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**BEFORE THE
HOUSE ARMED SERVICES COMMITTEE
HEARING ON MILITARY AVIATION SAFETY
FEBRUARY 11, 2004**

Mr. Chairman, distinguished members of the committee, thank you for inviting me to speak to you today about military aviation safety.

Military aviation safety is a concern, because aviation accidents (also known as mishaps) erode DoD's war fighting capabilities in many tangible and intangible ways. Accidents degrade operational readiness. They cost lives and hurt morale. They reduce the number of aircraft readily available, both because of damage and aircraft destruction, and also because aircraft are often grounded while accidents are investigated. Accidents consume financial resources. Damaged aircraft must be repaired, and destroyed aircraft replaced. Accident investigators must be trained, and investigations funded. Accidents are hard on personnel. According to DoD records, 3,072 people died in military aviation accidents between 1980 and 2003.¹

As you requested, this testimony will address four questions:

- What is DoD's recent military aviation safety record?
- Is this record acceptable?
- What are the leading factors that contribute to military aviation mishaps?
- What initiatives might be pursued to improve military aviation safety?

DoD's recent military aviation safety record

Assessing accident data over time can be useful when trying to make observations on whether safety is improving, worsening, or holding steady. Making observations on aviation safety trends depends on perspective. Making observations is complicated by wide variations in accident rates over time, and by the fact that the military Services do not record accident data in a coordinated and uniform manner.

From one perspective, it can appear that military aviation accidents are becoming less frequent, suggesting that military aviation is becoming safer. Over the last 50 years, according to DoD data, the frequency aviation accidents has dropped markedly. In 1955, for example, DoD suffered over 2,200 Class A aviation mishaps. A mishap is categorized as Class A if the total cost of damages to Government and other property is \$1 million or more, a DoD aircraft is destroyed, or an injury and/or occupational illness results in a fatality or permanent total disability. By 1999, this number had dropped to 70. Perhaps more significantly, the annual number of mishaps per 100,000 flight hours has similarly dropped over this time period.² In 1975, the Class A mishap rate was over 4 per 100,000 flight hours. In 1993 that rate had been cut in half.³ In 1954, the Navy lost 776 aircraft to

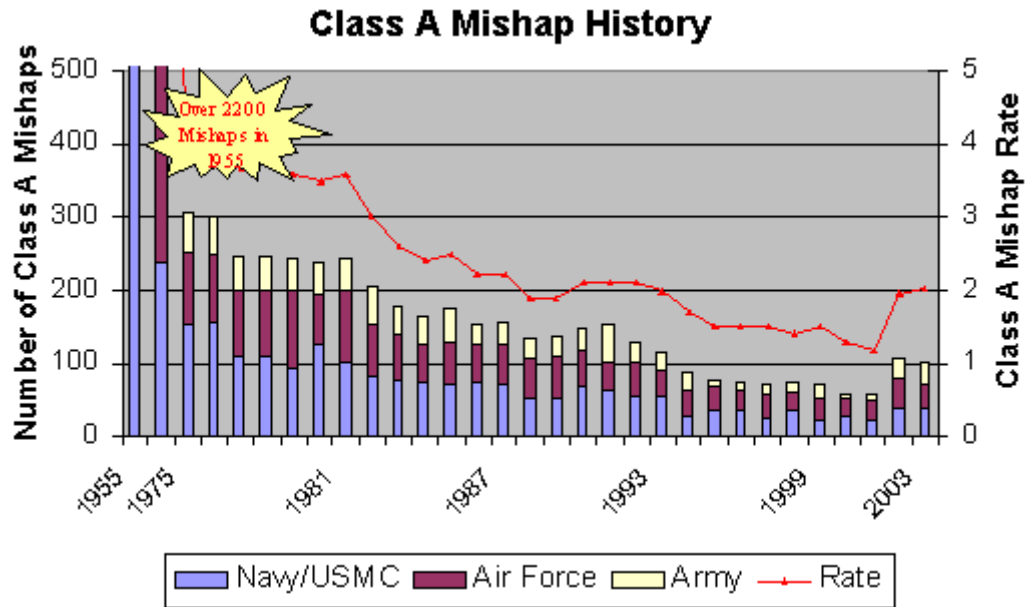
¹Data provided by Service Safety Centers: 613 fatalities for the Army, 1,193 fatalities for the Air Force, and 1,266 fatalities for the Navy and Marine Corps.

²In 1954, DoD operated many more aircraft than it does today. Therefore, comparing 2,200 mishaps in 1955 to 70 in 1999 is not an "apples-to-apples" comparison. Dividing the number of mishaps by 100,000 flight hours makes the comparison of two different sized forces valid. The dotted line in Figure 1 indicates this "mishap rate" over time.

