are the airlines looking for when they hire pilots? What are the skills required to be great at your job? In an attempt to answer these questions, I will cover the eight core competencies a professional pilot is expected to master.

This week we are scratching the surface of a relatively new area in science, problem-solving and decision-making. As a professional pilot, one should be able to: "Accurately identify risks and resolve problems. A professional pilot should use the appropriate decision-making processes."

What exactly does this entail? Is there a correct way to handle the process of making a decision? Can you simply make a choice and go with it? People make decisions every day. What is so special about making a decision in the cockpit?

At this point, I assume that the answer to my string of rhetorical questions is emerging in your mind. The complex and potentially fast-changing environment, along the flight path of an airplane, calls for a systematic approach to problem-solving and decision-making.

Skillful communication also plays a role in the successful outcome of this process. In aviation circles, there is a joke that goes: "You know you are a pilot if you know way too many acronyms." We have acronyms to remember the type of equipment required for a flight, acronyms used as mental checklists when flying, and acronyms for a structured approach to decision-making. Some of the more common examples are:

- **The Pilot, Aircraft, enVironment, External pressures** (PAVE model)
- **The 5 P's** (Plan, Plane, Pilot, Passengers, Programming)
- **Diagnose, Options, Decide, Act/Assign, Review** (DODAR model)
- **Nature of the incident, Intention, Time available, Special instructions** (NITS model)

The use for these acronyms are slightly different, but they all relate to decision-making and problem-solving in one way or the other. Take a look at the PAVE model as an example:

The PAVE model

The PAVE model is derived from decades of contribution from the United States pilot community. It is explained in detail in the Risk Management Handbook published by the Federal Aviation Administration (FAA) and can be used as a memory aid to ensure all factors having a potential impact on your flight have been considered.

- **Pilot**
- **Airplane**
- **enVironment**
- **External pressures**

Pilot

As pilots, we must constantly evaluate our own physical and mental condition. Did I get enough sleep last night? Am I rested? Are there personal matters taking up my mental capacity? Am I getting sick?

If we feel like we are not fit to fly, it is vital that we inform our employer and stay out of the cockpit. A poorly rested pilot who is brewing on a cold will not be able to perform his or her duties properly. We owe

PILOT

Experience/Recency

Takeoffs/landings..... _____ in the last _____ days

Hours in make/model..... _____ in the last _____ days

Instrument approaches ..... _____ in the last _____ days
(simulated or actual)

Instrument flight hours..... _____ in the last _____ days
(simulated or actual)

Terrain and airspace .....familiar

Physical Condition

Sleep ..... _____ in the last 24 hours

Food and water.....in the last _____ hours

Alcohol.....None in the last _____ hours

Drugs or medication .....None in the last _____ hours

Stressful events .....None in the last _____ days

Illnesses.....None in the last _____ days

► _____

AIRCRAFT

Fuel Reserves (Cross-Country)

VFR Day..... _____ hours

Night..... _____ hours

IFR Day..... _____ hours

Night..... _____ hours

Experience In Type

Takeoffs/landings..... _____ in the last _____ days
in aircraft type

Aircraft Performance

Establish that you have additional performance available over that required. Consider the following:

- Gross weight
- Load distribution
- Density altitude
- Performance charts

Aircraft Equipment

Avionics.....familiar with equipment (including autopilot and GPS systems)

COM/NAV.....equipment appropriate to flight

Charts.....current

Clothing.....suitable for preflight and flight

Survival gear .....appropriate for flight/terrain

► _____

enVIRONMENT

Airport Conditions

Crosswind..... _____% of max POH

Runway length..... _____% more than POH

Weather

Reports and forecasts .....not more than _____ hours old

Icing conditions .....within aircraft/pilot capabilities

Weather For VFR

Ceiling Day..... _____ feet

Night..... _____ feet

Visibility Day..... _____ miles

Night..... _____ miles

Weather For IFR

Precision Approaches

Ceiling ..... _____ feet above min.

Visibility ..... _____ mile(s) above min.

Non-Precision Approaches

Ceiling ..... _____ feet above min.

Visibility ..... _____ mile(s) above min.

Missed Approaches

No more than..... _____ before diverting

Takeoff Minimums

Ceiling ..... _____ feet

Visibility ..... _____ mile(s)

► _____

it to our passengers and ourselves to take this part of our duty seriously. Pilots have a saying that goes, "If in doubt, there is no doubt." This means that if we are not sure about our own condition on the day of a flight, we will make the rational and safe decision to stay on the ground.

