

Subcommittee on Aviation

Hearing on

Arming Flight Crews Against Terrorist Acts

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PURPOSE

The purpose of this hearing is to discuss issues associated with providing firearms and/or less-than-lethal weapons to flight crews for the purpose of defending aircraft against terrorist acts.

BACKGROUND

Since the tragedies of September 11, 2001, the issue of whether to provide weapons to flight crews has received considerable attention. While the concept has received strong public support, industry experts remain divided over the safety, security and effectiveness of such measures. With every weapon, there exists a risk of collateral injury, and the risk that the weapon can be used against the intended operator. Additionally, every type of weapon has unique properties that create unique challenges and opportunities. All weapons that will be considered for use on an aircraft will fall into two general categories: less-than-lethal and firearms.

Less-than-lethal weapons

Under section 126 of the Aviation and Transportation Security Act (P.L. 107-71), the Secretary of Transportation, with the approval of the Attorney General and the Secretary of State, may authorize members of a flight crew to carry less-than-lethal weapons in the interest of avoiding air piracy.

Less-than-lethal weapons can be divided among six categories: electrical shock (i.e. stun guns), chemical (i.e. tear gas or pepper spray), impact projectiles (i.e. rubber bullets), physical restraints (i.e. nets), optical, and acoustic. They are designed to temporarily incapacitate, confuse, delay or restrain an adversary in a variety of situations. They must strike a delicate balance between safety and effectiveness. In general, less-than-lethal weapons have a lower risk of accidental injury or death to innocent bystanders than lethal weapons.

The effectiveness of less-than-lethal weapons in an aircraft environment has not been widely studied. Aircraft are unique in the sense that air is re-circulated in a small space, critical flight safety-related instruments can be easily damaged, and passengers, crew and aggressors are confined together for the duration of flight. The risk of collateral injury is significantly higher under these conditions.

Among currently available less-than-lethal weapons, TASERS are widely regarded as potentially offering the most effective form of protection for passengers and flight crews. A TASER is a hand-held device that fires two gas-propelled (CO₂ or NO₂) barbs connected to trailing wires. When the barbs penetrate the subject's skin or clothing, the TASER discharges a high voltage (50,000 volts), low current (26 watt) electrical charge. TASERS have a maximum range of 15-21 feet, with a minimum range of approximately 3 feet, and are available in only one or two-shot models.

As long as the barbs make good contact, a TASER can instantaneously incapacitate its intended subject. The effects can last for several seconds and can be reactivated repeatedly as long as the wires remain intact and the barbs stay connected to the subject. Once the current flow stops, the subject generally recovers in less than one minute.

TASERS have not been cleared for use on commercial aircraft. However, United Airlines has purchased several hundred M-26 TASER guns and intends to install them in lockboxes in the cockpits of all their planes. The airline already is training

cabin crew and flight deck crew on their use.

Several issues require more attention before TASERS can be approved for use on an aircraft in flight:

- Effectiveness and countermeasures: According to FBI data, TASERS fail to incapacitate their intended subject in 15-30 percent of deployments. Counter-measures such as heavy clothing or makeshift shielding are readily available.
- Limited number of shots: TASERS are only commercially available in one or two- shot models. After a TASER has been fired, it cannot easily be reloaded. Some models can be used as direct contact weapons; however, such models would require some form of hand-to-hand combat to be effective.
- Multiple attackers: Since TASERS have a limited number of shots and a relatively short effectiveness period, they are not ideal weapons for use against multiple attackers.
- Lethal backup: In most situations where law enforcement officers use TASERS, lethal backup is readily available. Such backup will not be available on an aircraft in flight.
- Aircraft electrical systems: The effect of a high-voltage electrical discharge on aircraft electrical systems has not been widely studied. Significant research needs to be conducted.

Section 126 of the Aviation and Transportation Security Act (P.L. 107-71) directs the National Institute of Justice to assess the effectiveness of less-than lethal weapons to defend aircraft against acts of air piracy. The study has not been released to the public.

Firearms

Under section 128 of the Aviation and Transportation Security Act (P.L. 107-71), a pilot of a commercial air carrier may carry an approved firearm while operating an aircraft if he receives approval from the Under Secretary of Transportation for Security and his employer, and he has received proper training. The Transportation Security Administration has begun discussions on this issue with pilots groups, airlines and other interested parties; however, to date, no pilot has received approval to carry a firearm.

Despite widespread public support, arming commercial pilots remains highly controversial among industry experts and Federal authorities. Critics contend that allowing pilots to carry firearms would introduce new and potentially greater risks to safety and security. It would create a proliferation of weapons into sensitive, sterile and secure areas and provide opportunities for individuals with hostile intentions to gain control of a firearm that would not otherwise be available. There is concern over the high risk of lethal collateral damage from both accidental and intentional discharge, harming passengers, crew or critical aircraft parts.

Transportation Secretary Norman Mineta and Homeland Security Advisor Governor Tom Ridge have both made public statements against allowing pilots to carry guns. The airlines and other employee groups, while publicly remaining neutral, have privately expressed concerns.

Proponents point out there is a standing order to NORAD to shoot down any aircraft that has been over taken by terrorists. As a last line of defense, firearms remain the most effective deterrence and most effective means to retain control of an aircraft against air piracy. Supporters believe that other means such as emergency aircraft maneuvers or less-than-lethal weapons create even greater safety risks or are not universally effective. They contend that the risks associated with arming pilots are controllable or insignificant when compared to the potential catastrophe that could result from a terrorist gaining control of an aircraft. They also point out that certain foreign airlines currently have allowed pilots to carry weapons for years without incident. A recent poll by a pilots group of its members indicates that 73 percent of airline pilots support arming properly trained pilots with guns.

In addition to basic concerns, several other issues must be resolved before approval to carry a firearm into a cockpit of an aircraft can be granted. They include:

- Pilot qualifications;
- Type of firearm and ammunition;
- Length, frequency and intensity of training;
- Weapons storage aboard the aircraft;
- Pilot and air carrier liability;
- Method of firearms carriage;
- International legal considerations; and
- Vulnerability of aircraft to catastrophic collateral damage.

WITNESSES

PANEL I

[Honorable Sarah V. Hart](#)

Director, National Institute of Justice
Office of Justice Programs
Department of Justice

PANEL II

[Captain Stephen A. Luckey](#)

Chairman
National Flight Security Committee
Air Line Pilots Association, International

[Mr. Hank Krakowski](#)

Vice President
Corporate Safety, Quality Assurance and Security
United Airlines

Mr. Ron J. Hinderberger
Director, Aviation Safety
Boeing Company

STATEMENT
OF
THE HONORABLE SARAH V. HART
DIRECTOR
NATIONAL INSTITUTE OF JUSTICE
OFFICE OF JUSTICE PROGRAMS
BEFORE THE
SUBCOMMITTEE ON AVIATION
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
U.S. HOUSE OF REPRESENTATIVES
REGARDING
LESS-THAN-LETHAL WEAPONS
ON
MAY 2, 2002
WASHINGTON, DC

Mr. Chairman and Members of the Subcommittee, I am pleased to appear before the Subcommittee to discuss the work of the National Institute of Justice (NIJ) in developing and testing less-than-lethal weapons for use by commercial airline flight deck crew members in preventing and responding to on-board attackers and potential acts of terrorism. As you know, Mr. Chairman, the Aviation and Transportation Security Act,^[1] required NIJ to assess whether less-than-lethal weapons could be used by commercial airline flight deck crew members to temporarily incapacitate persons who present a clear and present danger to the safety of the aircraft, its passengers, or individuals on the ground. That Act required NIJ to submit its findings and recommendations to the Secretary of Transportation. NIJ submitted its report to Transportation Secretary Mineta on April 18, 2002.

As Congress directed, the focus of NIJ's report was on the use of less-than-lethal weapons in aircraft. As such, NIJ did not undertake an

examination of the efficacy of using lethal weapons in a commercial aircraft to thwart an attack. This testimony summarizes the major conclusions and recommendations of NIJ's report to the Secretary of Transportation.

While our report did discuss countermeasures or other steps that individuals could use to avoid or minimize the effectiveness of the less-than-lethal weapons discussed in this report, for security reasons, that discussion has been omitted from this testimony. I would be pleased, however, to provide this information to the Subcommittee in a closed session.

Moreover, the time constraint -- 90 days from the day the Act became law, or from November 19, 2001 -- set by Congress for NIJ to develop its report did not allow for scientific testing of less-than-lethal weapons in an aircraft setting. Therefore, NIJ prepared its report from information derived from its own research and development of these types of

weapons, as well as meetings with experts from the aviation industry and persons experienced in the design and use of less-than-lethal technology in other settings. NIJ's review of the scientific literature indicated that there are no published formal, scientific test results involving the use of less-than-lethal weapons in a commercial aircraft in flight conditions.