³See Appendix II.

mishaps. By 2001, the number had dropped to 15 aircraft.⁴ During this time period, DoD has implemented a variety of measures that it says have contributed to lowering mishap rates. The Navy, for example, began fielding aircraft carriers with angled decks. All the Services initiated safety programs, and opened safety centers during this time period.

Figure 1. Number and Rate of Class A Mishaps, 1955-2003



Source: Institute for Defense Analyses chart, prepared for Assistant Deputy Undersecretary of Defense (Safety & Occupational Health). Updated by CRS.

From another perspective, however, it appears that while accidents may be less frequent than in the past, recent improvements in aviation safety may have slowed, and the frequency of accidents has not appreciably declined lately. The Defense Science Board noted that “the previously declining DoD accident rate (1950 to 1994) has now reached a plateau.”⁵ A review of DoD mishaps indicates that between 1995 and 2001, aviation mishap rates remained relatively constant, at or near 1.5 per 100,000 flight hours.

In any given time span, the number of accidents can vary considerably, suggesting that improvements in safety may not be inevitable nor permanent. The time period 1997 to 2003 is a good example of the apparent variability in aviation accidents. On September 17, 1997, Secretary of Defense William Perry directed that all four military Services conduct a mandatory 24 hour cessation of aviation training missions. Concerned about a large number of aircraft mishaps, Perry urged commanders to “thoroughly examine our training missions, ensuring that our crews are

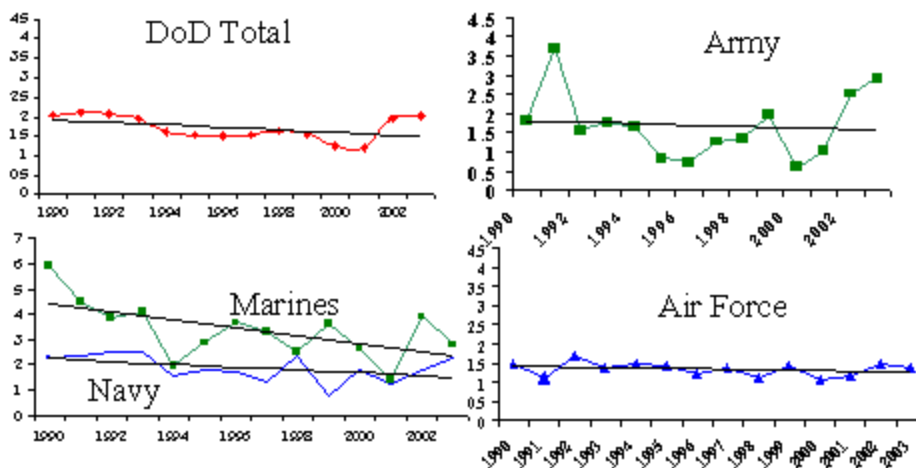
⁴Captain Kurt Garbow. Deputy Special Assistant for Safety Matters. OPNAV N09FB. “Naval Aviation Safety Briefing.” February 28, 2002.

⁵Report of the Defense Science Board Task Force on Aviation Safety. February 1997. Office of the Undersecretary of Defense for Acquisition and Technology. Washington, D.C. February 27, 1997.

appropriately tasked and that missions are conducted as safely as possible.”⁶ Just three years later, in FY2000, DoD reported that it experienced its safest aviation year up to that time, with only 1.23 accidents per 100,000 flight hours.⁷ Mishap rates in FY2001 were even lower. By February 2002, however, safety (in the Air Force) had again become cause for concern. Because “The Air Force has had twice as many aircraft crashes this year as it had at the same time in 2000 and 2001,” Air Force Chief of Staff General John Jumper took the unusual step of ordering every unit worldwide to stop operations for a day to focus on safety.⁸ The commander of the Air Force’s Air Combat Command repeated the “day off” tactic on December 6, 2002 because mishaps continued to accumulate.⁹ The combined DoD Class A mishap rate for 2002 was 1.95, the highest rate in ten years (2.07 in 1992). FY2003 continued this negative trend, with a combined Class A mishap rate of 2.03.

The Services’ aviation safety records contrast sharply. Over this time period, the Air Force has consistently experienced the lowest rate of mishaps. The other Services tend to have higher incidences of mishaps and greater variability in the number and rate of mishaps from year to year.