Airplane

There is a lot more to evaluating an airplane than making sure the wings are attached to the body. Technical malfunctions and problems are something we are highly alert for and well-trained to analyze and handle, on the ground and in the air. However, there are other elements to consider when it comes to this form of transportation. What kind of performance can we expect from our aircraft today? Do we have all the necessary equipment on board? Is the airplane airworthy and does it have all the necessary documentation?

We also need to consider the combination of the pilot and the aircraft. Is this a new aircraft type the pilot has not flown before? Does this model have different avionics compared to the ones the pilot normally operates? I could go on forever about the crucial and less crucial checks we need to perform before we depart on a flight. It is a good thing we have checklists that aid us in ensuring we don't miss anything.

enVironment

A great acronym is usually spelled using the first letters of the words they include; but every acronym can't be perfect, right? When we are taking the environment into consideration, it is not climate change we are discussing in the pre-departure briefing. Rather, it is the environment we will be operating in that day.

Is it going to be a fair weather flight with blue skies and fantastic weather along our route? Or are we in for a challenging day of battling tough winter conditions? There can also be a big difference between flying into smaller, less traffic-dense airports compared to arriving at larger airports, such as Heathrow or Schiphol. In addition, unforeseen events can arise that may put us into a holding pattern as we approach our destination. How will we deal with that situation? Will the plane have enough fuel on board to stay in the holding pattern? When

do we need to divert to our alternate destination? These complex decisions are usually just "another day at the office" for a pilot.

External pressures

During flight training and when working for an airline, pilots are exposed to these considerations several times a day. We gain experience and become more efficient at making safe decisions when a variety of factors are taken into consideration. We also spend vast amounts of classroom hours and recurrent training discussing what we refer to as human performance and limitations. We need to be acutely aware of how we work as human beings, such as how fatigue affects us and the interaction between physical and mental needs and well-being. Honest self-reflection is sometimes the greatest challenge we face as individuals, and it is truly one of the most complex skills to master.

Pressure to keep up with the time table, disgruntled passengers, and a fast-approaching storm are all great examples of the external pressures professional pilots have to handle.

To sum it up ...

The PAVE model, which I chose to use as an example, is one of many models available. In fact, most pilots rely on several models during a day at work. If you want to dive deeper into this highly interesting subject, I recommend checking out the FAA's Risk Management Handbook and doing a Google search for scholarly articles regarding the decision making process. Keep in mind that these models do not actually help us make the decisions. Decision-making takes knowledge, training, and experience. The models do provide a framework and structure we can use to ensure we are taking all factors into consideration. ■

Stein H. Mjåtveit
OSM Aviation Academy

EXTERNAL PRESSURES

Trip Planning

Allowance for delays..... _____ minutes

Diversion or Cancellation Alternate Plans

Notification of person(s) you are meeting

Passengers briefed on diversion or cancellation plans and alternatives

Modification or cancellation of car rental, restaurant, or hotel reservations

Arrangement of alternative transportation (airline, car, etc.)

Personal Equipment

Credit card and telephone numbers available for alternate plans

Appropriate clothing or personal needs (eye wear, medication…) in the event of an unexpected stay

► _____

_____

_____

_____

_____

_____

Importance of Trip

The more important the trip, the more tendency there is to compromise your personal minimums, and the more important it becomes to have alternate plans.

Your Personal Minimums Checklist—

- An easy-to-use, personal tool, tailored to your level of skill, knowledge, and ability
- Helps you control and manage risk by identifying even subtle risk factors
- Lets you fly with less stress and less risk

Practice "Conservatism Without Guilt"

Each item provides you with either a space to complete a personal minimum or a checklist item to think about. Spend some quiet time completing each blank and consider other items that apply to your personal minimums. Give yourself permission to choose higher minimums than those specified in the regulations, aircraft flight manuals, or other rules.

How To Use Your Checklist

Use this checklist just as you would one for your aircraft. Carry the checklist in your flight kit. Use it at home as you start planning a flight and again just before you make your final decision to fly.

Be wary if you have an item that's marginal in any single risk factor category. But if you have items in more than one category, you may be headed for trouble.

If you have marginal items in two or more risk factors/categories, don't go!