NIJ Less-Than-Lethal Weapons Development Program

Less-than-lethal weapons were developed to provide law enforcement, corrections, and military personnel with an alternative to lethal force. They are designed to temporarily incapacitate, confuse, delay, or restrain an adversary in a variety of situations. They have been used primarily in on-the-street confrontations and suicide interventions, but have also been applied in riots, prison disturbances, and hostage rescues. Less-than-lethal weapons are most often used when: (1) lethal force is not appropriate, (2) lethal force is justified but lesser force may subdue the aggressor, and (3)

lethal force is justified but its use could cause collateral effects, such as injury to bystanders or unacceptable damage to property and environment.

Research into less-than-lethal technologies has a long history in the Department of Justice. The first conference on the subject was convened by the Attorney General and the National Science Foundation in 1972. In 1986, then-Attorney General Edwin Meese convened a second national conference on less-than-lethal technologies in response to the U.S. Supreme Court decision Tennessee v. Garner^[2], which limited the permissible use of deadly force against felons.^[3]

After the 1986 conference, NIJ established a less-than-lethal technologies program. The first research award under this program was made in 1987 to the U.S. Army Chemical Research, Development, and Engineering Center at Aberdeen Proving Ground for a single project -- an assessment of the feasibility of a dart that could deliver a safe but incapacitating chemical to

a fleeing suspect. The project evolved to the identification of a candidate chemical and the production of a prototype delivery system. In 1992 NIJ's program was expanded to include the research, development, modeling, testing, and evaluation of all classes of less-than-lethal weapons to address a wide range of possible applications. Since then, NIJ has invested an average of \$1.5 million per year in the program. This year, NIJ will invest \$2.5 million in its less-than-lethal program.

Through this program, NIJ seeks technologies that provide new or significantly improved less-than-lethal options to law enforcement and corrections professionals to enable them to reduce the number of deaths and injuries to suspects, prisoners, officers, and bystanders. The program is also designed to evaluate the safety and effectiveness of less-than-lethal weapons through laboratory and field demonstrations, and through the development of computer simulations and mechanical models.

Typically, NIJ-funded projects in this area have focused on:

- I.Improving the safety of blunt-trauma projectile weapons;
- II.Improving the delivery accuracy and dispersal efficiency of pepper spray for barricade scenarios;
- III.Evaluating the safety and effectiveness of pepper spray;
- IV.Developing and evaluating technology useful for disorienting suspects; and
- V.Evaluating the safety and effectiveness of electrical shock weapons.

Use of Less-Than-Lethal Weapons in Commercial Aircraft

Based on its current report, *Less-Than-Lethal Weaponry for Aircraft Security*, NIJ has concluded that some less-than-lethal weapons, used in accordance with appropriate policies and training, have the potential to allow flight deck crews to thwart an attack in an aircraft. These weapons have the potential to interrupt an attack, control the aggressor, or delay an attack while the flight crew safely lands the plane. However, substantial testing is required

before informed decisions can be made as to whether these weapons should be deployed on commercial airlines.

The principal requirements for any less-than-lethal weapon are *safety* and *effectiveness*. There is, of course, a natural tension between these two requirements. As the safety of a less-than-lethal weapon is maximized (to protect even the most vulnerable individuals), it degrades the weapon's ability to incapacitate bigger, stronger, and more determined individuals. Similarly, if effectiveness is maximized (to incapacitate a large adult), then there is a higher risk to a smaller adult or a child. Thus, when the perpetrator's threat is low, safety becomes the dominant consideration in weapon selection.

However, when a perpetrator poses an imminent threat of death or serious harm to others, effectiveness becomes the dominant consideration. In the high-threat situation, safety considerations are pursued if they do not

substantially compromise effectiveness.

Aircraft hijackings are high-risk events. As a result, in assessing the appropriate weapons to be used in such a setting, NIJ weighed the balance in favor of effectiveness. This assessment is complicated, however, by the fact that commercial aircraft represent a new environment for the use of less-than-lethal weapons. Most less-than-lethal weapons are designed for use in an open setting or inside a house or other structure, so further testing of these weapons may prove their use inside an aircraft in flight to be impractical.

For example, in commercial aircraft, air is recirculated in relatively small spaces, sensitive critical flight instruments are in continual use, and passenger and crew spaces are crowded and confined. These factors may increase risks to innocent third parties and may increase the likelihood of harming flight crew members or critical aircraft systems. Future substantial testing is required to develop a more complete understanding of the potential

adverse effects of less-than-lethal weapons, especially when used in an aircraft under flight conditions.

In developing its assessment for the Secretary of Transportation, NIJ worked closely with representatives of the Federal Aviation Administration (FAA) and experts in the development and use of less-than-lethal weapons to identify the most likely desirable characteristics for a less-than-lethal weapon for flight deck crews. Based on these discussions, NIJ concluded that any less-than-lethal weapon for use on commercial aircraft should:

VI.Immediately incapacitate an aggressor. Slow-acting or partially effective weapons may not prevent a determined or trained aggressor from inflicting serious harm to the flight deck crew or critical instruments.

VII.Have quickly reversible and controllable effects. If flight crew

members are accidentally incapacitated by the weapon, they must be able to return immediately to duty.

VIII.Be usable in a confined space. Some existing weapons are potentially lethal or ineffective at short ranges. Flight deck crew may be unable to get into an optimal position for operating most existing less-than-lethal weapons.

IX.Be simple to operate. A hijacking can evolve rapidly and without warning and flight deck crew must be able to respond immediately and effectively. Extensive training should not be required.

X.Have multi-shot (use) capability. The first shot or application may not completely incapacitate the assailant or there may be multiple assailants.

XI.NOT damage critical systems. Damage to critical navigational or environmental systems could endanger the passengers and the flight

deck crew.

A Review of Less-Than-Lethal Weapons

There are six general categories of less-than-lethal weapons that currently exist or are in development: electrical shock, chemical, impact projectile, physical restraint, light, and acoustic. No commercially available less-than-lethal weapons have been customized for use on aircraft. In fact, most less-than-lethal weapons are designed for outdoor use. Each of these type of weapons and their potential use in an aircraft setting is discussed below.

Electrical Shock: There are two types of electrical shock devices that have potential use in commercial aircraft. The first is a handheld direct contact weapon that has two probes that are pressed against the skin (or clothing) of an aggressor. When the operator presses a switch, the skin

contact and pressed switch complete a circuit, and the subject receives a debilitating and possibly painful electrical shock. The second device, commonly referred to as a dart-firing electrical shocking device, fires two barbs connected to trailing wires that lead back to the operator. When the barbs penetrate the subject's skin or clothing, an electrical circuit is completed and an electrical discharge (similar to direct contact weapon discharge) automatically results.

One benefit of electrical stun devices is that they produce an immediate incapacitating effect. Direct contact stun weapons can incapacitate an aggressive individual by causing pain and loss of muscle control, but *only* while contact is maintained. This permits a quick recovery, but requires the user to remain in close and possibly dangerous contact with the aggressor.

The incapacitating effect of the dart-firing electrical shocking device can be instantaneous and last for several seconds. This is usually sufficient time to allow the subject to be properly restrained. The dart-firing electrical shocking

device also can be reactivated repeatedly if more time is required for restraint or backup.

Once the current flow stops, the subject recovers rapidly (generally in under a minute according to one manufacturer). One benefit of these weapons is that if flight deck crew members were inadvertently incapacitated with an electrical shock device, they could return to duty quickly once the current flow stops.

Another benefit of electrical weapons is that they can be used in a confined space. The maximum range of the direct contact weapon is the length of the arm of the person employing it. The maximum range of the dart-firing electrical shocking device is 15 to 21 feet. The barbs can be discharged at very close range, but the recommended minimum distance is 3 feet, according to the manufacturer. Effectiveness at shorter ranges is not known with any acceptable certainty.

In addition, these weapons are easy to operate. Both the direct contact and the extended range weapons are relatively small and can easily be carried and can be operated with only one hand. Preventive maintenance is critical to ensure that the power source is fully charged or replaced as necessary, and it is likely that the climate controlled environment of an aircraft would be ideal for optimal performance and maximum life of these battery powered devices.

The most important unknown fact about the use of these weapons, however, is the effect such a weapon could have on aircraft avionics or other critical systems. NIJ recommends that electrical discharge weapons not be deployed in aircraft until extensive, independent, and controlled testing has been completed. This testing should be in realistic settings in various types of aircraft to determine the effect that these weapons may have on critical

aircraft systems.

Chemical: Chemical less-than-lethal weapons have been used by law enforcement and corrections officers on individuals and crowds. They can range from traditional tear gas to pepper spray to anesthetics or calmatives. Most experts believe tear gas is not likely to be useful in aircraft because its effects generally cannot be adequately controlled in an aircraft cabin. Handheld dispensers of pepper spray offer better control, but still have limitations.

Some very determined and trained aggressors may be able to “work through” the effects of these chemicals. While their ability to move would be affected by these weapons, other means of restraint would be required before the effects of the pepper spray wear off. Also, the effects of these weapons are reversible, but not quickly, a factor that could prove problematic if flight deck crew members were accidentally affected.