Figure 2. Class A Aircraft Mishap Rate
(Includes OEF and OIF)



Source: U.S. Military Accident Statistics as of November 4, 2003. Deputy Undersecretary of Defense for Installations and Environment (DUSD(I&E))

The contrast between the Services extends back to at least 1980. Between 1980 and 2003, the Air Force experienced the greatest number of Class A mishaps. Due to its very large number of flying hours (between 2 and 3.5 million hours annually) these mishaps translated into the lowest Class A mishap rate among the Services, with 1.6 per 100,000 flying hours. The Marine Corps

⁶Memorandum for Secretary of the Army, Secretary of the Navy, Secretary of the Air Force. September 17, 1997. The Secretary of Defense. Washington, D.C.

⁷“Citing Mishap Rates, DoD Calls FY-00 the Safest Aviation Year Ever.” *Inside the Air Force*. October 6, 2000.

⁸ John Diedrich. “Air Force Ordered to Think Safety.” *Colorado Springs Gazette*. February 8, 2002.

⁹ “Ari Force Pilots Will Take a Day Off.” *Los Angeles Times*. December 6, 2002.

experienced the fewest number of mishaps, but because it flies comparatively less, (between 260,000 and 460,000 hours annually) it showed the highest Class A mishap rate, with 4.55 per 100,000 flight hours, almost three times the Air Force rate.

Table 1. DoD Aviation Class A Mishaps 1980-2003¹⁰

	Total #	Mishap Rate (#/100,000 flight hours)
Air Force	1,010	1.46
Army	603	1.8
Navy	821	2.33
Marine Corps	369	4.07
DoD	2,803	2.41

Is this record acceptable?

There is no consensus among analysts nor policy makers on the state of military aviation safety. Many argue that the current mishaps rate is acceptable. They point out that: (1) military aviation operates under very trying circumstances, (2) DoD appears to make safety a high priority, (3) mishap rates have steadily declined over the last 50 years, and (4) contemporary mishap rates have been very low by historical standards. Others disagree, saying that the contemporary mishap rate of 1.7 Class A mishaps per 100,000 flight hours (1990-2003 average) is too high.

Some observers say that DoD should strive toward a goal of zero aviation mishaps. Proponents of this perspective argue that there is no “acceptable” accident rate and a single accident or fatality is too high. People die in accidents often needlessly, zero-mishap proponents say, and by focusing on rates and statistics, policy makers lose sight of this. They point out that although DoD’s Class A mishap rate steadily improved between 1990 and 1996, 777 people died and \$9.42 billion in equipment was destroyed in aviation accidents in that time period.¹¹ The fact that the aviation mishap rate was the lowest ever in FY2000, was little consolation to families who lost loved ones in accidents, zero-accident proponents say. The corrosive effects of aviation accidents on military readiness are well documented. By tolerating even one aviation accident, we unnecessarily hamstring the military, which is already facing serious challenges on the battlefield, they argue. Some DoD and Air Force officials have expressed support for a goal of zero mishaps.¹²

Others argue that while mishaps and especially mishap fatalities are unfortunate and to be

¹⁰Source: Safety Centers.

¹¹ Report of the Defense Science Board Task Force on Aviation Safety. February 1997. Office of the Undersecretary of Defense for Acquisition and Technology. Washington, D.C. February 27, 1997. p.ES-2.

¹²DoD spokesman Kevin Bacon in “Citing Mishap Rates, DoD Calls FY00 the Safest Aviation year Ever.” *Inside the Air Force*. October 6, 2000. And Maj. Gen. Kenneth Hess, in “A Plague of Accidents.” *Air Force*. February 2004.

avoided, some number of accidents is inevitable. Those who believe that low mishap rates are tolerable, point out that not even commercial airlines have achieved a zero mishap rate, despite considerably more benign flight conditions. Training for and conducting military operations assumes some inherent risk. Low mishap rate proponents argue that the risk of accidents should be minimized, but will remain nonetheless. While striving for zero mishaps may be a worthy goal, they believe it is unlikely to be achieved; accordingly, aviation safety can and should be improved by striving toward an ambitious, yet achievable goal. Some low mishap rate advocates point toward the commercial aviation major mishap rate of .033 per 100,000 flight hours as one benchmark.

Leading factors that contribute to military aviation mishaps

Assessing the cause of mishaps is central to preventing them, or reducing their likelihood in the future. Many factors can contribute to aviation mishaps. Human error, mechanical failure, weather, and maintenance problems are some of the factors that can by themselves, or in conjunction, cause an aviation mishap. Often, singling out “the” cause of a given accident is difficult. Observers tend to argue that high operations tempo (OPTEMPO), aircraft age, and human error have strongest correlations with increased mishaps.