Periodically review and revise your checklist as your personal circumstances change, such as your proficiency, recency, or training. You should never make your minimums less restrictive unless a significant positive event has occurred. However, it is okay to make your minimums more restrictive at any time. Never make your minimums less restrictive when you are planning a specific flight, or else external pressures will influence you.

Have a fun and safe flight!

http://www.faa.gov/avr/news/ppams.htm

PERSONAL MINIMUMS CHECKLIST

Think…

PILOT
AIRCRAFT
EN**V**IRONMENT
EXTERNAL PRESSURES

Pilot: _____

Date Revised: _____

Reviewed with: _____
(if applicable)

FAA-P-8740-56
AFS-810(1996)

Mishap Review: AH-64D Wire Strike

While conducting a deliberate attack during combat training, the pilot in command (PC) of an AH-64D Apache helicopter had a breakdown in visual scan while on the controls. The PC was looking over his left shoulder and fixating on locating his wingman when he lost situational awareness of obstacles in his flight path. As a result, the aircraft struck wires and impacted the terrain, destroying the aircraft and causing minor injuries to crewmembers.

History

The AH-64 mission was broken into three phases. The first was the ingress flight from the tactical assembly area (TAA) to an attack by fire (ABF) position in the southeast corner of the approved airspace coordination area (ACA). The second segment was the deliberate attack at the ABF position, during which time they would identify and destroy enemy targets, utilizing a ridgeline east of the estimated enemy position. The third phase was the egress flight back to their TAA.

During execution of the attack mission, the mishap aircraft in Gun 1 position had a laser failure and moved to the southwest to identify and manually pass target information to Gun 2, who was staged along a ridgeline to the east. During maneuver along the valley area, Gun 1 decided to return to the ridgeline area due to visibility problems from dust generated while flying tactically. The Gun 1 PC directed the copilot gunner (CPG) to "stay inside" and maintain contact on enemy targets utilizing the target acquisition and designation system (TADS).

During this time, the PC was making a climbing clearing turn, looking over his left shoulder to gain visual contact with Gun 2. The PC rolled the aircraft level heading east and announced wires just prior to contacting the wires. Gun 1 contacted the high-voltage lines and completed a forced landing, impacting the ground.

Crew experience

The PC had 2,733.4 hours in mission design series (MDS). The pilot had 494.6 hours in MDS.

Commentary

When training in high operational tempo (optempo) environments, crews and staff become fatigued. Combat and combat training events apply high stress and fatigue to planning staffs and the crews executing the tactical operations. When operating in these environments, unit leadership must ensure they track staff and crew fighter management. During the investigation of this mishap, it was found that the unit fighter management tracking process was conducted initially but ceased once the optempo became high. This decreased key risk information was available to the briefing officer and the final mission approval authority.

Studies show human error increases with increased fatigue. As leaders and aviators, it is important to understand limitations based on factors affecting performance of duties. In this case, an overconfident and fatigued PC lost situational awareness and became focused on visually acquiring the second aircraft which had notified him of their relational clock position and that they were not a factor. This breakdown of the visual scan resulted in the CPG being "head-in cockpit," as directed by the PC. The PC was "head-out" but was not conducting an appropriate scan. This resulted in the pilot's failure to see the high-voltage wires until they were too close to evade. High optempo in Army aviation is nothing new to seasoned leaders and aviators. The key to the successful accomplishment of the tactical mission while minimizing risk resides in following the unit standard operating procedures (SOP). These procedures ensure leadership has the correct information to apply controls and crew fighter management is monitored to reduce the risk of human error due to aviator fatigue. ■

Class A - C Mishap Tables

	Manned Aircraft Class A – C Mishap Table									as of 14 Jan 19
	Month	FY 18					FY 19			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Fatalities
1st Qtr	October	1	2	7	0		1	1	3	0
	November	0	1	4	0		0	0	4	0
	December	1	0	8	0		1	2	1	0
2nd Qtr	January	1	1	3	2		1	0	0	0
	February	0	0	2	0					
	March	0	1	11	0					
3rd Qtr	April	1	2	4	2					
	May	1	0	5	0					
	June	1	1	5	0					
4th Qtr	July	1	0	6	0					
	August	3	1	6	1					
	September	1	1	8	1					
	Total for Year	11	10	68	6	Year to Date	3	3	8	0
	Class A Flight Accident rate per 100,000 Flight Hours									
	5 Yr Avg: 1.23		3 Yr Avg: 1.05			FY 18: 1.30			Current FY: 1.39	

