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THE NATIONAL TRANSPORTATION SAFETY BOARD'S MOST WANTED AVIATION SAFETY IMPROVEMENTS

(110–47)

HEARING

BEFORE THE

SUBCOMMITTEE ON AVIATION

OF THE

COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

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CONTENTS

Page

Summary of Subject Matter vi

TESTIMONY

Coyne, James K., President, National Air Transportation Association 33
Dunham, Gail, President, National Air Disaster Alliance/Foundation 33
Friend, Patricia, International President, Association of Flight Attendants 33
Gilligan, Margaret, Associate Administrator for Aviation Safety, Federal Aviation Administration, accompanied by John Hickey, Director of Aircraft Certification Services, Federal Aviation Administration 5
Prater, Captain John, President, Air Line Pilots Association International 33
Rosenker, Hon. Mark V., Chairman, National Transportation Safety Board, accompanied by Tom Haueter, Director of Aviation Safety, National Transportation Safety Board 5
Voss, William R., President and CEO, Flight Safety Foundation 33

PREPARED STATEMENTS SUBMITTED BY MEMBERS OF CONGRESS

Costello, Hon. Jerry F., of Illinois 53
Hirono, Hon. Mazie K., of Hawaii 59
Mitchell, Hon. Harry E., of Arizona 61
Oberstar, Hon. James L., of Minnesota 65
Salazar, Hon. John T., of Colorado 67

PREPARED STATEMENTS SUBMITTED BY WITNESSES

Coyne, James K. 69
Dunham, Gail 77
Friend, Patricia A. 88
Gilligan, Margaret 98
Prater, Captain John 128
Rosenker, Mark V. 140
Voss, William R. 160

SUBMISSION FOR THE RECORD

Dunham, Gail, President, National Air Disaster Alliance/Foundation, response to question from the Subcommittee 85
Gilligan, Margaret, Associate Administrator for Aviation Safety, Federal Aviation Administration, accompanied by John Hickey, Director of Aircraft Certification Services, Federal Aviation Administration:
Response to questions from Rep. Moran 114
Response to questions from the Subcommittee 116
Rosenker, Hon. Mark V., Chairman, National Transportation Safety Board, accompanied by Tom Haueter, Director of Aviation Safety, National Transportation Safety Board, response to questions from Rep. Chandler 155

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June 4, 2007

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SUMMARY OF SUBJECT MATTER

TO: Members of the Subcommittee on Aviation

FROM: Subcommittee on Aviation Staff

SUBJECT: The National Transportation Safety Board's Most Wanted Aviation Safety Improvements

PURPOSE OF HEARING

The Subcommittee will meet on Wednesday, June 6 at 10:00 a.m. in Room 2167 Rayburn House Office Building to receive testimony regarding the National Transportation Safety Board's Most Wanted Aviation Safety Improvements.

BACKGROUND

Since 1990, the National Transportation Safety Board (NTSB) has issued a list of its Most Wanted Safety Improvements to focus attention on safety issues the NTSB believes will have the greatest impact on transportation safety. For 2007, the NTSB has identified the following issues as its Most Wanted for aviation: aircraft icing; fuel tank flammability; runway incursions; improved audio and data recorders; fatigue; and part 135[1] crew resource management.

I. NTSB Most Wanted Aviation Improvements

A. Aircraft Icing

The NTSB's recommendation on aircraft icing stems from the 1994 crash of a commuter airliner in Roselawn, Indiana, in which there were 68 fatalities. According to the NTSB, the Roselawn crash was caused by in-flight icing conditions and subsequent loss of control of the

[1] Part 135 of the FAA's regulations govern the operating requirements for air carriers providing scheduled service in aircraft with less than 10 seats, as well as on-demand or air taxi service. In addition to rules in Part 91, air carriers have to comply with Part 135 requirements to meet their responsibility to provide air transportation at the highest level of safety practicable.

aircraft. The Roselawn crash prompted the NTSB to examine the issue of airframe structural icing. The NTSB concluded that Federal Aviation Administration (FAA) icing certification process for aircraft has been inadequate because the process has not required manufacturers to demonstrate an airplane's flight handling capabilities under a realistic range of adverse ice conditions. In addition, the NTSB determined, after the 1997 crash of Comair flight 3272 in Monroe, Michigan, which was also caused by in-flight icing, that the FAA should perform additional research into the effects of in-flight icing, and apply revised icing requirements to currently certificated aircraft.

The NTSB recommended that the FAA revise the: (1) icing criteria and icing testing requirements necessary for an airplane design to be approved for in-flight icing conditions within the United States; and (2) operational means and limitations to determine icing conditions in which it is permissible to operate an approved aircraft. The NTSB states that FAA referred this work to an Aviation Rulemaking Advisory Committee (ARAC)[2] 10 years ago. The ARAC recommended to the FAA changes to the design requirements for new airplanes to evaluate performance and handling characteristics in icing conditions. The NTSB notes that the FAA currently has rulemaking activities geared towards improving icing design standards. However, the NTSB is concerned that because these rulemakings are in the preliminary stages, implementation of them may be years away, and will only apply to newly certificated aircraft. Accordingly, the NTSB still has icing on its Most Wanted list because the FAA has not yet adopted a systematic and proactive approach to the certification and operational issues of airplane icing.

NTSB Recommendation: Complete research on aircraft structural icing and continue efforts to revise icing certification criteria, testing requirements, and restrictions on operations in icing conditions. Evaluate all aircraft certified for flight in icing conditions using the new criteria and standards.

FAA Response:

According to the FAA, in December 2005, the ARAC completed its final report on supercooled large droplet[3] (SLD) icing conditions and ice crystal/mixed phase conditions. The report included recommendations to have the FAA define a SLD environment and to address ice crystal/mixed phase conditions as well as aircraft performance and handling qualities, engine installation effects, ice protection system requirements, as well as engine requirements. ARAC approved the report and sent it to the FAA in March 2006. The FAA is currently performing an economic analysis of the ARAC's proposal.

In addition, the FAA states that it has: investigated all airplanes used in regularly scheduled passenger service that are equipped with pneumatic deicing boots[4] and unpowered ailerons[5] to determine flight characteristics in icing conditions; issued over 40 airworthiness directives for airplanes equipped with pneumatic deicing boots and unpowered ailerons; and issued a

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[2] The Aviation Rulemaking Advisory Committee was established in 1989 to allow the FAA to consult with interested parties on rulemakings.

[3] Supercooled large droplets are typically found in freezing drizzle and rain where water droplets stay in liquid form even though the water temperature of the droplets is below freezing. In general, droplets greater than about one fourth the thickness of human hair are considered SLDs.

[4] Pneumatic deicing boots are elastic membranes on the leading edge of airfoils, which can be inflated using pressurized air. When they are inflated, ice which has accumulated on the boot is fractured and carried away by the airflow.

[5] Unpowered ailerons are flight control surfaces used for roll control that are moved by the pilot without powered assistance from hydraulic or electrical actuators.

memorandum to all FAA Aircraft Certification Offices to require an evaluation of newly designed or derivative aircraft with unpowered ailerons and pneumatic deicing boots. The FAA states that it initiated rulemaking projects to amend the part 25[6] rules to require a reliable means for flight crews to know when they are in icing conditions and to improve airplane performance and handling qualities in icing conditions; as well as a rulemaking project to amend the part 121[7] operating rules to set forth more restrictive requirements for when flight crews must activate the ice protection systems and/or exit icing conditions.

NTSB Classification: The NTSB classifies the FAA's response as unacceptable because more than 10 years after the Safety Board issued these recommendations, the FAA has yet to issue any of the operational, design, or testing requirement revisions recommended.

B. Fuel Tank Flammability

The elimination of flammable, fuel/air vapors in fuel tanks on transport category aircraft has been on the NTSB's Most Wanted list since the 1996 crash of TWA 800, in which there were 230 fatalities. The NTSB determined the probable cause of the TWA 800 crash as a fuel explosion in the center-wing fuel tank, resulting from the ignition of the flammable fuel/air mixture in the tank. According to the NTSB, operating transport-category airplanes with flammable fuel/air vapors in fuel tanks presents a risk of explosion that is avoidable. The NTSB states that center wing fuel tank explosions have resulted in 346 fatalities in four accidents since 1989. In addition, there also have been several non-fatal fuel tank explosions, the latest of which occurred in India in May 2006. After the TWA 800 accident in 1996, the Board issued both short and long term recommendations to reduce the potential for flammable fuel/air mixtures in all transport category aircraft fuel tanks. The FAA has committed to action on the long term recommendation by fall 2007.

NTSB Recommendation: Complete rulemaking efforts to preclude the operation of transport-category airplanes with flammable fuel/air mixtures in the fuel tank on all transport category aircraft.

FAA Response:

The FAA states that since the TWA 800 crash, it has issued over 100 airworthiness directives and a special federal regulation to eliminate ignition sources. In addition, in May 2002, the FAA developed a prototype on-board inerting system that replaces oxygen in the fuel tank with inert gas, which prevents the potential ignition of flammable vapors. This system can significantly reduce the flammability exposure of high-risk fuel tanks. The FAA believes that inerting-based flammability reduction means, together with additional ignition prevention measures required, provide a balanced approach to fuel tank safety that will greatly reduce the risk of fuel tank explosions.

On November 23, 2005, FAA published a notice of proposed rulemaking (NPRM) that would require aircraft operators to reduce the flammability levels of fuel tank vapors to remove the likelihood of a potential explosion from an ignition source. The NPRM does not direct the

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[6] Part 25 of the FAA's regulations govern the design and airworthiness standards for transport category aircraft. These include all aircraft operated by major airlines, as well as most business jet aircraft.

[7] Part 121 of the FAA's regulations govern the operating requirements for air carriers —airlines operating scheduled service in aircraft with 10 seats or more. In addition to rules in Part 91, air carriers have to comply with these requirements to meet their responsibility to provide air transportation at the highest level of safety practicable.

adoption of a specific inerting technology; but rather, sets performance goals for acceptable levels of flammability exposure in tanks most prone to explosion or requires the installation of an ignition mitigation means in the tank. The FAA's proposal applies to new large airplane designs, and also requires the retrofitting of several airplane types including the Boeing 737, 747, 757, 767, and 777 as well as Airbus A320 and A330 models flown by U.S. operators. The comment period closed on May 8, 2006, and the FAA plans to issue the final rule by the end of 2007.

NTSB Classification: The NTSB classifies FAA's response, as set forth above, as acceptable (progressing slowly).

C. Runway Incursions

Since 1990, the prevention of runway incursions has been on the NTSB's Most Wanted list. A runway incursion is any instance on a runway involving an aircraft, vehicle, person, or object that creates a collision hazard or results in loss of required separation with an aircraft preparing to take off or land.

The deadliest runway incursion occurred in March 1977, when two passenger jumbo jets collided on a runway at Tenerife, Canary Islands, causing the deaths of 583 passengers and crew. The accident holds the record for the greatest loss of life for any single airplane accident. In the U.S., the deadliest runway incursion occurred in 1991 when a USAir 737 and a Skywest Metroliner commuter airplane collided at Los Angeles International Airport, resulting in 34 fatalities.