OPTEMPO. Many observers warn that simultaneous operational conflicts, and reduced manpower and equipment may speed up OPTEMPO to a degree that safety is compromised. Some fear that due to the demands of the war on terrorism less experienced people may be “back-filling” critical jobs, the military may be taking more chances, and an intensified training pace may result in increased aviation mishaps. For example, “Anytime you have an increase in the training cycle or in support of combat operations, it raises the probability that more accidents will occur,” according to one observer.¹³ Others argue that deploying overseas and fighting wars are what the military is designed to do, and that high OPTEMPO is “business as usual.” Thus, mishap rates should not, and do not, increase during war, they argue.

According to a 1996 GAO report, “while service studies have addressed the relationship of operating tempo to aviation mishaps, direct correlation has been inconclusive.”¹⁴ The GAO points out that “the relatively low incidence of Class A flight mishaps make drawing inferences and statistical correlations of variables with mishap rates difficult.”¹⁵ In this report, the GAO described two seemingly contradictory Air Force studies, one that found that there was not a cause and effect relationship between OPTEMPO and aviation mishaps, and another that found that high OPTEMPO posed an “obvious operational safety risk.”

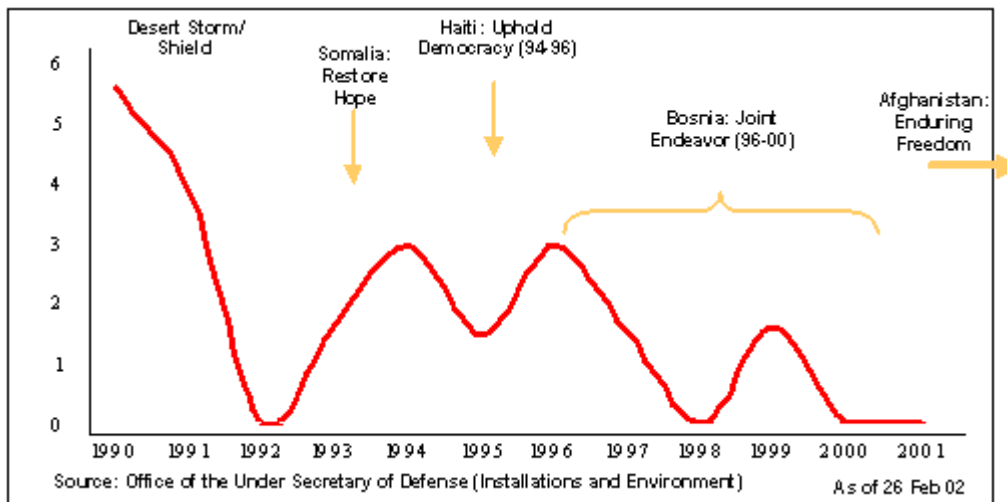
Office of the Secretary of Defense (OSD) records also suggest a tenuous relationship between OPTEMPO and aviation mishaps. As the chart below shows, aviation mishap rates have fluctuated during operational conflicts. Often, mishap rates have risen during conflicts, but they have decreased as well. Sometimes, as during Operation Joint Endeavor, mishap rates have been both relatively high and low.

¹³Jane McHugh. “Shinseki” Cut Accidents.” *Army Times*. September 2, 2002. p.8.

¹⁴ “Military Aircraft Safety: Significant Improvements Since 1975.” General Accounting Office. GAO/NSIAD-96-69BR. February 1996. P.27.

¹⁵ *Ibid*

Figure 3. Class A Accident Rates and Recent Conflicts



Some observers say that an apparent rise in aviation mishaps during FY2002 and FY2003 is in part attributable to pressure caused by the global war on terrorism and the war in Iraq. “I think the system is straining under its previous burden. What we have is a previously strained and overburdened military system, and then we get ourselves into a war in Afghanistan” commented one safety expert.¹⁶

A spokesman for the Air Force Safety Center’s aviation division reportedly claimed that higher accident rates were caused by the hazardous missions flown in Afghanistan and Iraq.¹⁷ In mid-2002, the chief of Air Force safety commented, “None of the accidents we have investigated so far this year for which there is a completed investigation have come up and said that training or ops tempo or things like that are contributing factors.”¹⁸ In 2002, Marine Corps safety experts also downplayed the relationship operations and mishaps: “In deployments, we are doing a fantastic job. It’s back here at home in training, where we are not so focused that we are having problems (with mishaps)”¹⁹ Even prior to the war in Iraq, the effect of OPTEMPO on mishap rates was debated. A 2000 Army report on safety found “The sense of a higher risk tends to sharpen our awareness of the dangers, and we rise to meet the challenge.”²⁰

While no correlation between high OPTEMPO and increased mishaps has been proved, it also cannot be disregarded. A great degree of uncertainty remains.

Aircraft Age. Many observers argue that as aircraft age, they require more maintenance. More maintenance, in turn, presents increased opportunities for error and oversight. Also, it is argued,

¹⁶Russell Carollo. “31 Dead In Military Aviation Accidents Since Oct. 1.” *Dayton Daily News*. March 3, 2002.