UAS Class A – C Mishap Table									as of 14 Jan 19
	FY 18					FY 19			
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total
MQ-1	3	1	3	7	W/GE				
MQ-5	1	0	0	1	Hunter				
RQ-7	0	7	20	27	Shadow	0	0	6	6
RQ-11	0	0	0	0	Raven				
RQ-20	0	0	0	0	Puma				
SUAV	0	0	0	0	SUAV				
UAS	4	8	23	35	UAS				
Aerostat	4	2	1	7	Aerostat				
Total for Year	8	10	24	42	Year to Date	0	0	6	6

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

ARMY AIRCRAFT MISHAP PREVENTION DATA
FLIGHT FAX
ORVAL RIGHT
Chief Advisor on Matters of Aviation
A USAAAVS PUBLICATION

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Most Frequently violated Aviation Procedures

Statistics show that since 1980 human error has been a causal factor in about 80 percent of Army aviation accidents. And many human-error accidents involve noncompliance with safe operating procedures. Reviews of accident reports indicate that some of these procedures are frequently violated.

The Army Safety Center initiated a study to determine the specific procedures that are frequently violated. The objective of the study was threefold: to identify the most frequently violated procedures, to identify the precise steps or parts of the procedure that were violated, and to determine the reasons for noncompliance with the procedure. Armed with the study's in-depth analysis packages showing the specific steps or parts of each violated procedure and the causes of the violations, proponent agencies could then develop recommended actions to correct the underlying causes of these violations.

Procedures

All FY 84 through FY 89 Class A through C accidents attributed to human error were reviewed to verify that human error was a cause factor in each accident. The accidents were further analyzed to identify the specific task being performed by the crewmember committing the error and to identify the category of human-performance error. For each task and associated error, the researchers-two former Army aviators formally trained and highly experienced in conducting Army aircraft accident investigations identified the aircrew training manual (ATM), the specific task number, and the standard governing correct performance of the task. In those cases where an ATM did not adequately govern performance, the researchers identified a non-ATM procedure.

Findings

The study identified 15 frequently violated ATM procedures and 5 frequently violated non-ATM procedures in rotary wing aircraft accidents. Four frequently violated ATM procedures and seven frequently violated non-A TM procedures in fixed wing aircraft accidents were also identified. These most frequently violated rotary wing and fixed wing procedures accounted for72 percent (291) of the accidents, 69 percent (102) of the fatalities,

Procedure	Accidents	Fatalities	Injuries	Cost
Rotary Wing				
15 ATM procedures	188	49	193	$138,714,212
5 Non-ATM procedures	80	44	89	72,672,840
Fixed Wing				
4 ATM procedures	14	1	6	1,938,602
7 Non-ATM procedures	9	8	5	5,769,374
Totals	**291 (72%)**	**102 (69%)**	**293 (76%)**	**219,095,028 (75%)**

Table 1. Accidental losses accounted for by the most frequently violated procedures

76 percent (293) of the injuries, and 75 percent ($219,095,028) of the costs for FY 84 through FY 89 Class A through C human-error accidents ***(table 1 on page 8)***.

Initially, the most frequently violated procedures were identified solely on the basis of frequency of occurrence. The most frequently violated procedures were then further internally prioritized by evaluating each procedure in terms of frequency of violation occurrence, number of fatalities, number of injuries and total accident cost. A percentage was calculated for each of these parameters, and the most frequently violated procedures were ranked using an average percentage value of all four parameters. In this way, violated procedures with a low relative frequency of occurrence within the top violated procedures but with more significant impact on combat effectiveness in terms of lost personnel, equipment, and dollars were ranked above those more frequently occurring procedures having less severe consequences.

The results of the prioritized rankings are shown in ***tables 2 and 3***. Based on this information, users would then be able to concentrate their efforts on correcting the underlying causes of the procedural violations with the biggest payoff to the Army. Overall, the five most frequently occurring errors involved improper monitoring, poor decisions, improper control actions, inadequate inspections, and inadequate communications. Together, these accounted for 79 percent of the total number of identified errors. Improper monitoring and poor decision making accounted for 50 percent of the total errors.

Frequently identified causes of these errors included inadequate attention, overconfidence, inexperience, inadequate unit training, and improper motivation. Inadequate attention was found to be the most frequent cause for monitoring errors; overconfidence for decision errors; and inexperience for improper control action errors. No systemic cause could be identified for a large percentage of these errors.