According to the Department of Transportation Inspector General (DOT IG), the total number of runway incursions in the United States decreased from a high of 407 in FY 2001 to 330 in 2006, and the most serious incidents have decreased from a high of 69 in FY 1991 to 31 in 2006. However, the DOT IG notes that since 2003, the number of runway incursions has leveled off, but serious incursions continue to occur.[8] Recent serious runway incursions have occurred at Chicago O'Hare and Denver International Airport. According to the NTSB, in July 2006, a United 737 passenger jet and an Atlas Air 747 cargo airplane avoided collision by about 35 feet at O'Hare airport. In addition, the NTSB states that on January 5, 2007, a Key Lime Air and a Frontier Flight avoided collision by about 50 feet at Denver International Airport.

The NTSB states that to further prevent runway incursions, information needs to be provided directly to the flight crews as expeditiously as possible. According to the NTSB, in an effort to improve runway safety, the FAA has taken action to inform controllers of potential runway incursions, improve airport markings, and install the Airport Movement Area Safety System (AMASS) and Airport Surface Detection Equipment Model X (ASDE-X). AMASS tracks ground movements and provides an alert to controllers if evasive action is required. The ASDE-X radar integrates data from a variety of sources, including radars and aircraft transponders, to give controllers a more reliable view of airport operations.

However, the NTSB states that these systems are not sufficient as designed to prevent all runway incursions because the information must be routed through air traffic control before it is relayed to the pilots on the ground. For example, the NTSB notes that after an AMASS alert, the controller must determine the nature of the problem, determine the location, identify the aircraft

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[8] *See* DOT IG March 6, 2007 testimony before the Committee on Appropriations, Subcommittee on Transportation, Housing and Urban Development, *Top Management Challenges Facing the Department of Transportation*, at p. 8-9.

involved, and determine what action to take. Only after all of these determinations have been made can appropriate warnings or instructions be issued. The flight crew must then respond to the situation and take action.

NTSB Recommendation: Implement a safety system for ground movement that will ensure the safe movement of airplanes on the ground and provide direct warning capability to the flight crews.

FAA Response:

According to the FAA, in fiscal year 2005, a study was conducted by MITRE/CAASD[9] to determine if a direct warning capability to flight crews could be developed by implementing a set of technologies that would create a layered safety net for the prevention of runway incursions. The MITRE/CAASD ground-based direct warning system simulation report was completed in November 2006, and the system architecture document for a ground-based Direct Pilot Warning System was completed in January 2007.

The FAA is also testing new technologies that will alert pilots when it is unsafe to enter, land or take off on a runway. One of these technologies is called the Runway Status Lights System (RWSL). RWSL uses inputs from surface and terminal surveillance systems and illuminates red in-pavement lights to signal when it is unsafe to enter, cross or take-off on a runway. Runway entrance lights (REL) are illuminated if the runway is unsafe for entry or crossing, and takeoff hold lights (THL) are illuminated if the runway is unsafe for departure. The initial operational evaluation of the runway entrance lights using ASDE-X surface surveillance was completed in June 2005 at Dallas/Ft. Worth International Airport. According to the FAA, the system showed promising results: the lights were compatible with the tempo and style of operations at a busy airport, there was no increase in air traffic controller workload, and the lights proved useful to pilots. The RWSL operational evaluation system will be extended to other runways at Dallas/Ft. Worth this year. The evaluation of Runway Status Lights with AMASS began December 2006 at San Diego Lindbergh Field. The RWSL is in the investment analysis phase of the FAA approval process for system acquisition.

Other new technologies being tested by the FAA include an experimental system called the Final Approach Runway Occupancy Signal (FAROS), which is being tested at the Long Beach/Daugherty Field Airport in California. FAROS is designed to prevent accidents on airport runways by activating a flashing light visible to landing pilots to warn them that the runway is occupied. An enhanced variant of the FAROS system (Active FAROS) is being developed for use at high-density airports.

NTSB Classification: The NTSB classifies FAA's response, as set forth above, as unacceptable because although the Board has been encouraged by some progress related to evaluating technologies, it has been 7 years since this recommendation was issued and it has been only in the past 2 years that the FAA has started evaluating technologies that are responsive to the recommendation.

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[9] MITRE is a non-profit organization and the Center for Advanced Aviation System Development (CAASD) was established in 1990 within MITRE. MITRE-CAASD is sponsored by the FAA as a Federally Funded Research and Development Center (FFRDC). An FFRDC meets certain special long-term research or development needs that cannot be met as effectively by existing in-house or contractor resources.

D. Audio, Data and Video Recorders

The NTSB has made eight separate recommendations regarding audio, data, and video recorders since adding this issue to its Most Wanted list in 1999. The NTSB states that enhancing audio, data, and video recorders on aircraft would help its investigators determine the factors related to an aircraft accident. According to the NTSB, automatic information recording devices, such as cockpit voice recorders (CVRs) and flight data recorders (FDRs), have proven to be excellent tools in gathering post-accident factual information, which is recorded immediately before and during the accident sequence, enabling investigators to quickly discover problems and make recommendations to correct them.

To enhance the quality of information recorded by CVRs, the NTSB recommended that, for airplanes required to carry both a CVR and FDR, FAA requires a retrofitted CVR that records a minimum of 2 hours of audio information and that uses an independent power source that provides 10 minutes of operation if normal power ceases.

In addition, the NTSB has analyzed multiple airplane crashes where the FDRs were either destroyed or contained inadequate data because the airplane's main power source shut down, inhibiting post-accident investigations. Accordingly, the NTSB has recommended that aircraft carry two combination CVR/FDR systems. Currently, most large airplanes in commercial service are required to have one CVR and one FDR on board. The NTSB states that if two combination systems are installed, one system should be as close to the cockpit as possible, and the other, as far away as possible. The NTSB recommends that both combination recorders meet the current FDR requirements to store 25 hours of flight data, and the proposed/recommended 2-hour duration for all cockpit audio and pilot-controller datalink messages.

The NTSB has also made several recommendations to increase the number of digital flight data recorder (DFDR) parameters for all Boeing 737 series airplanes, especially for the rudder system. As for cockpit video recorders, the NTSB believes that installation of such devices on smaller aircraft would provide investigators with critical flight information for airplanes that are not required to have FDRs or CVRs. Moreover, in large aircraft, the NTSB believes that video recorders would provide operational information not otherwise provided by FDRs and CVRs. Note that privacy concerns have been raised about the possible post-accident release of cockpit video data or images, especially when accidents occur outside of the U.S.

NTSB Recommendation: In addition to adopting a 2-hour CVR requirement, the NTSB recommends requiring the retrofit of existing CVRs with an independent power supply, and requiring that existing FDRs and CVRs be on separate generator busses, with the highest reliable power so that any single electrical failure does not disable both. Require the installation of video recording systems in small and large aircraft. Require the recording of additional needed FDR data for Boeing 737s.

FAA Response:

The FAA has proposed two separate rules that it believes would address many of the issues raised by the NTSB. The first proposal, which was issued on February 28, 2005, would make improvements to CVR and DFDR systems to: increase the recording time of certain CVRs; install a power supply that provides 10 minutes of back-up power to the CVR; increase the data recording

rate for certain DFDR parameters; require that DFDRs and CVRs be in separate containers; require that both the CVR and DFDR be powered by separate, highly reliable electrical busses; and require that certain datalink communications received be recorded, if datalink communication equipment is installed. The FAA anticipates finalizing this proposal in July 2007.

In addition, on September 5, 2006, the FAA issued a supplemental notice of proposed rulemaking (SNPRM) to revise a previously published proposal to increase the number of DFDR parameters required for all Boeing 737 series airplanes, including the addition of sensor equipment to monitor the rudder system on 737s. Since that time, the FAA has mandated significant changes to the rudder system on these airplanes. Accordingly, the SNPRM seeks more current information to determine the need for flight recorder parameters that monitor the new 737 rudder systems. The comment period for the SNPRM closed December 4, 2006, and the FAA expects to finalize its original proposed rule, with updated information from the SNPRM, later this year.

With regard to cockpit imaging recorders, the FAA states that it has explored the NTSB recommendations in a government/industry forum of subject matter experts, RTCA Future Flight Data Collection Committee (FFDCC), which was tasked with identifying flight data needs ten to fifteen years in the future. The FAA states that the information presented by the FFDCC did not persuade it of the necessity of installing image recording systems in transport-category aircraft. The FFDCC did mention, in the report, recommendations to resolve issues of security, privacy and confidentiality with regard to any mandate of image recorders. Although not planning to pursue rulemaking to mandate installations of cockpit image systems, the FAA states that if the NTSB requires additional flight data information to investigate an accident or incident, the FAA would likely propose a performance-based requirement that stipulates that this flight data must be captured.

NTSB Classification: The NTSB classifies FAA's response, set forth above, as unacceptable because it has been more than 10 years and the FAA is still only at the NPRM stage. The FAA is responsive to the 2-hour CVR and separate generator busses for CVRs and FDRs, but only for new airplanes. There is no rulemaking underway for cockpit image systems and the NPRM for duel combination units states "the FAA is unable to justify the excessive cost that would be incurred in the installation of two complete systems." Although the FAA's recent proposal seeks changes to the parameters required to be recorded for Boeing 737 aircraft, the Board is concerned that the proposed changes will not allow investigators to differentiate crew actions from anomalies in the rudder control system.

E. Fatigue

The NTSB has included operator fatigue on its Most Wanted list since 1990. Since 1972, the NTSB has issued more than ten aviation fatigue recommendations. There are currently four open aviation recommendations concerning flight crew and maintenance technician fatigue.

For flight crews, the NTSB is particularly concerned about tail-end ferry flights. These are flights that are conducted by part 121 or part 135 carriers, such as repositioning flights, but are flown under part 91[10] rules. Flying under part 91 rules allows pilots to continue to accumulate flight hours even if they have exceeded their duty time limits under part 121 or part 135. The NTSB

[10] Part 91 of the FAA's rules govern the operating and flight rules for everyone operating in the National Airspace System.

would like the FAA to require that hours flown in company non-revenue flights be included in a crewmembers' total flight time accrued in revenue operations. In addition, the NTSB has recommended that FAA revise current flight and duty limitations to take into consideration the latest research findings in fatigue and sleep issues, as well as length of duty day, starting time, workload, and other factors.

For aviation maintenance personnel, the NTSB has recommended that the FAA study the issue and then establish duty time limitations consistent with current state of scientific knowledge for personnel who perform maintenance on air carrier aircraft.

More recently, on April 10, 2007, the NTSB issued two recommendations to the FAA to work with the controllers union to revise controller work-scheduling policies to provide for adequate rest periods, and to develop fatigue awareness and countermeasures training program for controllers and controller-schedulers. These recommendations are not currently on the NTSB Most Wanted list.

NTSB Recommendation: The FAA should set working hour limits for flight crews and aviation mechanics based on fatigue research, circadian rhythms, and sleep and rest requirements. The FAA should also ensure that all company flying conducted after revenue operations-such as training and check flights, ferry flights and repositioning flights-be included in the crewmember's total flight time accrued during revenue operations.