¹⁷Bruce Rolfsen. “Friendlier Skies.” *Air Force Times*. October 27, 2003. p.10.

¹⁸Bruce Rolfsen. “22 Flight Deaths, and a Search for Answers.” *Air Force Times*. August 26, 2002. p.10.

¹⁹Sandra Erwin. “Navy Aviation Mishaps Cost \$4.3 Billion Over Five Years.” *National Defense*. October 2002. p.40.

²⁰ “Army Aviation Safety Record Worsens.” *Helicopter News*. January 14, 2000.

older parts and equipment are more likely to fail than newer equipment, causing aviation mishaps.

The average age of DoD aircraft is increasing. In the Air Force, for instance, some estimate that the average aircraft age in 2002 was 22 years, up from 13 years in 1990.²¹ In 1999, the Congressional Budget Office (CBO) offered a more conservative estimate, "...the average age of Air Force aircraft...will exceed 15 years by 2002." But CBO cautioned that the average aircraft age will continue to increase into the next decade. "That average age will climb to a peak of almost 20 years in 2011 before starting to decline as Joint Strike Fighters become operational."²²

Intuitively, this line of reasoning – that older aircraft are more prone to accidents – makes sense, and if true, one would expect aviation mishaps to increase as the age of the military's aircraft increased. However, mishap statistics and observations by military safety center officials bring into question a cause and effect relationship between aircraft age and mishaps. While the average age of Air Force aircraft, for example, increased from 1990 to 2000, mishap statistics indicate that Air Force accidents slowly decreased over this same time period.

It also appears that growing concern over Navy and Marine Corps accidents comes during a downward trend in material failures. Reportedly, over the last 10 years the number of material failures contributing to a mishap has been .86 per 100,000 flight hours. Over the past five years, that rate has decreased to .71 per 100,000 flight hours. Navy statistics indicate that between 1997 and 2001, material factors contributed to mishaps at a rate of .68 per 100,000 flying hours.²³

The Class A mishap rates for FY2002 and FY2003 are higher than FY2001. Some believe that this increase in mishaps is due to aging aircraft. Many of the aircraft involved in Class A mishaps, reportedly, are among the younger aircraft of their type. A Marine Corps CH-53E helicopter crash that killed two Service members in Afghanistan was eight years old. An EA-6B *Prowler* that crashed into the Atlantic Ocean was 11 years old, and a Class A mishap in March 2002 involved a relatively young (13 years old) F-14 *Tomcat*.²⁴

Human Factors. In many ways, humans are more complicated and more difficult to predict and control than are machines. Therefore, it may not be surprising that human error appears to be a dominant factor in aviation mishaps. The Defense Science Board – DoD's premiere body of scientific and technical advisors – found in 1997 that "Human performance is a causal factor in over 70% of all Class A mishaps."²⁵ As the following table suggests, human error (at least for the Navy and Marine Corps) may have had an even stronger influence on aviation mishaps in the time period 1997-2001.

²¹Loren Thompson. "Aging Aircraft: Clinton Decay Continues Under Bush." Issue Brief. March 1, 2002. Lexington Institute.

²² Statement of Christopher Jehn, Assistant Director National Security Division, Congressional Budget Office on Modernizing Tactical Aircraft. Before the Subcommittee on Airland of the Committee on Armed Services United States Senate. March 10, 1999.

²³ Tom Bowman. "Age of U.S. Aircraft Fleets Stirs Concern in Military." *Baltimore Sun*. April 15, 2002.

²⁴ *Ibid*

²⁵Report of the Defense Science Board Task Force on Aviation Safety. February 1997. Office of the Undersecretary of Defense for Acquisition and Technology. Washington, D.C. February 27, 1997.

**Table 2. USN/USMC Class A Mishap
Causal Factors (FY97-01)²⁶**

Factor	# Events	Rate	%
Human Error	114	1.52	86
Supervisory	91	1.21	69
Aircrew	88	1.17	67
Material	51	.68	39
Maintenance	18	.24	14
Facilities	13	.17	10

It appears that human performance affects all four Services more or less equally. The GAO found that “During Fiscal years 1994-95, human error was a factor in 71 percent of Air Force mishaps, 76 percent of Army mishaps, 74 percent of Navy/USMC mishaps.”²⁷

The Army Safety Center stresses the impact of human error on aviation mishaps. When accident causes are examined, a major issue in aviation safety remains human error. Although training and leadership can often bear some of the responsibility, it is generally the case that soldier indiscipline, inattention, or the willful neglect of published rules or safeguards is cited as a contributing actor.²⁸

According to the Army, between fiscal years 1999 and 2001, the leading causes of Army aviation accidents were: In-discipline (28.4%), Leadership (17.8%), Training (13.6%), and Standards (10.1%). Materiel failures, by comparison, caused 2.5% of accidents.²⁹ Army records indicate that “individual failure” (e.g. crew coordination, overconfidence, indiscipline) was a causal factor in 90.9% of Class A mishaps in FY03.³⁰ These figures lend credence to human error being a major and consistent cause of aviation accidents for all services.