In developing in-depth analysis packages for the top 15 rotary wing violated procedures, the following two problem areas accounted for 46 percent of the total number of errors:

- Monitoring errors, primarily caused by inadequate attention, were further pinpointed as scanning errors. ***Table 4*** on page 10 shows three scanning errors-fixated, limited, and improper technique distributed across the top 15 rotary wing ATM tasks.
  - Fixated scans describe a crewmember who discontinues head and eye movement when searching his field of view.

Rotary Wing	
ATM Task Number	***Task/Job/Activity***
1035/2081	Terrain flight
1071	Crew coordination
1083	Vertical helicopter instrument recovery procedure (VHIRP)
1017	Hovering flight
1001	Plan visual flight rules (VFR) flight
1028	Visual meteorological conditions (VMC) approach
2004	Pinnacle operations
1005	Preflight inspection
1032	Slope operations
1015	Ground taxi
2016	External load operations
1053	Simulated engine failure
2084	Terrain flight approach
1031	Confined area operations
Fixed Wing	
ATM Task Number	***Task/Job/Activity***
1027	Engine failure takeoff
1020	Normal landing
1007	Taxiing
1021	Power approach/precision landing

Table 2. Prioritized ranking of violated rotary and fixed wing ATM procedures

Rotary Wing Reference	***Fixed Wing Reference***
AR 95-1	C-7A Operator's Manual
TC 1-204	U-21 Operator's Manual
TC 1-201	

Table 3. Prioritized ranking of violated rotary and fixed wing non-ATM procedures

- Limited scans describe a crewmember who searches only a portion of his field of view.
- Improper technique describes a crewmember who scans too close in, too far out, too fast, or too slow.

• Planning, decision, and communications errors were further pinpointed as five crew coordination failures: failure to direct assistance, announce decisions, use positive communications, assign crew duties, and offer assistance ***(table 5 below)***.

The leading type of crew coordination failure was failure of the crewmembers not on the controls to offer assistance or information that was needed or had been previously requested by the crewmember on the controls. This and other types of crew coordination failures occurred more often in utility helicopters than in other types, while cargo helicopters had a much lower incidence. Like scanning errors, almost 74 percent of the crew coordination failures occurred during the day.

Aircrew Training Manual Tasks												
Error Type	**1035**	**1017**	**1031**	**1028**	**1053**	**1071**	**1015**	**1083**	**2084**	**1032**	**2016**	**Total**
Fixated	15	7	2	3	1	2	1	2				33
Limited	14	3	7	3		1	2	1				31
Technique	8	1	2		3				2	1	1	18
Totals	**37**	**11**	**11**	**6**	**4**	**3**	**3**	**3**	**2**	**1**	**1**	**82**

Table 4. Scanning errors by the top 15 rotary wing ATM tasks

Aircrew Training Manual Tasks									
Failure Types	**1071**	**1035/ 2081**	**1015**	**1028**	**2004**	**2016**	**1017**	**1001**	**Total**
Direct assistance	3		1						4
Announce decision	2			1			1		4
Positive communication	4	1							5
Assign crew duties	2		1		1			1	5
Offer assistance/information	12	7				1			20
Totals	**23**	**8**	**2**	**1**	**1**	**1**	**1**	**1**	**38**

Table 5. Aircrew coordination failures by top 15 rotary wing ATM tasks

The study's findings indicate that the ATM tasks associated with flight close to the earth's surface adequately address the requirement to remain clear of obstacles and the supporting references provide sufficient guidance about scanning and obstacle-avoidance techniques. However, the methods of imparting this information during institutional training and the degree of emphasis placed on the technique and teamwork required to optimize crewmember scanning effectiveness did not appear to be standardized or completely effective.

Recommendations

Both the scanning and crew coordination problem areas have been previously identified by the Army Aviation Center. Within the past year, a new appendix to Technical Circular (TC) 1-204, Night Flight Techniques, dealing with crew coordination and scanning during NVG operations in the desert has been distributed to the field. In addition, the revised TC 1-210, Aircrew Training Program, Commander's Guide to Individual and Crew Training and TC 1-214, Aircrew Training Manual, Attack Helicopter AH-64 have both incorporated crew coordination requirements into the training plan and individual ATM tasks. These same requirements will be incorporated into future revisions of all the ATMs.

Information from the study should be used by training developers, institutional and unit trainers, and evaluators in formulating and executing training programs to integrate crew coordination into initial entry rotary wing and other training courses.