FAA Response:

In 1995, the FAA proposed to amend existing regulations to establish new duty period and flight time limitations, and rest requirements for flight crewmembers in parts 121 and 135. This rulemaking was based on recommendations from an ARAC. It included a 14-hour duty period, 10 hours of rest, increased flight time to 10 hours, and addressed other related issues. According to the FAA, the pilots felt 10 hours of flight time was too long and the operators felt 14 hours of duty time was too short. To date, the regulations have not been revised. However, in 2000, FAA issued an interpretation of the flight and rest rules for domestic operations, which clarified that a flight cannot be started if the pilot has not had a minimum of eight hours of rest in the 24 hours preceding the end of the flight.[11]

In 2004, the FAA established a joint FAA/Industry Aviation Rulemaking Committee (ARC) to develop recommendations for revising the commuter and on-demand flight time and rest requirement rules in 14 CFR part 135. The ARC recommended revised language for part 135 operators to permit three options to ensure that crewmembers are provided adequate opportunities for sleep including rules that: are similar to the current rules, but which are more restrictive in nature, recognize the latest fatigue science, and close current regulatory "loopholes;" permit the certificate holder to vary when a duty assignment may be made, but ensures that crewmembers are given an opportunity for sleep at the same time every day; and would allow a certificate holder to

[11] The FAA notes that it is also working with the International Civil Aviation Organization (ICAO) to develop a Fatigue Risk Management System (FRMS) to regulate flight and duty time. A FRMS would provide an alternative to existing flight and duty limitations, and would move towards a risk based approach to improve flight crew alertness. The FRMS would require the company to manage fatigue with input from all company personnel, including management, flight crewmembers, maintenance personnel, schedulers, and dispatchers.

develop and implement an "Alertness Management Program" in lieu of current requirements. The FAA is presently developing an NPRM that incorporates the ARC's recommendations.

As to personnel fatigue in aviation maintenance, the FAA issued a report in 1999 entitled *Study of Fatigue Factors Affecting Human Performance in Aviation Maintenance*, in April 2000 completed an expanded study and issued a report entitled *Evaluation of Aviation Maintenance Working Environments, Fatigue, and Maintenance Errors/Accidents* and in January 2001 issued a report entitled *Evaluation of Aviation Working Environments, Fatigue, and Human Performance.*

The FAA's initial findings suggest that fatigue is an issue in this work force. Data from "mini-logger monitors" that recorded data from the selected parameters of light, noise levels, and temperature; activity monitors that monitored physical activity, sleep, and sleep quality; and the answers to background questions that employees were asked clearly indicate that sleep durations are inadequate to prevent fatigue. For most aviation maintenance technician specialties, 30-40 percent of respondents reported sleep durations of less than 6 hours, and 25 percent of respondents reported feeling fatigued or exhausted. While these studies did identify that mechanics generally did not have adequate rest, there was no attempt to correlate lack of rest to incidents and accidents.

The FAA has developed a manual entitled "Operator's Manual for Human Factors in Aviation Maintenance" that includes information on fatigue and fatigue management. Starting in 2007, the FAA states that it redesigned its Human Factors in Aviation Maintenance training program for all airworthiness safety inspectors that provides information on how to recognize fatigue issues while performing inspections and safety oversight of maintenance facilities.

The FAA studies indicate education and training in fatigue management are the most appropriate and direct actions for the FAA to address the fatigue issues. The FAA consequently has developed fatigue information materials and conducts education and training activities on fatigue management for aircraft maintenance personnel through symposiums, workshops, conferences, etc.

Currently, FAA is undertaking a rulemaking initiative to revise 14 CFR part 121 and 135 maintenance training requirements. This new rule will require part 121 and 135 maintenance training programs to include human factors training to be approved by the FAA.

The FAA plans to respond to the controller fatigue issues within 90 days of the NTSB's April 10th, 2007, recommendations.

NTSB Classification: The NTSB classifies FAA's response, set forth above, as unacceptable because the FAA has neither taken the recommended action nor have they indicated any firm plans to take the recommended actions.

F. Crew Resource Management (CRM) Training for Part 135 Flights

Part 121 and scheduled part 135 operators are required to provide pilots with CRM training in which accidents are reviewed and skills and techniques for effective crew coordination are presented. CRM training enhances pilots' performance in the cockpit by helping crew identify mistakes in judgment or action and to compensate for them to prevent accidents. The NTSB states that it has investigated several fatal aviation accidents involving part 135 on-demand operators (air taxis) where the carrier either did not have a CRM program, or the CRM program was much less comprehensive than would be required for a part 121 carrier. The NTSB states that CRM training

may have aided the crews involved in the accidents. According to the NTSB, the FAA has agreed in principal with this recommendation, but no progress has been made on the regulatory front.

NTSB Recommendation: Require that part 135 on-demand charter operators that conduct dual-pilot operations establish and implement an FAA-approved CRM training program for pilots in accordance with part 121.

FAA Response:

CRM training is currently required for part 121 operators as well as for fractional ownership operators. The FAA established an ARC in 2004 to revise and improve part 135 regulatory requirements, including requiring CRM training for part 135 operators of airplanes with two pilots. The ARC has provided its recommendations to the FAA, stating that the FAA should require all part 135 certificate holders (including both single pilot and dual pilot operations) to implement CRM training for crewmembers and flight followers/dispatchers.

The FAA is developing a proposed rule based on the ARC's recommendations. The FAA expects to publish the proposed rule in the summer of 2008. The FAA states that the proposed rule would codify current FAA guidance, respond to NTSB recommendations, as well as respond to the recommendations of the part 125/135 ARC that was established in April 2003.

NTSB Classification: The NTSB classifies FAA's response, set forth above, as unacceptable because an NRPM has yet to be issued and the Board is concerned that the CRM revisions will be part of a comprehensive revision to part 135 that will be slow moving.

WITNESSES

PANEL I:

Mr. Mark Rosenker
Chairman
National Transportation Safety Board

Ms. Margaret Gilligan
Associate Administrator for Aviation Safety
Federal Aviation Administration

PANEL II:

Ms. Gail Dunham
President
National Air Disaster Alliance Foundation

Mr. William R. Voss
President and CEO
Flight Safety Foundation

Captain John Prater
President
Air Line Pilots Association International

Ms. Patricia Friend
International President
Association of Flight Attendants

Mr. James K. Coyne
President
National Air Transportation Association

HEARING ON THE NATIONAL TRANSPORTATION SAFETY BOARD'S MOST WANTED AVIATION SAFETY IMPROVEMENTS

Wednesday, June 6, 2007

HOUSE OF REPRESENTATIVES,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
SUBCOMMITTEE ON AVIATION
Washington, DC.

The Subcommittee met, pursuant to call, at 10:00 a.m., in Room 2167, Rayburn House Office Building, the Honorable Jerry F. Costello [Chairman of the Subcommittee] presiding.

Mr. COSTELLO. The Subcommittee will come to order.

The Chair will ask all Members, staff and everyone in the hearing room to turn their electronic devices off or on vibrate.

The Subcommittee is meeting today to hear testimony on the National Transportation Safety Board's Most Wanted Aviation Safety Improvements. I will give an opening statement and then call on my colleague and the Ranking Member of the Subcommittee to give his opening statement or brief remarks.

I welcome everyone to today's hearing on the National Transportation Safety Board's Most Wanted Aviation Safety Improvements. I have said time and again that although the United States has the safest air transportation system in the world, we cannot rely on or be satisfied with our past success. We must continue to strive for greater success because one accident or one near accident is one too many.

The National Transportation Safety Board has been investigating accidents and proposing remedies to avoid them since it was founded in 1967. With an overall recommendation acceptance rate of approximately 82 percent by the FAA, important changes and procedures have been made to improve the safety of the traveling public.

Since 1990, the NTSB has kept a Most Wanted List representing the most serious problems facing the transportation industry. There continues to be significant challenges in aviation safety. The NTSB's Most Wanted List has six issue areas for aviation, five of which receive an unacceptable response. I am disappointed and concerned as many of these issues have been on the Most Wanted List for five, ten or even fifteen years.

For example, runway incursions has been on the Most Wanted List since the list started in 1990. While new technologies have come on line and are slowly being deployed at our airports, serious incursions continue to happen. In an incident as recently as January 5th, 2007, at Denver International Airport where the NTSB

states that two airplanes missed colliding by almost 50 feet remind us of the importance of runway safety.

Further, both the General Accounting Office and the Department of Transportation's Inspector General's Office have also highlighted runway incursions as a safety concern. Yet, this issue still remains on the Most Wanted List.

I am interested in hearing both from the NTSB and the FAA why these six issue areas remain on the Most Wanted List, what, if any, progress is being made and when we can expect to see significant improvements in these issue areas.

I am also interested in hearing more about fatigue. Fatigue is an issue that affects all modes of transportation. Aviation is a 24 hour, seven day a week business with demanding work schedules. We must do more to ensure that all aviation safety professionals are rested and are alert to perform their duties.

Finally, I would like to point out that Gail Dunham, Executive Director of the National Disaster Alliance/Foundation is with us today. She represents family members that have lost loved ones in aviation accidents. Gail and her group know firsthand the pain that results when our aviation system is not performing at its highest level of safety possible. She reminds us all that we must demand the highest standards of aviation safety.

We must work together to ensure that we continue asking the tough questions and issue the even tougher and sometimes costly rules to guarantee the highest level of safety for the traveling public.

With that, I again want to welcome all of our witnesses and everyone here today, and I look forward to hearing the testimony of our witnesses.

Before I recognize the Ranking Member, Mr. Petri, for his opening statement or comments, I would ask unanimous consent to allow two weeks for all Members to revise and extend their remarks and to permit the submission of additional statements and materials by Members and witnesses.

Without objection, so ordered.

At this time, the Chair recognizes the Ranking Member, Mr. Petri, for his opening statement.

Mr. PETRI. Thank you, Mr. Chairman.

Our aviation system is the largest and safest in the world. Commercial aviation is also seeing the highest safety record in its over 100 years of existence. This remarkable record is the result of hard work by the safety officials at the FAA in cooperation with the National Transportation Safety Board and, of course, of the aviation community.

According to the FAA during 2004 to 2006, the average passenger death rate has fallen by some 90 percent from the average rate just 10 years. While no loss is acceptable, this remarkable improvement in passenger safety should be remarked upon. Certainly, to remain the leader of aviation safety worldwide and protect the lives of those who travel by air, we need to remain ever vigilant in our efforts to mitigate ongoing and emerging safety hazards.

Each year since 1990, the National Transportation Safety Board has issued an annual list of its most wanted safety improvements

to draw attention to safety issues that the Board believes will have the greatest impact on transportation safety. Through the Most Wanted List, the Board identifies its most important safety hazards, makes recommendations for FAA action and tracks progress of the FAA's efforts to mitigate the identified risks.

It should be noted that the safety issues included on the Most Wanted List tend to be the most complex, controversial and indeed costly to address. Additionally, many of the Board's recommendations require the development of new technologies or operational solutions to safety issues. That is why some of the recommendations remain on the list for many years.

Since the Most Wanted List began 17 years ago, the Board has closed 58 aviation safety recommendations. Of those, 44 recommendations or 75 percent have been closed with an acceptable rating by the National Transportation Safety Board, and 7 of those were actually classified as closed, exceeds recommended action. Some Most Wanted List recommendations are rated unacceptable and have remained on the list for several years or more.

While the Board agrees that great progress has been made in many of these aviation safety hazard areas, it does not believe that the safety issues have been completely resolved. The best examples of this are runway incursions and aircraft icing issues. So I look forward to hearing from the FAA on their progress on these two important safety issues.

While it is understandable that complex problems take time to solve, their potential to result in large scale catastrophic accidents means that they need to be urgently attended to.

I look forward to hearing about the FAA's progress on the other safety items on the National Transportation Safety Board's Most Wanted List, and I am also interested in hearing the views of our witnesses on the second panel regarding the processes at the FAA and the National Transportation Safety Board.

I thank the witnesses for appearing today and yield back the balance of my time.