Anesthetics or calmatative chemicals could, in principle, be developed into a system whereby they could be remotely released into the cabin in order to incapacitate all passengers, and the hijackers, until the plane can be landed safely. Chemical systems of this type have not been employed in the field, however, and remain under study or in development. Also, the effects of these chemicals are not rapid and so may not work fast enough to thwart an attack. Chemical agents used in the cabin may also create unacceptable risks to the health of vulnerable passengers (e.g., infants and those with asthma or other respiratory problems). Finally, the use of these weapons could prevent other passengers from assisting in immobilizing or restraining hijackers.

Impact Projectiles. Many variations of “rubber bullet” impact or blunt trauma projectiles exist. With these weapons, safety concerns from their use at close range are heightened over that of other less-than-lethal weapons.

Some of these weapons are relatively safe, even at short distances, and might be adapted for use in an airplane. However, the degree of incapacitation from these weapons varies greatly and the effect can wear off quickly. Moreover, existing versions of these weapons are not designed for use in confined spaces. They typically are launched from a pump-action shotgun or a single round tear gas gun that requires two hands to operate. As such, the weapon is large and not designed to be easily carried on a belt or in a pocket.

Physical Restraints: There are a variety of products that can be used to physically restrain or impede the movement of an aggressor. Although they are not often considered “weapons,” they are often used in conjunction with less-than-lethal devices and so were considered in preparing NIJ’s report to the Secretary of Transportation. These products include nets, surface chemicals, and handcuffs.

Net guns are not practical in the cabin area. Even the remote

deployment of a large net covering the cabin would not likely adequately incapacitate a determined and trained hijacker. An electrified net, a design that exists in a prototype (but not specifically for aircraft use), might increase the effectiveness of such a weapon in an aircraft, if it was completely controllable from the cockpit, but effects on aircraft instruments and other performance characteristics is unknown and would have to be tested.

Chemical substances exist that can be applied to surfaces to impede the movement of an aggressor. These substances can be used to make surfaces extremely slippery or extremely sticky, and could be remotely deployed in the cabin area by a flight deck crew member, making it difficult for a hijacker to control his movement on the aircraft floor. Of course, these materials would also affect the other passengers and crew should they come in contact with them, and thus could impede efforts to subdue the hijacker.

There is some question as to whether these substances could be deployed with

sufficient speed and accuracy to interrupt a fast-paced hijacking.

Handcuffs and flexible cuffs are commonly used physical restraint devices. They should be used in conjunction with any less-than-lethal weapon because these weapons usually produce only a temporary effect. Because it is essential that any potential hijacker or other aggressor be effectively restrained while the plane is landed and security forces arrive, the use of these devices should be part of a overall plan to thwart an attack.

Light: Bright white lights or lasers can produce a “wall of light” that may deter an assailant from attacking someone behind the light. To be truly disabling, however, the light source often requires power levels that may cause eye damage. Even at such a high power level, the device still may not prevent a determined perpetrator from using a weapon. A lower power level “eye-safe” device could be used to distract or delay the advance of the suspect. Such a device could provide sufficient time for passengers and crew

to protect themselves or restrain the aggressor. These weapons are still under development by the Department of Defense, with NIJ support.

Acoustics: Acoustic energy, at both audible and inaudible frequencies, has been examined for potential use in less-than-lethal weapons, primarily for halting the advance of an aggressive or violent crowd in a riot scenario. An acoustic source that produces "ear-splitting" audible sounds might be useful as a less-than-lethal weapon under certain circumstances, especially in an indoor environment where some of the technical obstacles are not as serious. These weapons are still under development by the Department of Defense, with NIJ support.

Conclusion

Based on its review of the six less-than-lethal weapon classes, NIJ draws the following conclusions:

XII. Electrical shock weapons (both barb-fired and direct contact

systems) show the most promise for use by the flight deck crew.

However, substantial systematic testing in realistic settings of their effects is essential to ensure they will not damage or disable critical flight systems. This testing must be conducted for each aircraft type in which the weapons may be used.

XIII.If flight deck crews are armed with any less-than-lethal weapon, handcuffs or other physical restraints should be readily available to incapacitate aggressors until the aircraft can be safely landed and police or security forces can arrive.

XIV.Impact projectile and physical restraint less-than-lethal weapons should also be considered for use, especially in the aircraft's *cabin*, where the restrictions on space are less severe and risks of damage to critical systems or injury to the flight crew are reduced. These weapons could be used as part of a multi-layered defense strategy designed to

slow the progress of a hijacker toward the flight deck.

XV. Each of these weapon types poses either safety or effectiveness issues that should be tested further in multiple aircraft settings before any deployment. Hence, testing of these products in commercial aircrafts, under conditions that closely approximate the conditions under which they could conceivably be used, should be performed to determine their operational characteristics in such confined spaces and any effects they may cause on aircraft systems. In addition, effectiveness and operational impact reviews need to be completed prior to deploying less-than-lethal weapons on commercial aircraft.

XVI. Modifications of existing less-than-lethal weapons may be necessary before they can be deployed in aircraft.

XVII. Light and acoustic weapons need more development, but may eventually be considered for use aboard an aircraft.

I trust these recommendations will be helpful to this Subcommittee, Mr. Chairman, as you work to determine the most effective means of protecting passengers, crew, and property on commercial aircraft. NIJ is committed to continuing to develop the tools that law enforcement needs in order to meet new and emerging threats to our homeland security. As part of this commitment, NIJ will continue its on-going research and development of less-than-lethal weapons, including their possible uses aboard aircraft.

NIJ's solicitation for applications for research grants in this area for Fiscal Year 2002 has recently closed, and the applications submitted are under review. NIJ has tentatively allocated \$1 million of its budget for the research grants to be made under this solicitation this fiscal year. In making these grants, NIJ intends to give priority to those applications deemed to be of high quality and that propose to develop less-than-lethal weapons for use in commercial aircraft. In addition, NIJ has committed \$1.5 million to further

development of ongoing less-than-lethal project. We trust that these research and development efforts will assist this Subcommittee, state and local policy makers, and law enforcement agencies throughout the nation develop effective responses to terrorist attacks on commercial aircraft.

[1] Public Law 107-71, Section 126(a).

[2] 471 U.S. 1 (1985).

[3] That case involved a 15-year-old Memphis boy who was shot and killed in 1974 while fleeing the scene of a \$10 burglary. In holding a Tennessee statute unconstitutional, the Court held, “The use of deadly force to prevent the escape of all felony suspects, whatever the circumstances, is constitutionally unreasonable. It is not better that all felony suspects die than that they escape. Where the suspect poses no immediate threat to the officer and no threat to others, the harm resulting from failing to apprehend him does not justify the use of deadly force to do so. A police officer may not seize an unarmed, nondangerous suspect by shooting him dead.” 471 U.S. at 11.

STATEMENT OF
CAPTAIN STEPHEN LUCKEY, CHAIRMAN
NATIONAL FLIGHT SECURITY COMMITTEE
AIR LINE PILOTS ASSOCIATION,
INTERNATIONAL

BEFORE

THE SUBCOMMITTEE ON AVIATION
COMMITTEE ON TRANSPORTATION AND
INFRASTRUCTURE

U.S. HOUSE OF REPRESENTATIVES

WASHINGTON, DC

MAY 2, 2002

ARMING FLIGHT CREWS AGAINST TERRORIST

ACTS

Air Line Pilots Association, Int'l
1625 Massachusetts Avenue, NW
Washington, DC 20036
(202) 797-4033

STATEMENT OF
CAPTAIN STEPHEN LUCKEY, CHAIRMAN
NATIONAL FLIGHT SECURITY COMMITTEE
AIR LINE PILOTS ASSOCIATION, INTERNATIONAL
BEFORE THE
SUBCOMMITTEE ON AVIATION
THE COMMITTEE ON TRANSPORTATION AND
INFRASTRUCTURE

UNITED STATES HOUSE OF REPRESENTATIVES

ON

**ARMING FLIGHT CREWS AGAINST TERRORIST
ACTS**

MAY 2, 2002

Good morning. I am Captain Stephen Luckey, chairman of the Air Line Pilots Association International's National Flight Security Committee. ALPA is the nation's largest pilot union, representing more than 66,000 pilots who fly for 43 airlines in the U.S. and Canada. Let me state from the outset that our views on an armed pilot program go beyond our own membership. The belief that arming pilots is a necessary security measure is also shared by the pilots of American Airlines, Southwest Airlines, UPS, Air Tran, and Airborne Express.

It is certainly a pleasure to be afforded this opportunity to present our views on the subject of arming pilots – it is an issue that has generated significant public debate and no small amount of misunderstanding about our recommendations. I am confident that we can build a strong case for our position today, which ALPA was the first to recommend to Congress in September 2001, and at the same time help to clear up some pervasive misconceptions surrounding this topic.