The study also recommends that the number of unexplained causes of errors in the accident reports be reduced and attempts made to improve the overall quality of accident reports, especially Class C reports. Within the top 15 rotary wing ATM violated procedures, the unknown or insufficient information category was mostly cited in the Class C accidents. Because most of the Class C investigations are conducted by unit personnel, this high percentage of unknown cause factors may reflect an inadequate level of training provided to unit aviation personnel

who are responsible for investigating accidents or inadequate investigative experience on the part of the field unit investigators.

According to the study, inadequate attention was cited as the cause for almost 71 percent of the monitoring errors. But inadequate attention as a systemic cause category does little to explain the nature of monitoring errors. It does not provide any information as to where the aviator's attention was focused and why it was focused there. Accident investigators should explore monitoring errors in greater depth to determine why an aviator's attention was not concentrated at the proper place at the proper time.

The study also revealed a large number of decision errors in the data sample, including a variety of judgmental errors associated with assessing relative risk. These findings indicate the need for crewmembers to become more proficient in using the risk management process. Fully understanding the risk management process will give crewmembers a tool to help them make smart risk decisions. And the ability to make smarter risk decisions should help crewmembers decrease the probability of procedural violations, thereby resulting in fewer accidents and a savings in personnel and equipment and an increase in overall warfighting capability. ■

Mary Ann Thompson
Research and Analysis Section

Flightfax Forum / Hot Topics

Broken Wing Award

Congratulations to CW3 Mulheron of the 116th MI BDE, his actions in responding to an engine failure on takeoff in the MC-12M aircraft resulted in a safe landing and no damage to the aircraft. Job well done!

National Training Center Current Eagle Team Initiatives

China Lake Integrated Air Defense System (IADS) – China Lake Naval Testing Facility offers AvTF the ability to plan and operate within in an integrated air defense system (IADS) and against Tier 1 threat systems rotary wing units will likely see in the enemy order of battle.

Advanced Gunnery Qualification (TB IX & XII) – As part of the Force on Force (FoF) under live fire conditions, we have added Division level missions to support Table VIII and IX qualifications in support of BSA LFX and Table XI and XII as part of a Deliberate Attack into Leach Lake.

LTC Clint Cody, Eagle 07
NTC Senior Aviation Trainer
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Mishap Briefs #71

Cargo Helicopters

CH-47

F Model – During ground-taxi the right aft-landing gear reportedly entered a pitted section of the taxiway, temporarily filled with rocks and gravel, resulting in separation of the landing gear and damage to the strut. (Class C)

Utility Helicopters

UH-72

A-Model – Aircraft initiated un-commanded spin during Basic Warfighter Skills NVG training and landed hard following autorotation by IP. Aircraft sustained significant damage; Crew was able to egress, following aircraft shut-down. (Class A)

A-Model – Aircraft experienced a LOW ROTOR condition during OGE Fly-Away training maneuver and was subsequently landed hard on the lane. Rear cross-tube of the landing gear was determined to have sustained damage. (Class C)

Attack Helicopters

AH-64

E Model – Reported power loss on departure from FARP at 15-50' AGL and aircraft descended to ground contact. (Class A)

D Model – Reported bird strike on downwind for landing. Damage reported to main rotor blade tip cap. (Class C)

Fixed Wing

C-12

T Model – Aircraft encountered landing gear failure causing class B damage with no injuries. (Class B)

W Model – Aircraft was struck by lightning on short final, resulting in damage to wing tip devices on each wing. ECOD is 120k. (Class C)

KA-300

KA Model – In-flight engine failure reported initially as a mishap, pending safety investigation. (Class C)

C-37

A Model – Following touch and go landing training, post-landing inspection revealed damage to two MLG tires and the LH Outboard Landing Gear Door. Class C damage reported. (Class C)

Unmanned Aircraft

RQ-7

B Model – Aircraft experienced a TALS FUSE FAIL FAILURE and crew initiated the FTS. Recovery chute was deployed and the system was recovered with damage. (Class C)

B Model – Crew experienced engine failure followed by loss of RPM during flight and initiated the FTS. Recovery chute was deployed and the system was recovered with damage. (Class C)

B Model – During TALS loiter, the AV experienced a propulsion failure. The parachute was deployed and the AV has been recovered. (Class C)

BV2 Model – During mission, the AV experienced a propulsion failure. The FTS was deployed and AV recovery is in progress. (Class C)