Mr. COSTELLO. The Chair thanks the gentleman. The Chair now recognizes for an opening statement the former Chairman of this Subcommittee, Mr. Duncan from Tennessee.

Mr. DUNCAN. Well, thank you very much, Mr. Chairman.

The NTSB has made many good safety recommendations over the years and the FAA has, I think, done a good job of trying to balance the costs and the benefits but certainly always coming down on the side of safety where possible.

One of the NTSB's most wanted recommendations includes improvement of the audio and data recorders on commercial aircraft also known as the black boxes. The NTSB's recommendations include the requirement for the installation of a second set of recorder systems on the aircraft to achieve redundancy of what is arguably the most important tool used to understand the cause of aviation crash.

Several Members of this Committee and the House Homeland Security Committee and the authorizing committee and the Appropriations Committees have supported the implementation of this requirement with the inclusion of a deployable or ejectable flat

data and cockpit voice recorder system as the backup system to the currently required fixed recorders. This makes a lot of sense to me.

The deployable system records all required information but is designed to survive the crash differently than a fixed recorder. One of the deployable recorder's most significant benefits is its ability to separate from the aircraft at crash impact and float indefinitely on water while sending immediate notification to search and rescue crews of its and the aircraft's location. This is critically important in the aviation environment we live in today particularly for aircraft that are used in extended over-ocean operations.

I could go into this further, but I won't.

You mentioned, Mr. Chairman, Gail Dunham who is President o the National Air Disaster Alliance/Foundation. They have recommended this along with many other groups. I think this is something that we need to take a very close look at because this certainly could have helped in the TWA 800 crash and several other aviation accidents over the years.

So, with that, I will yield back the balance of my time.

Mr. COSTELLO. The Chair thanks the gentleman and now recognizes the gentlelady from California, Ms. Matsui.

Ms. MATSUI. Thank you, Mr. Chairman. Chairman Costello and Ranking Member Petri, thank you for calling this hearing today. I appreciate your skilled leadership during this FAA reauthorization process.

I would also like to thank our distinguished panel of speakers and witnesses. Your testimony will help inform our decisions as we address an issue of paramount importance to millions of American and international travelers.

So far on this Subcommittee, we have dealt with many important topics related to FAA reauthorization. We have examined aviation consumer issues and looked at Next Gen. We have delved into outsourcing and airport improvement financing. These are all integral parts of our Country's air transit system. However, none of these is as critical as safety. For that reason, this hearing today could probably be one of our most important of the year.

Mr. Chairman, I think most of us have felt the occasional pang of fear while flying. Whether during takeoff, landing, or during turbulence, flight can be frightening for many people. There is very little we can do about the human instinct that causes us to react this way. Fortunately, we can do a lot to ensure that this fear is unfounded. We do this by making our aviation system as safe as possible.

Some say that flying is already one of the safest ways to travel. This is true. It is more than 20 times safer to fly than to drive on our Nation's highways. Nonetheless, as we reauthorize the FAA, we can and should improve on its safety record.

As Members of Congress, we simply must be sure that American aviation is the safest, most secure in the world. Dealing with congestion is one way to do this. Upgrading our air traffic control infrastructure is another. The Subcommittee has already demonstrated a strong commitment to these goals. The best way to protect the flying public, however, is to follow the recommendations of those who know safety.

Mr. Chairman, the National Transportation Safety Board knows safety. The accomplished and professional people who work for the NTSB are experts on this subject. Fortunately, they have made it simple for the FAA and for us in Congress by issuing six proposals to increase aviation safety right now. These six recommendations are our road map to safer and more secure skies, but recommendations are empty unless they are followed. The NTSB's six safety proposals are no exception.

I am hopeful the FAA will re-dedicate itself to strengthening its safety policies. Only then will the American people fly the safest, most pleasant and most secure skies in the world.

Thank you again for your leadership, Mr. Chairman. I look forward to listening to today's testimony. I yield back the balance of my time.

Mr. COSTELLO. The Chair thanks the gentlelady and, at this time, welcomes our first panel.

Let me introduce our witnesses here today: the Honorable Mark Rosenker, the Chairman of the NTSB, and he is accompanied by Mr. Tom Haueter who is the Director of Aviation Safety with the NTSB; Margaret Gilligan who is the Associate Administrator for Aviation Safety with the FAA, and she is accompanied by John Hickey who is the Director of Aircraft Certification Services for the FAA.

Gentlemen and lady, we welcome you here today and look forward to your testimony.

The Chair now recognizes Chairman Rosenker.

TESTIMONY OF THE HONORABLE MARK V. ROSENKER, CHAIRMAN, NATIONAL TRANSPORTATION SAFETY BOARD ACCOMPANIED BY TOM HAUETER, DIRECTOR OF AVIATION SAFETY, NATIONAL TRANSPORTATION SAFETY BOARD; MARGARET GILLIGAN, ASSOCIATE ADMINISTRATOR FOR AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION, ACCOMPANIED BY JOHN HICKEY, DIRECTOR OF AIRCRAFT CERTIFICATION SERVICES, FEDERAL AVIATION ADMINISTRATION

Mr. ROSENKER. Good morning, Mr. Chairman, Ranking Member Petri and Members of the Subcommittee. Thank you for allowing me the opportunity to present testimony on behalf of the National Transportation Safety Board regarding the agency's Most Wanted List of Safety Improvements.

Our list of Most Wanted Safety Improvements was initiated in 1990 as an additional way for the Safety Board to focus attention on a group of safety recommendations selected for intensive follow-up.

The 2007 list includes six issue areas addressed to the FAA. The first issue asks the FAA to revise the way aircraft are designed and approved for flight into icing conditions. More than 10 years after the Safety Board issued these recommendations, the FAA has yet to issue any of the operational design or testing requirement revisions recommended.

The NPRMs issued in November of 2005 and April of 2007 reflect good progress but full implementation of the regulatory change

may still be several years away. The pace of the FAA's activities in response to these icing recommendations is unacceptably slow.

Issue area two asks the FAA to implement design changes to eliminate the generation of flammable fuel or air vapors in all transport category aircraft as a result of the in-flight breakup of TWA Flight 800. The FAA has developed a prototype inerting system to be retrofitted into existing airplanes at a fraction of the industry estimated cost. The system has been flight tested by the FAA, and the results indicate that the fuel tank inerting is both practical and effective.

An NPRM was published in the Federal Register in November of 2005 to require the installation of the flammability reduction system in commercial aircraft. The NPRM closed a year ago, and the FAA stated that a rule concerning flammability reduction would be issued this year.

The runway incursion issue has been on the Most Wanted List since its inception in 1990. The FAA has since informed controllers of potential runway incursions, improved airport markings and installed system known as AMASS and ASDE-X that alert controllers to potential incursions.

These systems are an improvement but are not sufficient to prevent all runway incursions because the information needs to be provided directly to the flight crews as expeditiously as possible. The issue is one of reaction time. Too much time is lost routing valuable information through air traffic control.

Until there is a system in place to positively control ground movements of all aircraft with direct warning to pilots, the potential for this type of disaster will continue to be high. It has been seven years since this recommendation was issued, yet it has only been in the past two years that the FAA has started evaluating technologies that are responsive to our thoughts.

The fourth issue area addresses the need for multiple specific improvements to CVRs and FDRs that are essential to accident investigation data collection and analysis. Although the FAA published an NPRM in 2005, it has been more than 10 years for some of the recommendations, and we are still only at the NPRM stage. Although some aspects of the proposed rulemaking are responsive to the Board's recommendations, the changes only apply to newly manufactured airplanes, not to both newly manufactured and existing aircraft as recommended.

In addition, while a recent FAA proposal seeks changes to the parameters required to be recorded for the Boeing 737, the proposed changes will not allow investigators to differentiate crew actions from anomalies in the rudder control system.

The Safety Board has also asked the FAA to require redundant CVR and FDR combined recording systems along with the installation of video recorders, but the FAA has taken no action.

Issue five asks the FAA to set working hour limits for flight crews and aviation mechanics based on fatigue research, circadian rhythms and sleep and rest requirements. The laws, rules and regulations governing this aspect of transportation safety date back to 1938 and 1958 respectively. They are not adequate to address today's problems.

Fatigue continues to be a significant aviation issue today, yet little or no regulatory action has been taken by the FAA, and they have not indicated any firm plans to take the recommended action.

The last issue on the list asks the FAA to require commuter and on-demand air taxi crews to receive the same level of CRM training as Part 121 carriers. This recommendation was issued as a result of the accident that took the life of Senator Paul Wellstone. To date, the NPRM has not been issued, and the Board is concerned that the CRM revisions will be delayed as part of a comprehensive revision to Part 135.

In closing, let me say the issues on our Most Wanted List tend to be those that are among the most complex and difficult to implement. While the FAA has made some progress, we are disappointed that there are so many recommendations on the list that have not been fully addressed.

I would be happy to answer any questions.

Mr. COSTELLO. The Chair thanks the gentleman and now recognizes Ms. Gilligan for her testimony.

Ms. GILLIGAN. Thank you, Mr. Chairman. Chairman Costello, Congressman Petri and Members of the Subcommittee, we are pleased to appear today to discuss aviation safety because the system has never been so safe and there is never a better time to focus on how we can continue to improve on our safety record.

Through its recommendations, the NTSB challenges all of us to consider every possible step we can possibly take to reduce accidents, but the truth is in the recent past we have suffered very few major accidents. That is why the FAA and the aviation industry working through the commercial aviation safety team have spent the last decade establishing safety requirements for things like new technology, training and standard operating procedures.

We have reduced the fatal accident rate significantly. The results speak for themselves. In the 1940s, we had about 1,300 fatalities for every 100 million passenger and crew who were on aircraft. By 1995, that number had dropped to about 47 fatalities. The average for the last three years has been about 4 fatalities per 100 million passenger and crew flying on aircraft.

That accident is not one of fate or luck but an achievement that is the result of hard work. In fact, like with medicine which addresses public health and safety, we have virtually eliminated some major causes of accidents. Just as dedicated physicians and researchers have eliminated smallpox and polio, this industry has virtually eliminated midair collisions, controlled flights into terrain and windshear accidents. I can assure you that those accident types will never return as the persistent recurring accident types they have been historically.

In those cases, we used a layered approach to address the safety risk. We trained flight crews on how to identify and manage risk, and we invented and implemented technology. Then we tested and provided oversight to make sure training and technology were properly implemented and properly performing.

With this history, I can assure you, the Members of this Committee, and the Chairman of the NTSB that we face the safety issues we are here to discuss with the same determination to find the right solutions.

Our work on fuel tanks is perhaps the poster child for FAA's persistence when faced with challenges. We have issued over 100 airworthiness directives requiring redesign and other corrective actions to eliminate ignition sources, but we knew we would never eliminate all potential ignition sources. When experts said we could not reduce the flammability level of fuel tanks, FAA began the hard work and research and we invented a method to do just that. We have proposed a rule requiring reduction of fuel tank flammability and will finalize that requirement this year.

On icing, you just need to watch your nightly weather report to know understanding and predicting weather is really tough, but we have issued 70 airworthiness directives for 50 different aircraft models requiring aircraft design changes and requiring pilots to exit severe icing conditions. These ADs address the operational concerns that the NTSB put forward in its recommendations.

We have developed new rules that will require designers to demonstrate how airplanes perform in icing conditions and that will assure that ice protection systems activate automatically based on moisture in the air and temperature.