We applaud Congress for passing the Aviation and Transportation Security Act (ATSA) last fall that contained a provision for arming pilots and protecting the flight deck. However, more than five months have passed since that bill was signed into law and there has yet to be any action by either the airlines or the Administration to implement this important provision. For that reason, we are particularly pleased that Chairmen Young and Mica have introduced their legislation that will require the TSA to implement a federal flight deck officer program. ALPA strongly endorses and supports this bill and we urge Congress and the Administration to work together to ensure its passage.

Before getting into the remainder of my remarks about firearms, I would note that, while the arming of pilots has received a great deal of media attention, ALPA has been instrumental in the development of dozens of other security recommendations, many of which were included in the ATSA. Further, Capt. Woerth was selected by the Secretary of Transportation to participate in the DOT's Rapid Response Team on aircraft security and we provided dozens of proposals to that group that were included in the Secretary's final recommendations. We would be pleased to discuss our views on any of these topics today as well.

A Continuing Threat

I would like to offer a perspective on the need for arming pilots that perhaps you have not considered. Eight pilots were killed

on September 11th. The deaths of those eight pilots resulted in the transfer of aircraft control from authorized crewmembers to terrorists bent on destroying our country and its people. More than 3,000 people were murdered, billions of dollars of property damage was incurred, the nation's economy was rocked and is still suffering, thousands of people were laid off, and billions of dollars of new spending will be allocated to security both in this country and around the globe for years to come – all because eight pilots were killed. It is obvious, or should be, that protecting the flight deck and its occupants against hijackers is now tantamount to protecting our national economy. We are convinced that the ailing airline industry, which is still profusely hemorrhaging red ink, could virtually disappear if another successful attack is launched against us. If the airline industry takes another downward spiral, it most certainly will harm hundreds of businesses as well.

The real tragedy in all of this is that the hijackings of September 11th were avoidable. More than 40 years ago, during the height of the Cuban hijacking crisis, we called for strengthening flight deck doors and arming pilots, among other measures. In 1961, the FAA amended federal aviation regulations, with Congressional support, to permit pilots to be armed with the consent of their airline – the agency removed that regulatory language in July 2001. The Young/Mica bill will restore the framework of what was so recently removed from federal regulations. We have also, at long last, strengthened existing flight deck doors and the airline industry is in the process of purchasing and installing new, bullet- and fragment-resistant doors – for those improvements we are certainly appreciative.

To underscore the risks that we face, I would like to pose three questions and follow them with the answers. First, is there still a risk of terrorists assuming control of an airliner and crashing it into a building? The answer that we are hearing from the Justice Department, the Office of Homeland Defense, the TSA and numerous other sources is an emphatic “yes.” Transport aircraft, regardless of whether they carry passengers or cargo, must from now on be viewed as potential human-guided missiles if they fall into the hands of a suicidal terrorist. Osama bin Laden’s henchmen were remarkably patient, thorough, as well trained as any special operations unit in the world, and employed surprise attacks to great advantage using relatively innocuous weapons that they knew would go unchallenged through security checkpoints. From their perspective, the operation was a great success, not only in terms of damage, but also with respect to the amount of global media attention their acts garnered. History has shown that terrorists endeavor to repeat successes, so we must prudently assume that our enemies are planning for yet another airliner attack.

Second, if terrorists board an aircraft with the intention of hijacking it, will they be armed only with box cutters as they were before? We think that the answer to that is “probably not.” The element of surprise from a box cutter-type attack is gone and small knives are now confiscated at security checkpoints, so we must assume that terrorists will be armed with some other weapons, which could include guns not taken through screening checkpoints and/or undetected explosives.

We have an unfortunate habit in this country of preparing for the type of security breach that most recently occurred – this is the equivalent of locking the barn door after the horse is stolen. What we must do instead is address, to the best of our knowledge and ability, all of the potential threats that exist, not just those that we have most recently experienced. Many in the airline industry and some in government seem to believe that we should not prepare to counter anything but close-quarters combat by unarmed assailants. Such tunnel vision is foolhardy and leaves us pitifully unprepared for the various types of hijacking attempts that may well lie ahead.

Lastly, do we possess the will to do all that we can to avoid another catastrophe? I can tell you without equivocation that many pilots are willing and prepared to assume the responsibility for training and carrying a weapon. They are willing to do so as both a deterrent against hijacking attempts and as a means of preventing an attempt from becoming successful. With the support of Chairmen Young and Mica, and others who understand what is at stake, we are hopeful that the eventual outcome of this hearing will be a resounding “yes” – that Congress, on behalf of the American public, is also possessed of such a will.

You may be interested to know that I am one of about a dozen pilots selected in the mid-1970’s to be trained by the FBI to carry a firearm while performing my duties as a pilot. My airline’s president and the FAA approved that carriage to protect against the hijackings that were prevalent then. From my personal experience, I can tell you that I did not particularly

enjoy being armed during the 15 years that I carried a firearm – but it was a duty that I voluntarily undertook. The weapon was worn at all times, which is an inconvenience, and there was definitely an increased level of responsibility and restriction of my activity that went with being armed. However, I thought that it was necessary to be armed then, and I believe that it is even more necessary for qualified and properly trained pilots to be armed now. We could wish that our threat situation was such that it would be unnecessary for pilots to be armed, but the events of September 11th and the ongoing threat of further violence against airlines make it a necessity, in our view.

The Federal Flight Deck Officer Program

There are many misconceptions about what ALPA has proposed with its federal pilot officer program, which is synonymous with the program under consideration by this Committee. We have not recommended arming all pilots or making the arming of pilots a condition of employment. We have instead recently petitioned the DOT to write a proposed rule to implement ATSA Section 128, Flight Deck Security. In comments to the DOT, we have specifically recommended that a federal pilot officer program be created. The main provisions of such a program are:

- Ø *Volunteer to participate.* Only pilots who volunteer to subject themselves to individual scrutiny, intense security training, at least annual proficiency testing, and the

responsibility that goes with carrying a firearm would be allowed to apply for the program. Having carried a firearm on the flight deck, I know the challenges that must be met in order to make this program work. Stated another way, however, I know from firsthand experience that arming pilots can work and that doing so in 2002 will merely build on what has successfully been done before.

Ø *Be selected for training only after meeting strict, federal qualification standards.* Each pilot who volunteers to become a federal flight deck officer would be professionally evaluated, like other federal law enforcement officer candidates, to determine aptitude for carrying and firing a weapon, exercising judgment, using lethal force against an attacker, and other abilities. We do not expect that everyone who desires to be armed will be armed, due to the need to meet the very highest law enforcement standards. However, many in our ranks are former military and law enforcement officers, or have other pertinent qualifications, and are quite familiar and experienced with firearms. Those individuals will make excellent candidates as federal flight deck officers.

Ø *Undergo training, provided by a federal law enforcement agency, specific to protecting the flight deck.* Candidates should be provided approximately 48 hours of comprehensive training on all subjects pertaining to defense of the flight deck. These would include lessons on the law, the continuum of force, firearms training from a seated position and at close range, tactics and other related

topics. We have recommended setting the shooting proficiency standard at 100%, higher than any law enforcement officer is required to meet. Doing so will provide a very high confidence level by the TSA and the flying public that the federal pilot officer is prepared to protect the flight deck in the safest manner possible. The Young/Mica bill stipulates that the TSA implement and provide oversight of the federal flight deck officer program in consultation with the FBI's Firearms Training Unit. We believe that the TSA is a logical selection for these functions, given that it is responsible for writing and enforcing all aviation security-related regulations.

Ø *Be deputized as federal officers with jurisdiction restricted to the flight deck.* Pilots would be given jurisdiction only to make arrests and take defensive actions for acts of interference with, or assault upon, the flight crew in the flight deck. Deputization is paramount for two significant reasons: first, it places liability for the actions of federally trained officers on the government, thereby relieving airlines of such concerns; and second, it allows the individuals to transport weapons across state lines and international boundaries, as do other federal law enforcement agents.

The Young/Mica bill provides an excellent framework for creating a federal flight deck officer program; we hope to work with the TSA in the actual development of the program's particulars.

Reasons to Protect the Flight Deck with Federal Flight Deck Officers

Reasonable people may disagree about the need for arming pilots to protect the flight deck, but we are convinced that very strong arguments can be made in favor of creating the program outlined in the Young/Mica bill.

Ø *It would protect aviation's most important zone of defense – the flight deck.* The U.S. Secret Service provides protection to VIPs using what they refer to as zones of defense. A VIP is protected by the most concentrated forces within the innermost zone. The flight deck is the inner, and most important, zone of defense for aviation security. Security measures are needed to protect the outer zones, such as explosive detection equipment and better training, but they are not a substitute for protecting the inner zone. Ultimately, if a terrorist is able to penetrate other zones of defense and enter the flight deck, the pilots need the proper resource – in this case, a firearm – to respond forcefully and successfully to such a life-threatening emergency.