The Coast Guard details some of the kinds of human errors that can lead to mishaps. In FY2001, for example, 89 percent of Coast Guard mishaps involved incomplete, improperly followed, inappropriate or unavailable procedures. Fifty five percent of mishaps involved inattention, complacency, or lack of awareness. Twenty five percent of mishaps involved incomplete

²⁶ Captain Kurt Grabow. Deputy Special Assistant for Safety Matters. OPNAV N09FB. "Naval Aviation Safety Briefing." February 28, 2002.

²⁷“Military Aircraft Safety: Significant Improvements Since 1975.” General Accounting Office. GAO/NSIAD-96-69BR. February 1996. P.24.

²⁸ *Flightfax* Aviation Safety Performance Review. May 28, 2002. U.S. Army. [<http://safety.army.mil/home.html>]

²⁹Army Safety Program. “4th Quarter FY01 Roll-Up.” [<http://safety.army.mil/home.html>]

³⁰ “Human Error in Army Aviation Accidents.” *Flightfax*. November 2003. p.4.

checklists and poor communication. Workload, feeling rushed or having a lack of resources were mentioned in almost 40 percent of Coast Guard mishaps. Inexperience, lack of training, and inappropriate staffing were also factors in 40 percent of mishaps in FY2001.³¹

Initiatives that might be pursued to improve military aviation safety

If policy makers wish to attempt to reduce aviation mishaps below their current rate, there appear to be four broad and interrelated areas where action could be taken: leadership, organization, budget, and aggressive fielding of safety technologies. Each of these options would have pros and cons.

Leadership. Considering the numerous, and often overlapping causes of military aviation mishaps, there is likely no single “silver bullet” that can significantly improve safety. However, many observers believe increased leadership on this issue may affect more mishap cause areas than any other single measure. Congress could consider requiring annual testimony on the status of military aviation safety to help motivate senior military leaders to take a more active role in promoting safety. The General Officers³² who lead the Service safety centers might be directed to assess for Congress their Service’s safety performance and make recommendations for improvements. Having the Service Chiefs, who are ultimately responsible for safety, testify would be another option.

As of October 2003, the DoD’s recently established Defense Safety Oversight Council (DSOC) had held two meetings. To reflect its broad charter, the DSOC is divided into 10 task forces, which were established to “foster quick wins and other initiatives for implementation across DoD.”³³ An Aviation Safety Improvements Task Force has been formed, and is chaired by Major General Ken Hess, Chief of Air Force Safety. The Aviation Safety Improvements Task Force’s tasks are

to recommend policies, programs, and investments to reduce aircrew fatalities, injuries and aircraft accidents. Assess, review, and advise on improving all aspects of existing/proposed aviation safety programs such as: Military Flight Operations Quality Assurance (MFOQA), Human Systems Integration, Other Aviation Safety Systems.³⁴

The DSOC appears to have a clear and direct lines to DoD’s top leaders. Monitoring the progress of the Aviation Task Force, and the implementation of its findings and recommendations may be an on-going focus of congressional oversight.

Organization. It is difficult for leaders to affect change if they do not have the organizational instruments to implement revised policies and procedures. Currently, two organizational issues stand out in the area of military aviation safety. First, the Office of the Secretary of Defense (OSD) is responsible for setting safety policies and providing oversight. However, there is not one

³¹ *FY01 Aviation Safety Report*. U.S. Coast Guard. Health & Safety Directorate. Aviation Safety Division. P.11.

³²The Marine Corps Safety Center is headed by a Colonel. The other Safety Centers are run by one or two star General Officers.

³³*DSOC Task Forces*. October 6, 2003. Briefing found at DUSD (I&E) website. [https://www.denix.osd.mil/denix/Public/ES-Programs/Force/Safety/measure_merit.html]

³⁴*Ibid*

individual in OSD whose sole responsibility is military aviation safety. GAO recognized this as a shortcoming in a January 2002 report:

The office responsible for aviation safety currently occupies a relatively low organizational position within the Office of the Secretary of Defense (OSD). As a result of downsizing by OSD several years ago, five safety positions, which shared responsibility for aviation safety issues, were abolished and a single staff member hired. This staff member's responsibilities include aviation safety and a number of other responsibilities, including compliance with the Occupational Safety and Health Act of 1970 (OSHA), as amended; fire and emergency services; range and weapons safety; and traffic transportation.³⁵

According to former OSD employees, at one time up to eight people in OSD worked exclusively on military aviation safety issues. If the current state of staffing inhibits OSD's ability to effectively execute its responsibilities in aviation safety, that may suggest that OSD leaders do not place a high enough priority on this issue.