And, yes, we are still working on some really complex icing-related problems, but I can tell you that just as we addressed controlled flight into terrain and other accident causes, we will address the risk posed by these phenomena.

Icing is another model of how we approached runway incursions as well. We have provided pilot training materials for general aviation and commercial pilots. We have mandated training for maintenance and airport personnel who operate on airports. We have begun the Runway Incursion Information Evaluation Program so we can collect information from those involved in errors and identify root causes.

We have developed and are implementing technology solutions that alert controllers to potential conflicts. We are approving onboard aircraft systems that let pilots see where their aircraft is in relation to the airport surface, and ultimately ADSB, a key technology of the system of the future, will provide pilots enhanced awareness in the airport operating environment.

Our scientific understanding of fatigue and its effects tell us fatigue is not easily addressed by prescriptive rules. Once again, we were faced with developing the solution. We started by working with NASA to develop fatigue mitigation measures, and this led to requirements for in-flight rest facilities for long haul flights as well as instructional materials for crew members.

And, we cannot overlook the importance of personal responsibility in the area of fatigue. Everyone involved in safety must take a personal commitment to report to work, rested and ready to perform their duties. No regulation can instill that sense of personal commitment.

We are ready, Mr. Chairman, to address any of the other particular concerns that the NTSB has on its list. I can tell you that we are committed as an industry to continue our improvement of our safety record. The accident rate serves as a barometer of whether we have made the right safety choices, and it is pointing in the right direction.

We will not rest on our laurels. We will address the NTSB recommendations.

I am prepared to answer any questions that the Committee may have.

Mr. COSTELLO. The Chair thanks the gentlelady.

Chairman Rosenker, let me ask you just a few questions.

One, I referenced in my opening statement the latest incident in January at the Denver International Airport. There seems to be a discrepancy between the NTSB's investigation and what the FAA reported, and specifically the NTSB indicated that Frontier Airline Flight A319, a passenger jet, and a Key Lime Air Fairchild Metroliner came within 50 feet of colliding. Is that correct?

Mr. ROSENKER. Yes, sir.

Mr. COSTELLO. The FAA reported that the distance was 145 feet. Can you explain that discrepancy? I will give Ms. Gilligan an opportunity to respond as well.

Mr. ROSENKER. Let me turn that one to Mr. Haueter. It is his investigators who do all the technical analysis to be able to answer that question.

Mr. COSTELLO. Mr. Haueter.

Mr. HAUETER. Yes, sir. Looking at the data, both radar data and flight data recorder information, we plotted it out and the closest distance between the aircraft was in the 50 foot range, yes.

Mr. COSTELLO. Ms. Gilligan, you have heard the testimony from the NTSB. Can you tell the Subcommittee why there is this discrepancy in reporting 145 feet versus 50 feet?

Ms. GILLIGAN. Yes, sir. There are some different technologies that are used to estimate that measure, and sometimes there are some discrepancies between the two.

I think more importantly both we and the NTSB identified this as a severe event, and we are focused on it from that perspective. We would consider the differences in measurements somewhat less relevant, given the fact that in either case it was an event that needs to be carefully analyzed and fully addressed.

Mr. COSTELLO. Mr. Rosenker, you indicate in your testimony that the AMASS system, the Airport Movement Area Safety System, is not adequate to prevent serious runway collisions, and you mention the ASDE-X but you do not describe in your testimony if you think the ASDE-X is effective.

I wonder if you might comment on both your feeling about the AMASS system and its inability to adequately avoid or prevent serious runway collisions, and then I would be interested in knowing how you feel about the ASDE-X.

Mr. ROSENKER. Yes, sir. Both of these technologies are clear improvements and have been tremendous assistance in the process of trying to reduce the number of runway incursions that occur. The problem, though, is when we have done some simulations, we have recognized that you can see an eight to eleven second, I would say gap between the time an air traffic controller is alerted to a potential runway incursion and the time that information is analyzed and communicated directly to the pilot so that he can or she can make a change.

What we believe the appropriate answer for the elimination of runway incursions would be direct communications in some way,

shape or form. Frankly, I must compliment and applaud the FAA for the work they have done here in the past two years. Things like runway status lights, the ferrous lights, these are direct communications to the cockpit.

We are hoping that, in fact, a decision will be made soon so that we can begin the process of eliminating these horrible potential catastrophic accidents.

Mr. COSTELLO. I will have a number of other questions concerning other issues on the list, but at this time I will recognize the Ranking Member, Mr. Petri, for questions.

Mr. PETRI. Thank you very much, Mr. Chairman.

I really wanted to start with sort of a more general question on the process involved in this. You compiled this list, I guess, for about 17 years. Partly, it is a public relations thing presumably to create a framework and draw people's attention to it.

But how do you go about using this tool, deciding what makes your 10 most wanted, I guess six of which are the subject of this hearing today, and what doesn't make that particular list?

Mr. ROSENKER. Mr. Petri, I thank you for that question.

I just so happened to have brought a copy of our Most Wanted List. I didn't bring enough for all of our guests and all of the Members. If I had a little more money in budget, I am sure I could provide that opportunity.

[Laughter.]

Mr. ROSENKER. But this has been a very, very effective device for the NTSB. Our business is not only to investigate the accident, find out what happened and make recommendations but to advocate for these recommendations because they do no good if, in fact, a recommendation is made and it sits on a piece of paper or on a shelf somewhere. Safety is only improved if, in fact, the recommendations are addressed by the modal administrations, and we have got a good record here.

The FAA has a good record. They would be getting what I would characterize as a B. About in the 40 years that we have been providing them recommendations, they have adopted about 82 percent of those. Now, of the 12,600 recommendations we have made, 3,700 have gone to the FAA. They are our largest, if you will, consumer of our recommendations. So they hear from us quite frequently. Again, I would like to see if I could get them to get a B plus, perhaps 85, 90 percent.

But this group of recommendations we put on our list every year. The Board meets in a Sunshine meeting to decide which of these critical issues are going to be put on our list. We give them a color code to be able to understand the status of these very important recommendations.

Sometimes we take them off because there have been acceptable responses by our modal administrators or because we are just not going to be able to get one through because they have said they are not going to do it. It is rare that they do it.

We are very pleased with the success rate of our Most Wanted List, and we will keep plugging on it. I can assure you, Mr. Petri. Thank you for that question.

Mr. PETRI. Is the list basically reflective of your experience in frequency of accidents or types of accidents or is it an occasion

there is some new technology and you say to yourself, well, if they would really deploy this, we could avoid a lot of accidents, so that gets up on the list and there are other things that, yes, they are a problem, but we can't imagine what they can actually do to deal with it, so it doesn't get on?

I am just kind of curious as to how you put this whole thing together.

Mr. ROSENKER. There is a combination of factors that go into it. Clearly, a high number of accidents would be something that would really generate significant interest from our staff and the Board members, but there are other what is genuinely doable to be able to do something to really impact a particular mode.

Clearly, one of our top ones, and I realize it is not under your jurisdiction in this Subcommittee, is positive train control. That is number one as it relates to our railroad mode, and we are pounding hard on that, and we are making progress.

As I say, we are very proud of what happens as a result of the advocacy work that comes from this list. So I know that the FAA continues to receive publicity about a number of these issues, and that puts them into perhaps a little more energetic mode as opposed to some that may not be quite as visible.

Mr. PETRI. Is there any one particular recommendation that you feel probably should be more vigorously addressed than it is currently being addressed?

Mr. ROSENKER. Mr. Petri, these recommendations are like our children. All of them are very, very important to us.

Mr. COSTELLO. I thank the Ranking Member.

Let me follow up on a question, Mr. Rosenker, to the Ranking Member's question. While we realize that all of the recommendations are like your children, how many of those recommendations have been on the Most Wanted List since it started in 1990?

We know that the runway incursion issue has been on the list since the very beginning of the list.

Mr. ROSENKER. Yes, sir. Of the aviation or the entire list?

Mr. COSTELLO. Aviation.

Mr. ROSENKER. Okay. That is a good question here. I never calculated it to that point. Fatigue and runway incursion.

Mr. COSTELLO. While you are looking, it would seem to me that if, in fact, the NTSB continues to put runway incursions and any other issue on their Most Wanted List since the beginning in 1990 that while all are equally important, it seems to me that if those issues haven't been addressed since 1990, that they continue to be important to the NTSB.

Mr. ROSENKER. Clearly, and in some cases as I think Mr. Petri pointed out, back in 1990 there may not have been the kinds of technologies that are clearly available today. Again, I indicated earlier that the FAA is doing an outstanding job of testing some direct communications to the cockpit. The question we have is: When will you finally implement that type of technology?

Mr. COSTELLO. Thank you.

The Chair now recognizes the gentlelady from California, Ms. Matsui.

Ms. MATSUI. Thank you, Mr. Chairman.

Mr. Rosenker, which of your six recommendations do you feel will be most quickly and easily completed?

I would expect that, Ms. Gilligan, you would comment on that too.

Mr. ROSENKER. I believe probably inerting of fuel tanks is probably the easiest one at this point. There are people that are doing it right now. The 787 has a system that is being designed into it which, in fact, would effectively inert the tank.

There are retrofit systems which, in fact, have been developed. Some models of the 74 are being delivered with systems which would, in fact, reduce the flammability. Some models of the 737 are also being delivered with these same systems. So I believe that is one which is just about ready.

I can't speak for the FAA, but I know. Frankly, I think I am sitting one person away from one of the great experts in that particular area, and I am sure he will be able to share information.

Another area that I believe we can be doing something quickly if a decision is made is that in the area of runway incursions. Again, I think the FAA has done a good job of experimenting with some very effective systems, and I look forward to hearing their comments on that.

Clearly, some issues as related to the improvement of the crew resource management in the 135 operations. They can do a relatively simple implementation, given they already have a good template in the 121 operations. So those are the ones that I believe could be easily accomplished.

I don't want to forget. I don't want to forget some technological capabilities that we would like to see, and that would be the video in the cockpits, both in small and large aircraft. We say small, meaning 121/135 type of operations.

We are also talking about the installation of dual—dual, that means one in the front, one in the back—combination units of both CVR and FDR. We believe that is quite feasible and could be implemented at any time.

So those are just a couple of examples of things that could pop right away if decisions are made.

Ms. MATSUI. Ms. Gilligan, would you comment?

Ms. GILLIGAN. Yes. Thank you, Congresswoman Matsui,

First, I want to make a clarification. I think it is important to remember that while some of these topics are on the Most Wanted List for a period of time, FAA and the industry have taken many, many steps to address them over that time.

For example, in icing, as I mentioned, we have issued a number of airworthiness directives that specifically addressed known risk both in terms of aircraft design and in terms of actions that pilot crews should take in response to severe icing. We are following that up then with additional work in terms of technology and some additional recommendations that the Board has made.

But, in fact, a number of recommendations in each of these categories have already been closed acceptable by the Board as we and the industry work our way through these complex issues.

Having said that, I think that we have a lot of work going on in all these areas. I agree with the Chairman that we are pushing hard on fuel tank flammability. As I mentioned in my opening

statement, first we had to invent that technology. Many of the Board's recommendations begin with the words, develop and implement. So the Board acknowledges that these are complex areas where fundamental research work often times needs to be done before we can actually address the risk in a comprehensive way.

But I think in all the areas we have activities underway that are addressing what the Board's intent was, and we continue to move forward on those.

Ms. MATSUI. I yield back.

Mr. COSTELLO. Thank you.