Ø *It may prevent the need for a U.S. fighter airplane to shoot down an airliner full of innocent passengers and crewmembers.* An illogical conundrum has been unintentionally created by the Administration's failure to act decisively to arm pilots. Pilots are not empowered to defend themselves against hijackers, but our own fighter

aircraft, sometimes flown by military reserve airline pilots, will be dispatched to shoot down an airliner if hijackers gain control of it. We believe that our pilots should be provided the resources that they need to defend themselves against terrorists so that they and their passengers are at less risk of being shot down by our own military.

Ø *It will create a high level of deterrence.* Once terrorists learn that the U.S. has decided to begin arming pilots, commercial aviation becomes a much less inviting target, which is exactly what is needed. Even if only a fraction of the flights have one or more armed flight deck officers, terrorists will be unable to determine which ones are not protected. Ultimately, this deterrence will also reduce the likelihood that a pilot will ever need to fire a weapon while on the aircraft.

Ø *The program will be highly effective and efficient.* The flight deck officer program will not require the creation of a new, paid workforce. We can think of no other countermeasure against hijackings that comes close to the effectiveness and efficiency of using pilots to defend their own workplace. No one has a greater interest in doing so, and no one will take it more seriously.

Ø *Pilots are exceptionally well-suited for protecting the flight deck.* We believe that no one is more highly qualified for protecting the flight deck than pilots. Pilots are undoubtedly the most highly scrutinized employees, submitting to a battery of pre-employment evaluations, a

flight physical every six months, random drug and alcohol testing, and a criminal history records check, among other formal examinations. Additionally, pilots are constantly interacting with and undergoing *de facto* monitoring by their airline's management, their peers, FAA personnel, and others.

Pilots' high level of discipline, attention to detail and ability to adhere to strict, standardized protocols lend very favorably to proficiency in safe, firearms handling. Furthermore, many pilots have former law enforcement or military backgrounds. We doubt that anyone is prepared to raise a reasonable concern about arming an airline pilot who formerly served as an FBI special agent or decorated special forces operative – these are the kinds of individuals who are prepared to serve as flight deck officers.

Ø *The public supports it.* Numerous polls of the general public have been taken to gauge support for arming pilots. Each of the polls that we have seen has indicated a high level of approval for letting pilots defend themselves in their workplace. This is in spite of the fact that the citizenry has little, if any, knowledge of the safeguards that will be built into this program. Returning the airline industry to strong profitability and growth depends on bringing passengers back to the airplanes. Passengers are unlikely to return to pre-September 11th traffic and fare levels unless and until they are confident about security. The passengers will not gain that confidence until they see evidence that pilots express the view that they are well

equipped to counter any hijacking attempt.

Rebuttals to Arguments Against Arming Pilots

It has been our experience that the more an individual knows about ALPA's proposal to arm pilots, the more likely they are to support it. We have found this to be true even within our own ranks. Those who are unfamiliar with our recommendations have raised several arguments against arming pilots that deserve to be addressed. Following are a few of the more commonly raised arguments against a flight deck protection program, and our answers to them.

Ø *New cockpit doors make arming of pilots unnecessary.*
The newly designed, enhanced security doors that are required by the FAA are not yet installed on the U.S. airline fleet, and that task will not be completed until April 2003. Neither the current cockpit doors (with interim measures in place to strengthen them) nor the new cockpit doors are impenetrable, and we are convinced that a team of trained terrorists could well decide to prove that point. Furthermore, airliners will have only one hardened cockpit door – a door which must be opened during flight to enable the pilots to use the lavatory and gain access to the passenger cabin as required for other purposes. Any passageway into the cockpit, no matter how well fortified, still holds the potential of a threat to the flight deck.

It is worth noting that the respected airline, El Al, uses two

doors on all of its aircraft to protect the flight deck, along with a team of air marshals on each flight and an armed guard who protects an entrance zone in front of the door near the passengers. Per El Al procedures, the doors are never opened simultaneously to help ensure that unauthorized access to the flight deck is denied. While we strongly support the installation of a new, hardened flight deck door on U.S. aircraft as an additional layer of security, we should not fool ourselves into thinking that they are sufficient to protect the flight crew under all circumstances.

Ø *The cost of arming and training pilots is too high.*

There is no question that there will be some expense associated with training pilots and equipping them with firearms. The program that we envision would require 48 hours of intensive training with recurrent proficiency training to be conducted at least annually. However, from the research that we have done on this issue, the cost of training and equipping pilots to carry firearms is the most efficient and cost-effective measure that the airlines can take to guard against further hijackings, bar none. In fact, these costs will be a mere fraction of the billions proposed for other, less effective security enhancements. The Young/Mica bill even proposes that the government pay the cost of training, which relieves the airlines from any cost concerns. Lastly, we must consider how many billions of dollars have been drained, and will be drained, from the national economy because airline pilots were not armed on September 11, 2001.

Ø *Airlines face liability if an armed pilot makes a mistake.* This concern was satisfactorily addressed by those airlines that allowed some of our members to fly armed for many years, when it was still permitted under the federal aviation regulations. We believe that the federal government's deputization of federal flight deck officers will virtually eliminate this concern and place the liability burden on the government, where it belongs. We would also question whether airlines are prepared to face a charge of negligent liability for opting *not* to arm their pilots, should terrorists ever again assault another flight crew inadequately equipped to defend the flight deck of their aircraft. The bill under consideration provides for elimination of liability for both pilots and air carriers as part of the flight deck officer program.

Ø *Pilots are too busy flying the aircraft to use a gun.* Pilots are trained to do numerous tasks simultaneously – individuals who cannot do so are unable to become airline pilots. One of the tasks that they must be prepared to perform is using fire extinguishers if a fire breaks out in the cockpit, regardless of other pressing duties. A suggestion that pilots should ignore the fire and continue to fly the aircraft would be ludicrous; yet some have suggested that pilots should ignore terrorists breaking into the cockpit and continue to fly the aircraft. This is utter nonsense.

Ø *An accidental discharge could damage the aircraft and/or injure someone.*

This country made a decision approximately 40 years ago that use of firearms by airborne federal officers was necessary to protect against hijackings. Some of the arguments that have been raised against arming pilots must, to be consistent, also be raised against armed Federal Air Marshals (FAMs), namely: bullets could pierce the fuselage and cause rapid decompression; an accidental discharge could injure or kill someone; or, an aircraft system could be damaged by gunfire. We have, rightly so, made a decision to accept those potential outcomes as manageable risks because there is a need for an armed law enforcement presence onboard the aircraft. No one has more knowledge of what can happen on the aircraft, nor will anyone be more conscientious about using a firearm onboard, than the pilot.

Further, contrary to Hollywood movie depictions of aircraft exploding in midair as a result of the discharge of a firearm in the cabin, virtually no danger exists that multiple gunshots could cause rapid decompression of a transport-category aircraft. The shooting proficiency that we recommend for the flight deck officer program exceeds that of federal law enforcement agents in order to minimize the possibility of a stray round hitting an innocent passenger or crewmember. If a weapon did cause rapid decompression during a struggle for control of the aircraft, that event would pale in comparison to the plane crashing into a building and killing all on board.

Ø *Federal Air Marshals (FAMs) on airliners make arming pilots unnecessary.* ALPA is a strong supporter of the FAM program, and we envision the flight deck officer program as an extension of the FAMs. However, the number of FAMs is limited and will certainly never be sufficient to provide protection on each flight. A large band of terrorists could overpower the FAM team – difficult though that might be – and turn its attention to the flight deck, using the FAMs' weapons. Ultimately, the flight crew must be able to defend the cockpit regardless of what other resources may be in the cabin.

Ø *We need to keep guns out of airplanes.* Incredibly, even a former high-ranking transportation official recently expressed this view on television. The truth is that law enforcement officers carry many weapons on our airplanes every day of the year with very few problems. Many of our members are former military and/or law enforcement officers who have defended this country and its neighborhoods using firearms. To suggest that these brave men and women should not be entrusted with lethal means to defend the flight deck against a lethal threat is, intentional or not, highly insulting to them. The argument to keep guns out of airplanes is also nullified by our nation's decision to place armed FAMs on flights, as we have already said.

Ø *No more terrorist attacks like those experienced on September 11th will occur.* This sentiment is merely wishful thinking and cannot be substantiated. In fact, the

intelligence community and the TSA strongly indicate that the threat to aviation is still very high.

Federal Flight Deck Officer Program Specifics

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The Young/Mica bill calls on the TSA to develop the specifics for arming pilots in consultation with the FBI's Firearms Training Unit. We certainly support that provision. In anticipation of the program's development, we would like to offer some preliminary recommendations on pilot selection and training, tactics, and weapon carriage and stowage.