The second organizational issue pertains to the Joint Staff and the Combatant Commands.³⁶ Currently, none of these organizations plays a significant role in promoting aviation safety or investigating mishaps. The Services, through their safety centers, conduct investigations, record and report mishaps, and generally promote aviation safety. However, DoD's guiding policy document on accident investigation, reporting and record keeping (DoD Instruction 6055.7, updated October 3, 2000) applies to the Joint Staff and the Combatant Commanders as well as the Services (Section 2 "Applicability and Scope."). This suggests that the Joint Staff and Combatant Commanders have the authority, and perhaps the responsibility, to take a more active role in aviation safety.

It is possible that the Services, and perhaps the Joint Staff and Combatant Commanders themselves, would resist increased Joint Staff/Combatant Commander participation in the safety process. However, it may be useful to explore what roles these organizations could play either to augment or even compete with the Service's safety processes. For example, could and should CINC's take an active part in investigating mishaps that occur in their geographic area of responsibility (AOR)? Are peculiar safety factors adequately considered when planning specific operations and exercises in their AORs? Could and should the Joint Staff take an active role in investigating accidents that involve more than one Service? Could and should the Joint Staff promote more standardized mishap recording and reporting among the safety centers?

Budget. Policy makers who wish to promote aviation safety could review three interrelated aspects of DoD's budget. First, a review of DoD's FY2004 budget request suggests that compared to the billions of dollars that are spent annually to repair or replace aircraft damaged or lost in mishaps, DoD requests little specifically for aviation safety. The Air Force – under the heading "Personal Safety and Rescue Equip." – requested \$12.7 million in procurement (\$5.3 million for "Night Vision Goggles", and \$7.4 million for "Items Less than \$5,000,000) and the Navy requested \$105 million in O&M funding for aviation safety related activities. There was no apparent request

³⁵"Aviation Safety: FAA and DoD Response to Similar Safety Concerns." General Accounting Office. GAO-02-77. January 2002. p.3.

³⁶Known as CINC's (for commanders in chief), examples include, U.S. European Command, U.S. Central Command, and U.S. Pacific Command.

for research into aviation safety.³⁷

It may be difficult for safety proponents to argue that the Services are spending too little on aviation safety, however, because of the second budget issue, which is that safety related equipment and initiatives are spread throughout the Services budgets, and at low levels of documentation. Aviation safety programs are not aggregated at a level that facilitates their identification, review and assessment. Many more Air Force programs than those mentioned above may contribute to aviation safety but are likely “buried” in the budget; aggregated under budget activities and line items such as “Aircraft Procurement,” “Modification of Aircraft,” or “Support Equipment and Facilities.”

A third budget issue is that because of this “dis-aggregation” of aviation safety programs and efforts, safety does not compete well with other programs in the annual budget process. In 1997, the Defense Science Board reported:

It appears that, because of budget procedures, military Services are not currently motivated to invest in safety technology that is likely to avoid down-stream loss of life and equipment, especially in non-combat aircraft. The emphasis has been and continues to be on equipment directly related to combat missions along with minimizing initial unit cost.³⁸

Those wishing to promote aviation safety could seek ways to help safety programs and initiatives compete with other programs and to help the Services appreciate the long term benefit of spending near term dollars on safety.

One option would be to “fence off” money in DoD’s budget specifically for aviation safety initiatives and programs. There is precedent for this kind of action. In their markup of DoD’s FY2001 request, appropriations conferees adopted a Senate proposal to create the National Defense Airlift Fund. The purpose of this fund was to recognize airlift as an asset that benefits all the Services, and to protect airlift money from competition with other programs (such as fighter aircraft) in the Air Force budget.³⁹ Congress might weigh creating a Military Aviation Safety Fund to provide more resources and focus for basic and applied research on aviation safety.

Opponents of creating a fund in DoD’s budget specifically for aviation safety, would likely argue that there are higher safety priorities. They may point out that there are more Class A accidents on the ground and more fatalities than there are in the air. For FY2002 and FY2003, for example, Army aviation experienced 11 flight and non-flight Class A mishaps and 13 fatalities. During that same time period, the Army experienced 99 ground Class A mishaps (on and off duty),

³⁷*Procurement Programs (P-1)* Department of Defense Budget Fiscal year 2004. February 2003. Office of the Under Secretary of Defense (Comptroller). *Operation and Maintenance Programs (O-1)*. Department of Defense Budget for Fiscal Year 2004. February 2003. *RDT&E Programs (R-1)*. Department of Defense Budget for Fiscal Year 2004. February 2003 Office of the Under Secretary of Defense (Comptroller).