Let me follow up since you mentioned, Ms. Gilligan, about the fuel tank issue. I understand that the FAA has taken a layered approach, and I wonder if you might explain that for Members of the Subcommittee.

Ms. GILLIGAN. Certainly, Mr. Chairman, and I would ask Mr. Hickey to join in because he has done a lot of this work himself.

But as I mentioned, we started first with identifying potential ignition sources. That was always the original design intent, that we would eliminate ignition sources, but that work showed us, proved to us that we may never know all of the potential ignition sources. Because of that, we had to take this layered approach to also address fuel tank flammability.

John, if you would give some details on both the ignition source as well as the tank.

Mr. HICKEY. Mr. Chairman, the level of risk that existed prior to TWA 800 simply has been cut to a phenomenally low percentage. Through the actions of the airworthiness directives, over 100 of them, we have virtually eliminated all known potential ignition sources in the existing fleet today. Airplanes are being designed today with the knowledge of TWA 800, and all of that is sort of a point in the past.

The flammability reduction is an area that has been the most difficult, one of the most difficult technology issues we have had to deal with in any of the safety things, I think, we have been confronted with. The problem was it is not that a system can't exist. As many of you know, military and other sort of industries have those kinds of technologies, but to take a system like that and put it on a commercial airplane operating 10, 12, 14 hours a day is a very, very different scenario.

We chartered two groups of world class experts, not just FAA, not just industry. We had international experts with very world-renowned reputations on their own. They recommended to the FAA back in 2001 that the cost of such a system would be approximately $20 billion.

At that point, the FAA did not walk away from this issue, and we began to refute and challenge and demonstrate ourselves all the individual components that make up a flammability reduction system. We were successful at that a couple years later, and we are in the final process of finalizing that.

But I would like to echo my colleague, Mr. Rosenker, that we are not just waiting for this rule. We are already beginning to deliver airplanes with these systems. All airplanes coming out of Washington State from the Boeing Company are all wired and ready for these systems when the rule goes into place. Of course, we have

had conversations with the other manufacturers, and I think they are ready when the rule goes final as well.

So I think the safety level today of fuel tanks is considerably different than it was 10 years ago.

Mr. COSTELLO. Ms. Gilligan, when should we expect the rule to come forward from the FAA?

Ms. GILLIGAN. The Administrator has committed that we will complete this rule by the end of the year, and we are committed to that schedule.

Mr. COSTELLO. Thank you.

The Chair now recognizes Mr. Coble.

Mr. COBLE. Thank you, Mr. Chairman.

Chairman Rosenker, I am going to follow up. I think you responded either to the Chairman or the Ranking Member about the direct alerts to the pilot regarding runway incursion operations which are now under positive control by the air controllers.

If alerts are put directly into the cockpit, would that not invite a potential that the pilot may inadvertently turn into another hazard about which he is not familiar or am I being overly paranoid?

Mr. ROSENKER. Well, sir, I wouldn't call that paranoia. I think it is a good question.

Clearly, procedures are already in effect on what to do when you must go around. We saw that successfully occur in the first Denver accident. We believe that more information in the cockpit gives the pilots a better opportunity to make the right decisions.

Runway status lights are a clear—a clear—signal to a pilot, even though potentially a mistake may have been given to clear an active runway. All of the technology is telling those runway status lights that there is an occupied runway or about to be an occupied runway and that that pilot should stop his aircraft. You will see a light. It will stop you. It will tell you to stop.

You then may ask the question again to the air traffic controller: do you really want me to do this? At that point, the air traffic controller may say, no, I don't, thank you for that call.

So I think we will do more in these kinds of signals than we will have any problems.

That is a good question, sir. Thank you.

Mr. COBLE. That does not sound unreasonable to me.

Ms. Gilligan, how does the FAA involve the aviation community when responding to the NTSB's recommendations?

Ms. GILLIGAN. Congressman, generally, we outline to the Board how we intend to address their recommendation. Most often, that will require rulemaking or other kinds of agreements to be reached that involve the industry.

After we have outlined our approach, then we work closely with the industry through a number of either aviation rulemaking committees or other advisory groups in order to make sure that we have a common approach to the NTSB recommendations. We work very, very closely with industry and with our international partners to make sure we harmonize the actions that we take across the industry.

Mr. COBLE. Now, when I say aviation community, I am including commercial. I am including private, general aviation. Is that your read as well?

Ms. GILLIGAN. Yes, sir. Obviously, depending on what the recommendation is, sometimes it involves one community more than others, but we always involve both the general aviation and commercial industries as we go forward with rulemakings or policy changes as a result of NTSB recommendations.

Mr. COBLE. I thank you for that.

Let me ask you this, Ms. Gilligan. It has been in excess of a decade now since the TWO Flight 800 accident which crashed as a result of a fuel tank explosion, you will recall. What has been the progress of the development of fuel tank inerting systems and what is the deployment schedule of such systems?

Ms. GILLIGAN. Congressman, I think we have made outstanding progress. As Mr. Hickey described, first again, we had to invent the solution. This was not an off the shelf kind of a solution when the Board first recommended that we pursue this. In fact, it was FAA engineers and FAA scientists who developed the system that we believe can address fuel tank inerting.

We have proposed a rule to require the reduction of flammability in a fuel tank. You could use the inerting system. There may other technologies in the future. We wanted to leave the rule open to that. We will be going final with that rule this year, so we will mandate that kind of equipage within the fleet. We are making great progress.

Mr. COBLE. Anybody else want to weigh in on that?

Mr. HICKEY. Sir, the thing I would add is while that rule is working its way and there will be an implementation phase, I would like the Congressman to know that we are also taking measures in an interim period. We are working with the airlines to promote use of equipment at the gate area that would allow the carriers not to run the auxiliary power unit to keep the airplane cool for the passengers. It is that device which tends to heat the tanks up which creates the higher and more risky environment.

We are working with the airlines, and I think we have got very good success of many of the airlines today using those ground equipment to, as an interim measure, keep the risk at a lower level until we can get these systems out.

Mr. COBLE. I thank you for that. It is good to have you all with us.

Mr. Chairman, I yield back.

Mr. COSTELLO. The Chair thanks the gentleman and now recognizes the gentleman from Oregon, Mr. DeFazio.

Mr. DEFAZIO. Thank you, Mr. Chairman.

Ms. Gilligan, in your testimony you talked about the multi-pronged approach to icing issues, yet the NTSB classifies the FAA's response on icing as "unacceptable because more than 10 years after the Safety Board issued these recommendations, the FAA has yet to issue any of the operational design or testing requirement revisions recommended."

Would you please explain what the multi-pronged approach is that the NTSB finds unacceptable?

Ms. GILLIGAN. Yes, sir. We have taken a number of actions initially through airworthiness directives which, as you know, are a tool we can use to address a known safety concern. Using air-

worthiness directives, we issued design changes as well as training information to pilots.

Mr. DEFAZIO. You have issued design changes on aircraft for icing?

Ms. GILLIGAN. Yes, sir, through the airworthiness directives.

Mr. DEFAZIO. Future design?

Ms. GILLIGAN. No, sir. Airworthiness directives apply to the existing fleet, and I can have Mr. Hickey go through some of the specific airworthiness directives related to icing that we have issued if that would help.

Mr. DEFAZIO. That require design changes?

Mr. HICKEY. Yes, sir, a number of our airworthiness directives require the airplanes' operating speeds to be increased to give protection. We have required in some cases to have design changes to the stall warning systems. This is a warning system that tells the pilot he is going too slow. We have had some design modifications that add additional perhaps steps on the airplane to give the pilot better visual cue before he does a takeoff.

We have issued over 70 airworthiness directives that direct either a change to the airplane configuration whether it is to the design or the airplane's operating process or even for the pilot in the way he operates the airplane as if it was an operating rule.

If I may say, the difference is while we have addresses these 70 ADs, they are equivalent in my view to the NTSB's recommendation which would be done in a general rulemaking.

Mr. DEFAZIO. Mr. Rosenker, would you care to respond to that? They say they have taken care of the problem here.

Mr. ROSENKER. Well, they are taking care of part of the problem. We would agree with that. But I would like for the detail of this to my Director of Aviation Safety, Mr. Haueter.

Mr. DEFAZIO. Mr. Haueter?

Mr. HAUETER. Yes, we agree that they have been addressing the problem one airplane at a time as has been discovered through accidents and incidents. Our recommendation is more broader, to look at developing technologies for supercool liquid droplets, drops going on generically for the whole fleet for future designs. That is the basic difference.

Mr. DEFAZIO. You are saying we are back over here in the Tombstone mentality. When we lose a plane and we find out it was due to icing, then we deal with that type, that problem, and we are sort of dealing it with it that way.

But you are saying there may be an undiscovered problem. We are skating on this, not to make a bad pun, and you are worried that a more generic rule should be published and more done to prevent the next incident after which we would put out another design or operational change.

Mr. HAUETER. We would like to see a generic rule that addresses the whole fleet, both those currently in service and those in the future.

Mr. DEFAZIO. Okay. I sort of see a pattern here, and it is a concern I have had for a long time which is what constitutes a meaningful response by the FAA to NTSB recommendations? We have changed statute a bit to have the most wanted and that.

Mr. Rosenker, do you think we need to go further and maybe you should look at this in the FAA reauthorization, that somehow getting a more meaningful response than one that is sort of staged? You don't just sort of you make your recommendations, and then 10 years later you come forward and tell us what hasn't happened, but you actually have interim responses or progress reports or something. Could you address that?

Mr. ROSENKER. Yes, sir. Let me first say again the FAA and the NTSB are partners in trying to make sure that we make a safe industry even safer. They are getting about 82 percent of what we want. I am challenging my colleagues to go from 82 to 85 to 87 to 90 percent.

Mr. DEFAZIO. Right. What would get us there, I guess is the question.

Mr. ROSENKER. Yes, sir, exactly.

Mr. DEFAZIO. We know there is pressure from the industry saying oh, my God, no. That would cost money. We put in. We have to do these redundancies. We have to retrofit planes for recorder systems that don't have a separate bus and an electrical system for it. So, gee, you will have to wait until the next generation of planes 25 years from now to do that.

I mean those sorts of things.

Mr. ROSENKER. Many of these things are financial in nature. Others are a political will to do what we would characterize as the right thing in a timely manner.

But, again, I believe the people of the FAA are good, very committed people to safety. All I would like to see and my colleagues would like to see is a more timely response in many of these recommendations because many times we all get to the same place which is an ultimate implementation of the recommendation. Unfortunately, sometimes it is just what we believe takes too long.

Mr. DEFAZIO. Right. My time is expired, but I would just reflect back to the seat spacing requirement for over-wing exits which I started on and the NTSB started on after the Manchester incident, and I believe it was about seven years in the U.S. I took three months in Great Britain. It is my concern that we somehow be more responsive.

We did strip. After the ValuJet accident, I managed to strip out most of FAA's charge to promote the industry with the idea you would be a regulator and not a promoter. I think there is still some of that element, but I do grant that you are saying we are making progress.

Ms. Gilligan, you wanted to respond. I am sorry. I am just about out of time. I thought I saw you reaching for the button there.

Ms. GILLIGAN. I was ready in case you were asking me something.

[Laughter.]

Mr. DEFAZIO. No, no. What I want to do is I want to help the FAA to be more responsive and maybe slightly less responsive to concerns expressed by the industry in terms of: Gee, yes, it would be valuable to have that flight data recorder, but hey, we don't lose that many planes. And, gee, we are going to have to retrofit all these planes, and that will cost us much money, and maybe there will only be one or two planes that go down that we won't know

why they went down. And gee, we can just wait for the next generation.