BV2 Model – Aircraft experienced RPM drop and was unable to maintain altitude during initial climb. FTS was initiated and recovery chute deployed. System was recovered with damage. (Class C)

BV2 Model – Air vehicle sustained damage when it touched down hard during TALS recovery, resulting in separation of the main landing gear and damage to the payload. (Class C)

BV2 Model – During the mission, the AV experienced a propulsion failure. The parachute was deployed and the AV has been recovered. (Class C)

UNMANNED ≠ EXPENDABLE

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

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

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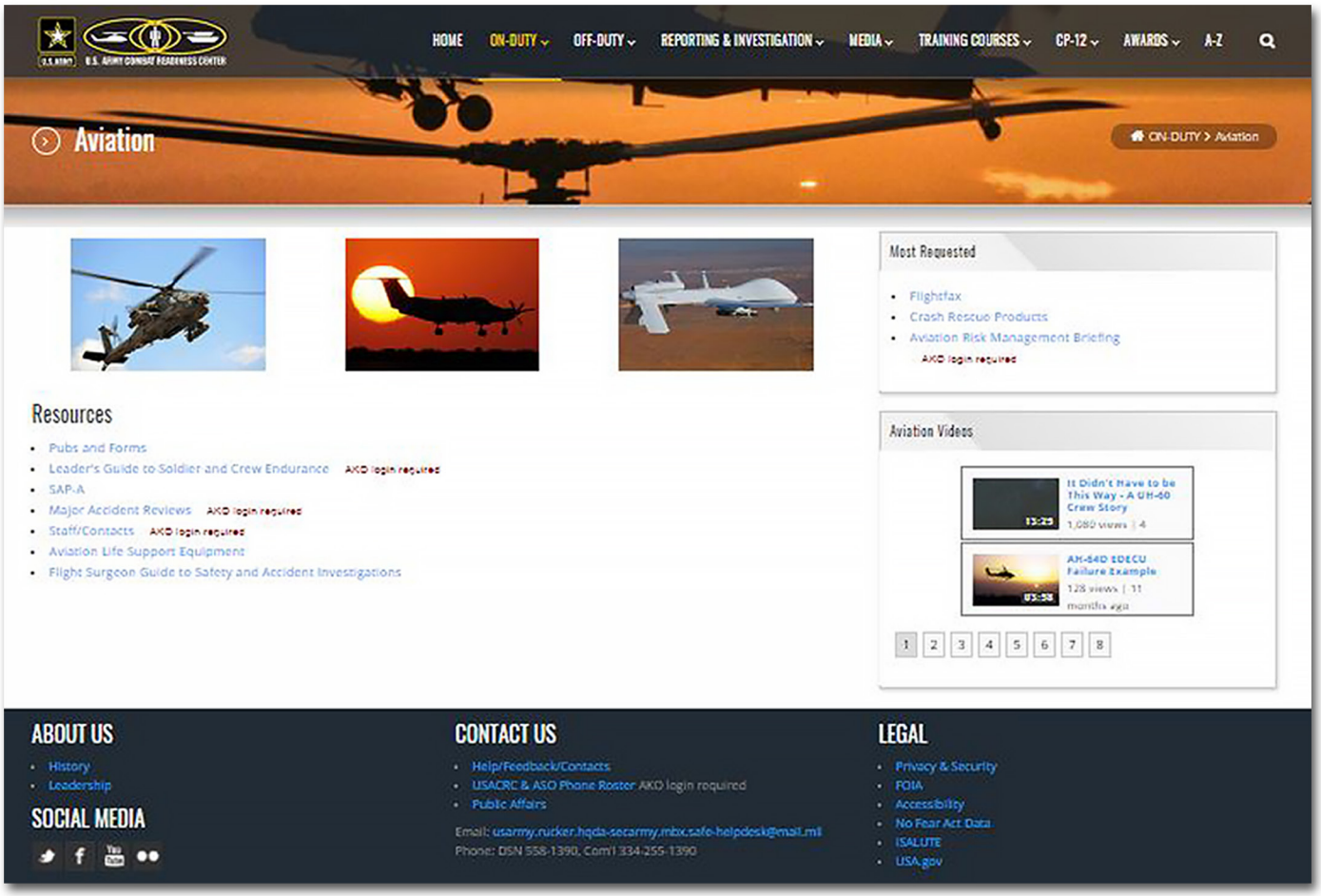

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