Selection and Training

- Ø In concert with ALPA's One Level of Security goal, the program should be available to every commercial airline pilot, regardless of the size of the aircraft or whether it carries passengers or cargo. No arbitrary limits should be placed on the number of pilots allowed to fly armed.
- Ø Weapon custody policy should be designed to be as practical as possible, while accomplishing the goal of effective lethal force cockpit protection.
- Ø Pilots volunteering for the program should be chosen in a manner similar to that used to select any federal law enforcement officer, including suitability for application of lethal force.
- Ø Training should include instruction on basic safety, weapon maintenance, retention, liability, force continuum and other appropriate subject matter, as is provided to federal law

enforcement agents.

Ø Training should be limited to the scope of protecting the flight deck.

Ø The live-fire portion of training should be designed for the surgical application of lethal force at distances appropriate to protecting the flight deck.

Ø Flight deck-specific Fire Arms Training Scenarios (FATS) should be created to provide virtual shoot/no-shoot exercises to help teach the student judgment concerning use of the weapon.

Ø Simunitions (i.e., high-tech paint ball shot from a firearm) training, which is used by the FAM program, should be provided for live “perpetrator” assaults in a cockpit simulator using modified versions of the officer’s actual firearm. This realism would be an excellent tool for building confidence and teaching judgment.

Ø All training required by the program can be accomplished in a week, with approximately 48 hours of instruction.

Ø The firearm should be individually issued and available for training and proficiency. Pilots will be encouraged to maintain proficiency on their own time. Shooting proficiency re-qualification should be conducted at least annually, but semi-annually is preferred.

Ø The care of the firearm should be the responsibility of the individual, with the exception of parts replacement and other periodic armory maintenance.

Tactics

- Ø The firearm is viewed as an additional, essential piece of emergency equipment. The pilot should be trained to a demonstrated level of proficiency.
- Ø The firearm will be deployed in the same fashion as any other piece of emergency equipment. In accordance with standard operating procedures, the pilot not flying (PNF) will be responsible for responding to a terrorist attack and the pilot flying (PF) will fly the aircraft.
- Ø The firearm will be used exclusively to defend the flight deck.
- Ø Training will include different types of tactical responses, to reflect the types of assaults that may be encountered.
- Ø Lethal force will be used with surgical precision against assailants who are at very close range. Multiple assailants wearing some type of body armor will be expected and tactics appropriate to defend against such individuals will be deployed.

Weapon Carriage and Stowage

- Ø There are many types of holsters and other retention devices available, depending on the selected tactical approach. The chest pack appears to be a practical solution for rapid deployment and comfort. There is an accommodation for an additional magazine in this device.
- Ø The standard method of weapon custody by law enforcement agencies calls for the individual to carry the weapon on his person at all times. This may not be the most practical approach for pilots, considering the limited scope of

flight deck protection and the implication of carrying the weapon frequently while deadheading. ALPA has suggested that firearms could be stored on the aircraft, in airline flight operations areas or carried at all times. Airlines, with pilot input, should determine what type of weapon carriage works best for their operation. This may be dependent on the type of aircraft flown and other variables.

Ø FAMs use a locked box to store their weapons while laying over on international flights. Such a storage paradigm may be useful for airline pilots, who already store their flight bags in operations facilities at overnight airports.

Ø Protection against accidental discharges (ADs) is a primary consideration and must be kept foremost in mind for purposes of training, weapon selection and stowage decisions.

Ø Most ADs occur when the status of the weapon is checked or changed, primarily when loading and unloading. Maintaining the weapon in operational status has historically proven to be the safest option.

Ø The firearm should be available for practice and proficiency training for the pilot.

Ø There are several options available to address the challenges inherent in weapon carriage. There are devices that render the weapon into non-gun status, plus locks and containers designed to limit access to them by unauthorized persons.

Ø International operations require separate considerations. Some or all of these may be solved by means of bilateral agreements currently in place and used by FAMs.

There is obviously more that can be said about the flight deck officer program and we will be happy to provide specific information on request.

Thank you again for the opportunity to appear today and I will be happy to respond to any questions that you may have.

STATEMENT OF CAPTAIN HENRY P. KRAKOWSKI
VICE PRESIDENT – SAFETY, SECURITY & QUALITY
ASSURANCE
UNITED AIRLINES
BEFORE THE HOUSE AVIATION SUBCOMMITTEE
MAY 2, 2002

Chairman Mica, Ranking Member Lipinski and other Members of the Subcommittee, on behalf of United Airlines thank you for the opportunity to submit testimony concerning safe and secure cockpits. United Airlines enjoys a history and reputation of leadership in aviation safety and security initiatives. We believe our decision to acquire and train our crewmembers with the ADVANCED TASER M26 weapon represents such innovation and initiative. The purpose of this submission is to describe why we chose the ADVANCED TASER project as part of our overall security enhancement, and to urge the DOT, TSA and FAA to give serious consideration to approving it's certification.

Immediately after September 11th, United and the industry focused on cockpit security including reinforcing the cockpit

door, re-evaluating onboard procedures as well as researching various ways to stop an aggressor. There was an immediate call for arming pilots and while attractive at first, the more we as an airline thought through the ramifications we felt compelled to explore what non-lethal options might be available. We looked at everything from chemical sprays and sticky foam to collapsible batons as well as the ADVANCED TASER itself. Since we knew the firearm issue would be controversial, take time to study and create other safety concerns, we were convinced that the ADVANCED TASER represented the best overall solution as part of a comprehensive security-training program. We have chosen to purchase (2) ADVANCED TASERs for each airplane and propose to deploy them strictly for use in defending the cockpit. They would not be deployed in the passenger cabin.

TASER stands for Thomas A. Swifts Electrical Rifle. The ADVANCED TASER M26 is third generation technology that resembles a handgun. It can be used two ways – the first by shooting two probes up to 21 feet into the attacker administering

a 26-Watt cycle of electricity. This powerful electrical current causes electro-muscular disruption – incapacitating even the most motivated subjects. The second method is it's powerful touch stun effect. Simply holding the muzzle of the ADVANCED TASER against the subject like a conventional stun gun. This effect is considered non-lethal and is safe for use on people even with pacemakers.

There are two air cartridges per ADVANCED TASER allowing up to four firings with probes and the batteries provide up to 120 5-second cycles in succession. If shot into any part of the body, the person is immediately disabled during the electrical cycle while the attacker loses voluntary motor-muscle control.

The weapon has the unique advantage of effectively stopping an attacker without being life threatening, if fired into the wrong person, fellow crewmember or even critical instrumentation.

This is one of our primary concerns in the cramped and restricted cockpit environment with people in close proximity to each other. Since airline crew are now trained and passengers are willing to physically get involved and stop an attacker, this non-lethal capability provides a unique level of safety for those

very people who are assisting in the response. We believe the non-lethal concept also addresses the crossfire threat to armed Federal Air Marshals and other Law Enforcement personnel who may respond to an onboard threat. We have a recent example of how the ADVANCED TASER could have been effective had it been available.

Since September 11th, there have been two physical attempts to gain entry to a cockpit, both by mentally unstable passengers – not terrorists. On February 6th of this year United flight 855 from Miami to Buenos Aries was one of these attempts. Even with the door bar installed, a passenger was able to compromise the cockpit door and began to crawl on the floor into the cockpit. One of the pilots had to get up out of his seat and use the crash axe to defend the cockpit. Because of the position of the attacker, our pilot had to be very careful not to hit himself, the other pilot or hit vital control panels in the cockpit with the fire axe. Therefore, he was not able to use the axe effectively and never fully subdued the attacker. Passengers and other

crewmembers came to the rescue and pulled the attacker away from the door. This is an important point. Crewmembers and passengers in the cabin began to swarm around the attacker about the time the axe was being used. A TASER weapon would have done a number of things. First, both pilots could have stayed at their control stations, which would have allowed control of the aircraft even if one of the pilots, were disabled. If used as trained, the ADVANCED TASER would have immediately immobilized the attacker without fatally endangering others who were trying to help. In this case, the shot would have been towards the floor. A standard firearm being aimed in this manner might have shot through the cockpit floor into the electronics bay underneath the airplane or worse ricocheted into the passenger cabin itself. Certainly, the ADVANCED TASER would have been an improvement over the medieval tool used by our pilot that evening.

Conceptually, the use of non-lethal or even lethal weapons would only occur if the airplane itself were in jeopardy, presumably by terrorists. Yet to fully understand the safety

implications of installing any of these weapons, we must fully consider the possibility of 1) accidental discharge (current statistics from large U.S. Police departments indicate every year there is 1 out of 1000 firearms that are accidentally discharged – and this is by trained law enforcement officers who carry these weapons on a daily basis); 2) The weapon being taken away from the crew member and used to create a hostage situation using the weapon to gain compliance or; 3) A mistake -- a fellow crew member or innocent passenger or helper is shot in the “heat” of battle in the confined cockpit area. This would include the concern for the effect of the weapon system on aircraft structures , electronics or “fly by wire” flight control systems.