I mean those kinds of things. We want to help you with those problems.

Ms. GILLIGAN. Yes, sir, I understand that, and I appreciate it. I also appreciate the Chairman's kind words about the FAA's commitment to safety.

Quite honestly, it is to the Board's credit that all major accidents have had a probable cause determination using the technologies that were available when those accidents occurred. So while we do agree there is room for improvement in recorder technology and we have proposed those improvements and we will again go final with those rules, the Board has been outstanding in being able to investigate the accidents with FAA and industry help so that we do understand what happened and we are able to correct those errors that we did not understand before.

I just want to reiterate that even while these recommendations may remain open for a period of time, FAA and industry are working throughout that time period, and we are doing things like enhanced training and providing pilots additional information on how to handle whether it is icing or other kinds of conditions. I think the Board would acknowledge it is not that we stand still for 10 years. We work through that time period and ultimately, if we are able, actually then invent the technology that takes us to that next step.

Mr. DEFAZIO. Thank you. Thank you, Mr. Chairman.

Mr. COSTELLO. The Chair thanks the gentleman from Oregon and recognizes the gentleman from Georgia, Mr. Westmoreland.

Mr. WESTMORELAND. I want to turn a little bit maybe to more of a civil aviation than the commercial aviation that the focus has been on here.

Ms. Gilligan, are you familiar with the term counterfeit aircraft?

Ms. GILLIGAN. Yes, sir.

Mr. WESTMORELAND. As a general rule of thumb, would you agree that counterfeit aircraft pose a safety risk both to the occupants of the plane and to people on the ground?

Ms. GILLIGAN. Sir, if I could, counterfeit aircraft is not sort of a term of art, as we would call it, that we use in the industry. I assume you are referring to aircraft which may contain either unapproved parts or an aircraft where the full documentation for the aircraft can't be established in order to assure that all the airworthiness requirements have been met. Is that?

Mr. WESTMORELAND. Well, what does counterfeit aircraft mean to you and what specific guidelines does the FAA have as far as what makes an airplane counterfeit?

Ms. GILLIGAN. Again, I don't believe the term, counterfeit, is a term that we have used.

Mr. WESTMORELAND. What term do you use?

Ms. GILLIGAN. But I can certainly look into it.

Mr. WESTMORELAND. What term do you use?

Ms. GILLIGAN. Quite honestly, I am not sure what concept you are trying to pursue.

What we do have are aircraft that must meet certain standards, and when they do, they get an airworthiness certificate. If there

are elements of the aircraft that are not appropriate, that are either unapproved or again we can't document that, in fact, the aircraft is airworthy, then it is not airworthy. Counterfeit is not really a term that we use in that context.

Mr. WESTMORELAND. So if a plane had been issued an airworthiness certificate and a data plate from the FAA, would that be a counterfeit airplane?

Ms. GILLIGAN. Mr. Westmoreland, I think I am familiar with the particular case that you are referring to. Depending on the basis on which——

Mr. WESTMORELAND. Just answer the question. It is very simple. If the FAA issued an airworthiness certificate and a data plate to an aircraft, is that aircraft counterfeit?

Ms. GILLIGAN. If the facts underlying the issuance of those certificates were accurate, then the aircraft would be airworthy. If there is some question that arises after the certificate is issued, then we would pursue that to determine if all the airworthiness requirements have been met.

Mr. WESTMORELAND. Are you familiar with the term harvested aircraft?

Ms. GILLIGAN. No, sir.

Mr. WESTMORELAND. Could you find out if there is any definition that the FAA may have for the term, harvested aircraft?

Ms. GILLIGAN. Sure, certainly.

Mr. WESTMORELAND. What does imminent hazard to safety mean to you?

Ms. GILLIGAN. It is a term that we use to determine whether or not we need to issue something like an airworthiness directive in order to address a known safety of flight issue.

Mr. WESTMORELAND. So if the FAA issues a ferry permit for an aircraft it deems to be an imminent hazard to safety, then would you have a problem with that?

Ms. GILLIGAN. Well, again, I would need to understand the facts. There are times when we issue ferry permits for aircraft that do not meet all the airworthiness requirements so that the aircraft can be taken to a location where proper work can be done. And so, again, I would need to understand the facts.

Mr. WESTMORELAND. Where proper work can be done?

Ms. GILLIGAN. If that is what is necessary.

Mr. WESTMORELAND. To repair the aircraft?

Ms. GILLIGAN. Whatever the basis for issuing the ferry permit.

Mr. WESTMORELAND. But you would issue a ferry permit and send out a pilot to fly a plane that had imminent hazard to safety?

Ms. GILLIGAN. I don't know if a ferry permit is issued with that particular phrase. I do know ferry permits can be issued when the aircraft does not meet all of the airworthiness standards. It is issued with certain limitations to address those risks and usually issued for the purpose of getting the airplane to a place where it could be fixed.

Mr. WESTMORELAND. If an airplane had an airworthiness certificate, then at some point in time it was airworthy.

Ms. GILLIGAN. Someone found it to be airworthy. They may have made a mistake.

Mr. WESTMORELAND. Since 1988, do you know how many aircraft have been deemed counterfeit—I will just use that term—by the FAA and seized by the Government?

Ms. GILLIGAN. No, sir, I don't.

Mr. WESTMORELAND. Could you find out for me?

Ms. GILLIGAN. We can try.

Mr. WESTMORELAND. Also, if you would, while you are looking for that information, could you also find out for me of those planes that were seized, how many of those forfeiture cases have been dismissed and what happened to those aircraft after the forfeiture cases were dropped?

Ms. GILLIGAN. Certainly, we will see what we can find out.

Mr. WESTMORELAND. Thank you.

Just in the brief time I have left, Mr. Hickey, you issue the airworthiness certificates?

Mr. HICKEY. My organization does, sir. Yes, sir.

Mr. WESTMORELAND. Your organization does. Are you familiar with the term, counterfeit?

Mr. HICKEY. Not in the way you are using it, sir.

Mr. WESTMORELAND. So what would you call it?

Mr. HICKEY. Again, I look at airplanes through their airworthiness certificate and whether they have all approved parts or not. I am not familiar with an official terminology called counterfeit, sir.

Mr. WESTMORELAND. But an airworthiness certificate should indicate that the plane is airworthy?

Mr. HICKEY. As Ms. Gilligan indicated, it did at one particular point in time, at the time it was presented to the FAA and with the facts known at that time, that is correct, sir.

Mr. WESTMORELAND. A data plate would be issued from your office also?

Mr. HICKEY. That is correct, sir.

Mr. WESTMORELAND. Okay, thank you.

No further questions and I yield back.

Mr. COSTELLO. The Chair thanks the gentleman and recognizes the gentleman from New York, Mr. Hall.

Mr. HALL. Thank you, Mr. Chairman and Ranking Member and thanks to all of our witnesses.

Chairman Rosenker, the FAA earlier this week released data revealing that the level of flight delays during the first four months of this year have been the worst on record. This is particularly troubling in New York, home of the top three worst all-time records of all major U.S. airports.

Stewart Airport in my district is poised to alleviate some of that congestion when the Port Authority assumes control of its operations in the near future. With the increased level of traffic, there will undoubtedly be need to have more bodies in the control tower to successfully, efficiently and safely take on the increased number of operations.

Currently, Stewart has a contract tower. Do you think that the NTSB fatigue recommendations should be implemented at contract towers in the same way they are implemented in other towers and do you believe that such an implementation will take place?

Mr. ROSENKER. Clearly, anyone who is involved in the controlling of aircraft, whether they be contract or whether they be FAA em-

ployees, we believe should have the appropriate rest, scheduling should be done in a scientific manner, and be competent and alert to do the work, whether it is contract or whether it is government employees.

Mr. HALL. Ms. Gilligan, did you want to respond?

Ms. GILLIGAN. Certainly, sir. The air traffic organization is looking very closely at the Board's recommendations. The schedules that FAA has been implementing up until now were negotiated agreements with the controller union, and we will be working with the union as well as we review the NTSB recommendations.

At this point, I have not heard discussion of whether or not it would be applied to contract towers, but as the Chairman suggests, certainly as safety professionals, what we look at is whether or not an issue exists and how to address it throughout the industries. So I would expect that contract towers would gain the benefit of whatever changes FAA makes as a result of the Board's recommendations.

Mr. HALL. That makes sense.

Ms. Gilligan, I want to ask you also, you state in your testimony that no regulatory scheme can instill the personal commitment needed to manage fatigue.

In 2005, the Part 135 industry participated in the Aviation Rulemaking Committee and developed a number of proposed recommendations including a significant change in the industry's flight duty and rest rules. What are these recommendations and when does the FAA expect to initiate the rulemaking process based on these recommendations?

Ms. GILLIGAN. Actually, sir, that committee made about 140 recommendations for improvements to the Part 135 regulations. As Chairman Rosenker has made mention, what we are trying to do is parse those recommendations so that we don't just have a huge regulatory project that becomes very cumbersome and difficult to get through the process.

We are starting actually with the recommendations related to crew resource management, also a part of the Board's recommendations, and that will be one of our first rules. The recommendations on fatigue will follow that rule. I don't currently have a schedule for when we would take up those fatigue changes or those changes to the rules on scheduling.

The recommendation is actually quite interesting to us because the industry recommended sort of three options and that operators, depending on what the operating environment is, they might pick one or the other, either prescriptive rules as we have now or two other options that give a little more flexibility but that also allow for perhaps the application of the science of fatigue to be more effective. So we will be going forward with those proposals, but again I don't have a schedule for that particular part of the rulemaking right now.

Mr. HALL. Thank you.

Lastly, I would like to ask you if you could explain, Ms. Gilligan, the flight that is mentioned in your testimony that was just approved for over 16 hours duration using a fatigue risk management approach. I am curious what exactly that is. Could you explain that, please?

Ms. GILLIGAN. Sure, I am glad to. Actually, we are working with the International Civil Aviation Organization to look at fatigue as an area of risk and determine how we can better manage it and mitigate it.

The schedule that we have approved is for a flight between Kennedy Airport and Mumbai, India. The operator came in after having worked with experts in the area of fatigue. They also had their plan reviewed by an independent expert, and we have had it reviewed by our experts at the Civil Aeromedical Institute in Oklahoma City. Their plan actually applies a lot of what we have learned about how to manage fatigue.

So they have committed to protect a day of rest before the flight. They will actually get their crews in a location and protect the day, the rest period before the flight. The scheduled rest during the flight will occur during the circadian rhythm low that the crew would experience, and there is protected rest when they arrive at the other end as well. It applies not just to the flight crew but also to the cabin crew.

That is the kind of approach that we are looking to develop with ICAO in terms of managing the risks that can be a part of these long term operations, long haul operations.

Mr. HALL. Thank you.

I would assume that you are consulting with your unions and the workforce on the different aspects, be they pilots, controllers, other crew, ground-based crew, et cetera, about the same fatigue management.

Ms. GILLIGAN. Yes, certainly. We have had a number of rulemaking committees to try to address the issue of fatigue, and they have always included both the operator and the pilot community. We will certainly continue to pursue that.

Mr. HALL. Thank you very much.

Thank you, Mr. Chairman.

Mr. COSTELLO. The Chair recognizes the gentleman from Texas, Mr. Poe.