³⁸Report of the Defense Science Board Task Force on Aviation Safety. February 1997. Office of the Undersecretary of Defense for Acquisition and Technology. Washington, D.C. February 27, 1997. P.14.

³⁹See CRS Report RL30685, *Military Airlift: C-17 Aircraft Program* for additional information.

resulting in 97 fatalities.⁴⁰ During FY03, the Marine Corps suffered 11 Class A flight mishaps, resulting in 16 fatalities. During this same time period, 107 Marines died in 97 ground mishaps.⁴¹ If any area should be singled out for special attention, some may argue, it should be ground safety, not aviation safety.

Another option would be to tie the procurement of new aircraft to a Class A mishap rate deemed acceptable. (This assumes that zero is not the desired rate.) The following illustrative scenario indicates how such a measure might work: In their FY20XX budget, the Navy requests 40 new F/A-18E/F aircraft. Ten of these requested aircraft would replace aircraft lost to Class A mishaps, which occurred at a rate of 2.0 per 100,000 flight hours. Safety advocates believe that this mishap rate is too high, and could be cut in half (1.0 per 100,000 flight hours). Therefore, funds would be provided for only half the replacement aircraft (five), to encourage the Navy to reduce mishaps in the future. Another option might be to transfer the funding requested for the remaining five replacement aircraft to the Military Aviation Safety Fund.

This option would have opponents. Some may oppose this approach because it appears to legitimize some level of mishaps. In the scenario above, a Class A mishap rate of 1.0 per 100,000 flight hours is considered “ok.” This would be particularly distasteful to zero-mishap proponents. Others would oppose the strategy of linking aircraft procurement to a low mishap rate because they believe that it would result in a tangible loss of near term combat capability (aircraft) with no guarantee of improved safety in the future. Application of such measures would likely be subject to a comparison between the potential safety benefits gained and the operational capabilities lost or deferred.

Safety Technology. Many have argued that military aircraft do not tend to employ the same safety equipment as found in the civil sector, and that the Services tend to field safety equipment years after it is fielded in the civil world. According to one aviation safety law professor “military aviation lacks some of the essential safeguards of civil aviation.”⁴² The GAO found that the FAA mandated commercial aircraft employ two key safety technologies – Ground Proximity Warning Systems and Traffic Alert and Collision Avoidance Systems – decades before DoD began employing similar systems.⁴³

Both the Defense Science Board and a government/industry Commercial Aviation Safety Team have drafted “short lists” of the safety technologies they believe would most improve safety in military and commercial aviation respectively. The Defense Science Board recommended DoD more aggressively invest in ground collision avoidance systems, flight data and cockpit video recorders, tactile situational awareness system (TSAS), night vision devices, and wind shear detection

⁴⁰ U.S. Army Safety Center. *Quarterly Report*. February FY03. [<http://safety.army.mil/ipr/index.asp>]

⁴¹ *USMC Safety Statistics*. U.S. Marine Corps Safety Division. [[http://www.hqmc.usmc.mil/safety.nsf/\\$about?OpenAbout](http://www.hqmc.usmc.mil/safety.nsf/$about?OpenAbout)]

⁴²Russell Carollo. “31 Dead in Military Aviation Accidents Since Oct. 1.” *Dayton Daily News*. March 3, 2002.

⁴³“Aviation Safety: FAA and DoD Response to Similar Safety Concerns.” General Accounting Office. GAO-02-77. January 2002. p.47-51.

systems.⁴⁴ A recently completed Commercial Aviation Safety Team study assessed 700 safety technologies over five years and recommended 16 high impact proposals in the areas where mishaps most frequently happen: loss of control, approach and landing, and runway incursions.⁴⁵

The Services offer several arguments for why military aircraft do not always field the same safety equipment as found on commercial aircraft. Lack of funds is one argument, degradation of aircraft performance is another. However, Congress could evaluate the appropriateness of the new FAA safety recommendations for military operations, and weigh the soundness of Service arguments with other issues discussed in this report. For example, could investments in safety today achieve cost savings in the future?

Mr. Chairman, this concludes my remarks. Thank you for the opportunity to appear before you and discuss this important issue. I look forward to addressing any questions you or the committee may have.

⁴⁴Defense Science Board op cit. p.35.

⁴⁵See Appendix III for specific recommendations.