Concerning the aircraft, United has a reputation of having a world-class engineering department and we tasked them to evaluate the safety of the ADVANCED TASER. We have included a summary of the report in our submission, and have provided the full report to the TSA and Federal Air Marshal service. We test fired the ADVANCED TASER into live cockpits, control panels and electrical panels and accomplished various

tests on of every aircraft type we fly. We also did extensive flight-testing with an Airbus A319, the most sophisticated electronic airplane in our fleet. In short, the ADVANCED TASER passed with flying colors and the opinion of analysts is that, “Engineering believes the M26 to be suitable for use in an emergency situation on commercial aircraft with no effect on airworthiness of the aircraft.”

Aviation is an intensely human enterprise and as such, human factors continue to be the primary reason for loss of life and property. In this context, whatever steps are taken to enhance airline safety and security must consider the likelihood and severity of any safety threat versus the unintended consequences of mitigating that threat. Certainly, there are both advantages and limitations to any weapon and this is true for both firearms and TASERs. Sound procedures and training is key to effective use.

Our proposed deployment would make the ADVANCED TASER

an actual piece of aircraft equipment, similar to an onboard fire extinguisher. Rather than issue the weapon individually and have the crew carry it on and off the airplanes, through checkpoints, to and from layovers – we will have the TASERs locked in a combination-controlled box in each cockpit. Prior to each flight the two TASERs would be removed from the box and holstered next to each pilot for rapid use. There are strict control and accountability procedures for maintaining and pre-flighting the weapon. Any use, intended or unintended would be scrutinized by a “firing board” using our Flight Safety Investigation protocol. Our proposal of “federalizing” the weapons as aircraft equipment addresses jurisdictional issues in states and countries where TASERs or other weaponry are illegal. We have specific and confidential tactics developed with expert consultants who served with the US Secret Service. With this training and these tactics, we believe we have the ability to stop multiple terrorists attempting a cockpit takeover.

United’s training is very specific – the ADVANCED TASER is used to disable the attacker so they can be easily immobilized

with various traditional restraint devices like handcuffs. Unlike firearms, one aspect of the ADVANCED TASER that is particularly attractive is the ability for every pilot to easily train and qualify on its use. Our experience of training 7000 of our 9500 pilots thus far confirms this. Of some surprise and affirmation, we are finding overwhelming approval of both the security training itself with a 97% approval rating, as well as the use of the ADVANCED TASER by our pilots, many of who have changed their opinion from that of the firearms option. This is especially true of those 74 of our pilots who volunteered to be shot with TASER. All were immediately disabled, suffer no residual issues and universally do not want to experience this again. Moreover, the pilots who have never fired a gun before are impressed with the ease of using the ADVANCED TASER as they have no recoil when fired. Of the 6+ hours of training, only the last 2-hours concerns the ADVANCED TASER. This is important in that the TASER represents only a part of the procedures we are using to stop aggression on our airplanes, using coordinated procedures with defined levels of threat and response. Moreover, with TASERs, every pilot will be on the

same page in terms of expectation and coordination of a response threat. We have concerns that a small minority of pilots with weapons might destabilize the execution of a crew-coordinated response.

United also believes that, while the FAA/TSA mandated fortress doors are a long overdue improvement in cockpit security, the need for some additional protection in the form of a physical secondary barrier or secondary barrier procedures would be appropriate and should continue to be evaluated. Pilots have to eat and take physical breaks. During these times, the strongest door is no protection when it is open. Our new security training accounts for this with the ADVANCED TASER being an integral part of threat mitigation during these times.

Three other domestic airlines have decided to move forward with the ADVANCED TASER, American Trans Air and Mesa Airlines. Korean Airlines and two other international carriers have them in use today. In fact, the U.S. Air Force in providing

onboard security during the Afghan detainee transfer to Guantanamo Bay, Cuba used the ADVANCED TASER. It is widely used by law enforcement, prison security and for personal protection.

The country and industry is already funding the development of multiple layers of security including enhanced passenger screening, baggage scanning, physical airport security and a welcome increase of the Federal Air Marshal presence on our airplanes. Adding a layer of cockpit weapons must be considered as an integral part of the increased layers of security already being planned, deployed and funded.

Mr. Chairman, I can assure everyone here that United Airlines would never consider any approach that would lessen overall safety to our passengers and employees. We have full confidence in our belief that, together with effective crew training and procedures, the ADVANCED TASER represents a balanced solution that would be present in every United cockpit. The airline stands ready to work with the FAA, TSA or any

governmental agency to demonstrate the soundness of our approach, and we would welcome any agency that would want to observe our training and deployment in person.

United Airlines – TASER M26 Engineering Testing

Results

(Excerpts from Master Report)

B777 ground test – passed all testing

B747 ground test – passed all testing

B737 ground test – passed all testing

B757 – B767 ground test – passed all testing

A320 / A319 ground test – passed all testing

A320 / A319 flight test – passed all testing

The crew monitored all aircraft systems and indications during the flight. No abnormalities were noted. A post flight maintenance report, that provided the status of the aircraft, was printed. No problems attributed to the operation of the Taser were noted.

Flight Deck Component Testing – passed all tests, no permanent failure modes

This testing was conducted to record the effects of an accidental discharge of the Taser into the flight deck component. This is to support the analysis that was accomplished. The likelihood of this occurring is extremely low. The testing included panels and instruments (such as the IDUs and overhead instrument panels) that are positioned such that the potential for a probe to contact

and remain in place to allow a discharge is extremely remote. None of the system effects noted would compromise the ability of the crew to continue to safely control the aircraft.

Ground and Laboratory Testing of M26 Advanced Taser

The M26 Advanced Taser exceeded the allowable levels of RTCA DO-160D for Category M devices in laboratory testing, but proved to have negligible effect on electrical and electronic equipment during aircraft testing. (Only one instance of a slight popping was heard on various VHF Comm frequencies on the A320.) Accidental discharge of the Taser across or through the flight deck components does not result in significant damage or loss of function of these systems. With the positive results of the aforementioned tests, and given the severity of events leading to an actual in-service use of the device and potential ramifications of those events, Engineering believes the M26 to be suitable for use in an emergency situation on commercial aircraft with no effect on airworthiness of the aircraft.

ADVANCED TASER® SUMMARY WITH Q&As

Synopsis: The ADVANCED TASER® M26 is the only less-lethal weapon that can stop a truly aggressive, focused, combat trained attacker.

Time to Complete Incapacitation: 0.25 seconds.

Range: 21 feet police, 15 feet commercial

Method of Incapacitation: Electro-physical, involuntary contraction of skeletal muscle tissue. Overrides the motor nervous system, blocking command & control of the human body. Existing stun systems stimulate sensory neurons and can be over-ridden by a focused individual. The ADVANCED TASER directly stimulates motor nerve and muscle tissue, causing incapacitation regardless of mental focus, training, size, or drug induced dementia.

Long-term injuries: None.

Short term injuries: Minor skin irritation.

Data Port System:

- The M26's on-board memory can download the time and date of its most recent 585 to protect officers from unfounded charges of misuse of force.
- The M26 is available with an option to remotely fire the Air Cartridge from underneath a rifle, robot, tactical mirror on a pole, camera, etc.

Sighting System:

- Ergonomic design tested by over 1,000 law enforcement

trainers. Average distance from aim point (without using physical sight) was less than 1.5 inches.

- Physical sight on top of weapon for optical alignment. (Front sight post and rear sight posts.)
- Built-in laser sighting

Power Supply: AA Nickel-Metal Hydride batteries 1.2 Volts

AA Alkaline (Duracell® Ultra) batteries 1.5 Volts

Air Cartridge: Compressed nitrogen (1800 lb./in²).

Cartridge Shelf life: 5 years.

Weight: 18 ounces. including batteries and Air Cartridge

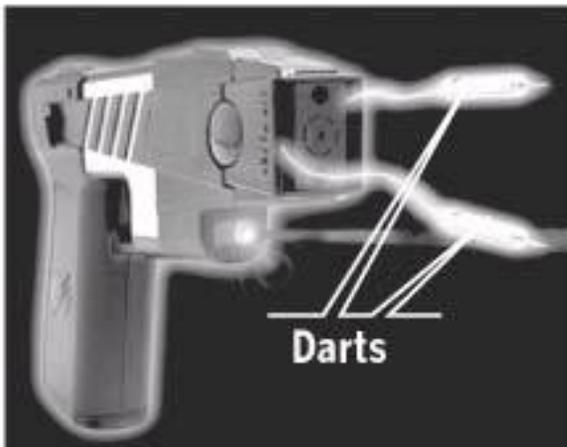
Energy: Power: **26 Watts**; Per Pulse: **1.76 Joules**; and Amps: **162mA Irms**

Training: The ADVANCED TASER uses the same hand motions and muscle memory as standard semi-automatic pistols, drastically reducing the amount of time required to train and increasing accuracy under stress. Recommended user training is 4 hours, instructor training is 8 hours.

HOW DOES AN ADVANCED TASER WORK? Upon firing, compressed nitrogen projects two ADVANCED TASER® probes 15 or 21 feet (depending on cartridge) at a speed of 180 feet per

second. The probes are connected by thin insulated wire back to the M26. An electrical signal transmits throughout the region where the probes make contact with the body or clothing. The result is an instant loss of the attacker's neuromuscular control and any ability to perform coordinated action. ADVANCED TASER uses an automatic timing mechanism to apply the electric charge for 5 seconds.

How the Advanced Taser works



Fire: The Taser fires two darts up to 21 feet.

Strike: The darts are connected to the weapon by wires and attach themselves to an assailant's skin or clothing.

Shock: When the darts hit the assailant, the Taser sends a powerful shock through wires and into the assailant's body, incapacitating him. The shock can penetrate 2 inches of clothing.

Source: Taser International

Gannett News Service

HOW CAN THE ADVANCED TASER BE SO EFFECTIVE YET NON-INJURIOUS?

The ADVANCED TASER does not depend upon impact or body penetration to achieve its effect. Its pulsating electrical output interferes with communication between the brain and the muscular system, resulting in loss of control. However, the ADVANCED TASER is non-destructive to nerves, muscles and other body elements. It simply affects them in their natural mode. More importantly, no deaths have ever been directly attributed to the TASER®.

DOES THE TASER AFFECT THE HEART OR A

CARDIAC PACEMAKER? The ADVANCED TASER's output is well below the level established as "safe" by the federal government in approving such devices as the electrified cattle fence. In a medical study, Dr. Robert Stratbucker tested the M26 at the University of Missouri and confirmed that the T-Wave does not interrupt the heartbeat or damage a pacemaker. Any modern pacemaker is designed to withstand electrical defibrillator pulses that are hundreds of times stronger than the ADVANCED TASER's output. The ADVANCED TASER current of 1.76 Joules is well below the 10-50 joule threshold above which cardiac ventricular fibrillation can occur.

ISN'T HIGH VOLTAGE LETHAL? High voltage, in itself, is not dangerous. One can receive a 25,000-volt shock of static electricity from a doorknob on a dry day without harm. The physiological effect of electrical shock is determined by: the current, its duration, and the power source that produces the shock. The typical household current of 110 volts is dangerous because it can pump many amperes of current throughout the body indefinitely. By contrast, the ADVANCED TASER power supply consists of 8 AA alkaline 1.5-Volt batteries capable of supplying 26 Watts of electrical power for a few seconds.

WILL THE TASER CAUSE ELECTROCUTION? No. The output is metered by the electronics and the electrical energy in each pulse is always the same, regardless of the target condition. The electrical output will not be transferred from one person to another even if they touch. Over 1,000 individuals have personally tested the ADVANCED TASER.

WHAT ARE THE AFTEREFFECTS? A person hit with an ADVANCED TASER will feel dazed for several seconds. Recovery is fast and the effects stop the very instant that the

M26 shuts off. Some will experience critical response amnesia and others will experience tingling sensations afterwards. The pulsating electrical output causes involuntary muscle contractions and a resulting sense of vertigo. It can momentarily stun or render immobilized. Yet, the ADVANCED TASER's low electrical amperage and short duration of pulsating current, ensures a non-lethal charge. Moreover, it does not cause permanent damage or long-term aftereffects to muscles, nerves or other body functions. A January 1987 Annals of Emergency Medicine study reported that similar TASER technology leaves no long term injuries compared with 50% long term injuries for gun shot injuries.

- **MUST THE PROBES PENETRATE THE BODY TO BE**

EFFECTIVE? No. The electrical current will "jump" up to two inches as long as both probes are attached to clothing or skin. At most, only the 3/8-inch needlepoint will penetrate the skin. They have less energy than a spring propelled BB. Both probes need to contact the body or else contact clothing and be within two inches of the body to stop an attacker.

- **WHAT IF THE PROBES MISS?** The ADVANCED TASER can work if one probe hits a human and the second falls on grass or dirt as the power grounds. However, the results depreciate substantially if the second probe lands on concrete, asphalt or not all on wood floors. Otherwise, the M26 can be used in a touch-stun mode. The user is thus provided with two backups. A secondary Air Cartridge is available that holds a backup cartridge below the ADVANCED TASER's handgrip. A final backup if the probes miss the target is the touch stun feature. Should the user miss or engage a second attacker, the ADVANCED TASER can applied directly to the target and it will work like a powerful touch-stun device.

CAN THE ADVANCED TASER CAUSE FIRE? The

ADVANCED TASER will not ignite standard solids or even black gunpowder. However, the spark from an ADVANCED TASER can ignite some flammable liquids, vapors, meth labs or sensitive explosives. The ADVANCED TASER should not be used anywhere that cigarettes are forbidden for fire safety reasons. The ADVANCED TASER should never be used on anyone who has been sprayed with an alcohol based chemical spray – including some alcohol based pepper sprays -- which could ignite.

WHAT ABOUT THE POTENTIAL OF EYE INJURY FROM THE ADVANCED TASER? The ADVANCED TASER should always

be aimed at the attacker's chest or back, since both probes need to hit some part of the body to be effective. The torso provides the largest surface area to hit. *The ADVANCED TASER should never be aimed toward an attacker's face.* This is a serious self-defense device and should be treated as such. Moreover, putting any sharp object into an eye is potentially dangerous to the cornea.

HOW WILL THE ADVANCED TASER PREVENT CRIMINAL USE?

Our mission is to ensure technology can play a positive role in our society. To that end, an Anti-Felon Identification (AFID) system is used so criminal use of the ADVANCED TASER can be traced from evidence dispersed by the device itself to provide the exact identification of the Air Cartridge purchaser. No other self-protection device in the world -- guns, chemical and pepper sprays, touch-stun devices or batons -- can be traced from evidence at the scene of the crime directly to the registration of the user.

WILL THE PROBES STICK TO BULLETPROOF VESTS?

Some bulletproof vests are made specifically to stop only bullets and gun shot projectiles -- not knives or sharp devices such as syringe needles. Should the probes attach to clothing in front of the soft body armor, the T-Wave can penetrate some of these vests with near full-effect. Although most bulletproof vests are made to stop bullets, the vests are porous and will not stop the flow of electrons. A bulletproof jacket with metal shock plates can cause the probes to bounce off the target. However, some companies have reported that there is soft body armor that has filled the porous material with rubber and/or plastics, which may prevent the T-Wave from penetrating the body armor. Twaron® is difficult for the TASER-Wave to pass through in bulk.

- **WHAT IS THE BEST-SHOT AT MAXIMUM RANGE?** As long as the spread of the probes is at least four inches, the ADVANCED TASER will be extremely effective. To ensure that the spread is greater than four inches, the ADVANCED TASER should be fired at a target several feet away. The optimum shot is from seven to ten feet away from the target to achieve maximum effect using a 15-foot cartridge and 12-18 for a 21-foot cartridge.

DOES TEMPERATURE HAVE A DETRIMENTAL EFFECT ON THE ADVANCED TASER? Yes. The weakness to the system is not the ADVANCED TASER. The batteries limit the effectiveness in cold and extremely hot temperatures. Alkaline batteries perform poorly at freezing temperatures. However, Nickel Metal Hydride (NiMH) rechargeable batteries can be substituted in a freezing climate, as their performances are better suited in colder climates. The heat issue is only an issue if the ADVANCED TASER were left sitting in the sun, once again

adversely affecting the batteries. As for the Air Cartridge, it utilizes compressed nitrogen (an inert gas). The ADVANCED TASER compressed air capsules have successfully held their charges at temperatures of minus 20° F and up to 160° F. Moreover, altitude will not adversely effect the firing of an ADVANCED TASER. In addition, the temperature will not effect the T-Wave. However, as with any product containing polycarbonates and other thermoplastics, the ADVANCED TASER and Air Cartridges should never be left in direct sunlight.

SUMMARY POINTS:

- Truly incapacitating: This less-lethal system is solely designed to stop the most hardened of targets: extremely violent, aggressive, goal-oriented and drug induced suspects.
- It can't kill or maim innocent bystanders, damage buildings or aircraft fuselages with stray bullets.
- Won't damage buildings or aircraft: It is a defensive device and can't penetrate walls, doors or glass.
- It is far more effective than other less-lethal self-defense devices, such as pepper sprays or beanbag weapons -- no cross-contamination or blunt instrument damage inflicted.
- It uses the same muscle memory as that of a firearm for police under stress. The ADVANCED TASER records the last 585 firings to protect law enforcement from false allegations of misuse.
- Training is simple and the learning curve is relatively flat – critical in training multiple users
- The ADVANCED TASER is 26 Watts. Its amperage is 0.162 – not enough to cause damage to the human body. It is 50,000 Volts.
- Effective against most conventional body armor and other counter-measures.

- The stun gun backup does not make this a one-shot only device.
- Lifetime Warranty.
- It will not cause a heart attack or damage a pacemaker; will not cause electrocution, even if target is standing in water.
- It will not cause urination or defecation.