Mr. POE. Thank you, Mr. Chairman. I thank all of you for being here.

Mr. Haueter, I want to talk to you about the famous black box that is probably orange. What is the backup system to the black box?

Mr. HAUETER. Well, currently, there is two. There is a cockpit voice recorder and a flight data recorder. Those are the main devices on the aircraft.

We have asked for a combi-recorder which, combi is both a flight data recorder and cockpit voice recorder, one effectively at each end of the aircraft so you would have redundancy there.

Mr. POE. What about using some type of satellite system so that you have immediate knowledge of the information that is on the black box? We always here, well, we will know something when we find the black box.

Would it be more immediate? Would it be a better safety system? What is just your opinion about that?

Mr. HAUETER. That has been discussed for some time. The issue we have is the bandwidth in terms of nowadays an aircraft with 1,000 parameters, looking at data at eight times per second for

many of those parameters, trying to ensure we don't lose data in the process.

It has been discussed for a while, and also in terms of number of aircraft flying. When you have thousands of aircraft in the air, this is a lot of data now being transmitted. So far, the people we have talked to, no one has come up with a solution to all the technical issues.

Mr. POE. They have or have not?

Mr. HAUETER. Not that we have seen.

Mr. POE. Ms. Gilligan, I want to talk to you and ask you about the air traffic controllers. In your opinion, do you think it is the number of air traffic controllers, the number of flights, the delays that we all know about, do you think it is at a crisis or not, the number of air traffic controllers?

Because they are all getting grayer. I mean it is the baby boomers. They are still air traffic controllers.

Ms. GILLIGAN. I am getting grayer.

Mr. POE. No offense; I am a baby boomer myself.

Ms. GILLIGAN. I am afraid we all are.

As you know, the agency has a very aggressive plan for hiring air traffic controllers in preparation for what may be increases in retirements over the coming years. As you also know, the hiring of controllers occurred after the strike of 1980 and 1981, and so there are sort of classes of controllers who are coming to the ends of their careers. The agency is very active in trying to plan for that, trying to anticipate what that level of retirement might be.

At this point, we are making those staffing numbers. In my organization, we have an oversight responsibility for the air traffic organization. We are monitoring their plan, and they are meeting their plan. At this point, we do not see a crisis.

Mr. POE. So you don't think it is a crisis at all?

Ms. GILLIGAN. I don't see a crisis now, sir, no.

Mr. POE. Thank you, Mr. Chairman. I yield back.

Mr. COSTELLO. The Chair recognizes the gentlelady from Hawaii, Ms. Hirono.

Ms. HIRONO. Thank you, Mr. Chairman.

I have a follow-up question regarding the management of fatigue. There is a lot of research being undertaken on how we can manage operator fatigue in all industries including the aviation industry. I am sure you are familiar with some of this.

You indicated that you referred to the science of fatigue. Now there is technological research being done on coming up with ways that we can monitor the individual's fatigue factors right there on the spot. Is the FAA open to this kind of utilization of this kind of monitoring facilities or capability?

Ms. GILLIGAN. I mean we are certainly open to it. Some of our past research that we funded through NASA included monitoring performance, both on the flight deck and off duty as well. We have not considered some kind of monitoring of the actual operation if that is what you are suggesting.

Ms. HIRONO. The actual operator, so real time. I can envision a situation where a person, a pilot, for example, flying 15 hours or something, right there on the spot can have his or her fatigue factors monitored so that in real time you will be able to ascertain as

opposed to either preflight or that kind of technology or process that you are using now.

Basically, my question is the implementation of technological advances to manage fatigue, is that something that FAA is actively interested in and pursuing?

Ms. GILLIGAN. Again, we have used that kind of technology to try to understand and evaluate fatigue. We have not considered requiring crew members to be monitored during the course of their operation. Quite honestly, it is an interesting thought, and certainly we can consider that, but we have not up until now.

Ms. HIRONO. Thank you.

Ms. GILLIGAN. Thank you.

Mr. COSTELLO. The Chair recognizes the gentleman from Arkansas, Mr. Boozman.

Mr. BOOZMAN. Thank you, Mr. Chairman.

I had a question about the fact that currently large portions of the commercial and private air routes are blocked off when we have space launches, things like that. It seems like with everything that is going on, that the deconfliction between air and space is going to increase with time. I guess I had some questions about what we were going to do in the future, how we are going to manage that as commercial space flight by Virgin Galactic and all that stuff comes on board.

I guess what I would like to know is what the FAA and DOD, how they are coordinating the space launches in particular right now. Also, I know in Huntsville they are working on software programs to minimize the disruptions space launches will have on commercial flights. Is FAA coordinating with the Army in that regard?

Then again as the FAA develops the next generation air transport system, how is that interfacing? What are we doing to make sure that that is going to be up and running and appropriate to handle the deconfliction?

Ms. GILLIGAN. Congressman, I probably don't have as much detail as you might be interested in, and we will be glad to supplement the record to the extent that I am not able to respond here in the moment.

But as you know, we do have a commercial space organization within the FAA. We do have responsibility both for setting the safety standards as well as for promoting the new commercial uses of space transportation. The Commercial Space Office coordinates closely with our air traffic organization when these space launches are scheduled.

Concerned is probably too strong a word. We are aware that as access to space increases, it will have to be properly integrated into the national airspace system, and we are working to accomplish that. The Commercial Space Office coordinates very closely with all parts of the Department of Defense in current launching as well as preparing for the future. So I do think we have the right interfaces there. I don't know that we have all the answers yet.

Mr. BOOZMAN. In regard to what they are doing in Huntsville, are we specifically interfacing with the Army?

Ms. GILLIGAN. My understanding is that that is the case, but again let me confirm with the Commercial Space Office and we will confirm that back to you.

Mr. BOOZMAN. Good. Thank you.

Mr. Chairman, with your permission, I have got just two or three other specific questions if we can submit.

Mr. COSTELLO. I would be happy to do that and submit them for the record, and we will ask that the witnesses answer your questions.

Mr. BOOZMAN. Thank you, Ms. Gilligan.

I yield back the rest of my time.

Mr. COSTELLO. The Chair thanks the gentleman and recognizes the distinguished Chairman of the full Committee, Chairman Oberstar.

Mr. OBERSTAR. Thank you very much, Mr. Chairman, for holding this hearing and, Mr. Petri, thank you also for your participation and splendid efforts that you both invested in bringing this hearing about. This is one of the most important things we do in aviation and in all of transportation is attend to the needs of safety.

In that regard, the FAA is the premier safety agency for aviation in the world. I said that at a hearing a few weeks ago. I emphasize it again today. The rest of the flying community in the world looks to the FAA to set the standard. ICAO has a role, but FAA is the gold standard.

The role of the NTSB is to make sure the FAA stays at the gold standard level because the NTSB's role—and I will say it again—is normative, not measured by benefit-cost analysis which is the role of regulatory agencies, operating agencies, but the role of the NTSB is to set the standard and then to measure agencies, modal agencies by how they adhere to that standard.

This goes back to the dawn years of aviation, in 1926, when engines had a bad habit of falling off aircraft in flight, wings regularly fell off aircraft en route with very bad consequences.

It was an Assistant Secretary of Commerce who thought this was terrible for the future of air commerce and advocated within the department for rules of safety in manufacturing aircraft and operating aircraft and was rebuffed until he became Secretary of Commerce. Then in that position, he issued rules for aviation safety.

His name, Herbert Hoover. We don't associate Herbert Hoover with a lot of good things in history since he was either the inheritor of or the progenitor of the Great Depression, but he saw the need for safety in aviation maybe not for the individual benefit of pilots. I think he was just at the dawn of passenger travel in aviation. But he saw the need for safety, and he insisted that there be a government role to regulate safety and set standards.

NTSB is the inheritor as is the aviation safety function of FAA.

Now you have set forth several key points: incursions, fuel tank flammability, recorders, cockpit resource management training and fatigue and others, but I want to deal with that.

Incursions, Mr. Rosenker, Chairman, thank you very much for your vigorous pursuit of the role of NTSB and to all your board members who have taken their responsibilities with great seriousness.

You have labeled unacceptable the FAA response on runway incursion. Runway incursion is one of the most important aviation safety sectors in the world. Controlled flight of a terrain outside the United States is the number one cause of fatalities, but in the U.S. and elsewhere, incursions. There is a range of technology now available.

Why, Chairman Rosenker, is FAA not responding in an acceptable manner to the Board's recommendations?

Are they, as in the early days of technology to avoid in-flight accidents, waiting for the next perfect technology or what is it?

Mr. ROSENKER. Sir, I hate to speak for my colleagues. I am confident that they will be able to respond for themselves.

But I said earlier and I will say it again. On behalf of my colleagues at the Board and the staff, we appreciate very much the work in the past 24 months that has been done to try to begin the process of eliminating runway incursions.

They have created some technologies that in fact they have experimented with and appear to be working extremely well, one of which is located in Dallas, another up on the West Coast called the ferrous lights. The runway status lights are the ones in Dallas, and I believe they are getting ready to do another experiment in San Diego with the runway status lights.

Now, again, these are technologies which are incorporated into the technologies they are already using, AMASS and ASDE-X, but what this technology will do is give a direct warning, a direct communication to the cockpit crew so that they can act. Eight to eleven seconds of potential gap before information is passed to the cockpit crew could prove to be catastrophic.

So it is not as if we are disappointed in what has happened so far. Again, we would have liked to have seen a much more expeditious implementation of our reg except that at this moment, in the past 24 months, it seems like we have come to some sort of stop in the process in that we are looking for a decision, and we believe that the technologies which they have shown so far appear to be very, very good and can begin the elimination of these potential catastrophic consequences.

Mr. OBERSTAR. Thank you.

Ms. Gilligan, Mr. Hickey, what are your responses?

Ms. GILLIGAN. Mr. Chairman, as Chairman Rosenker indicates, we have been testing lighting systems, a couple different kinds at a couple different locations, and we have demonstrated what we believe are two important things. One is that they work, and second is that they do not have an unintended consequence of creating additional burden for either the flight crew or the controllers.

As you know, when we introduce technology, we want to be sure we are not fixing one problem but introducing some new or unidentified risk, and we do see that the lights will work and that they don't add some additional risk.

We are taking those programs through the acquisition process. There will be a decision made later this year as to whether or not and at what level to fund those programs. After that, we will have a program for implementation.

Mr. OBERSTAR. Are you speaking of the direct pilot warning system and the ASDE-X and the ferrous?

Ms. GILLIGAN. Right, the runway safety lighting and ferrous, those two systems have both been tested, and we will pursue acquisition of the appropriate, whichever one is appropriate for whatever circumstance.

As you point out, though, they are related and they rely on the ASDE-X technology as well. So we will need to link the lighting systems to those locations where we also will have AMASS or ASDE-X. So those technologies are coming along.

Mr. OBERSTAR. Do you anticipate a rulemaking by the end of the year?

Ms. GILLIGAN. Well, these would be technologies that FAA would acquire that would be at airports, and so it is not a rulemaking.

Mr. OBERSTAR. The FAA then would not need to issue a rule but just implement the technologies. Put it in place.

Ms. GILLIGAN. For these technologies, that is correct.

But I do think something to be mindful is what we are really looking for here is to make sure pilots have the most situational awareness they can possibly have. In fact, just in the spring, the Administrator announced that we have now refined our approval process for technology in the flight deck that will allow the pilot to know where their aircraft is on the airport surface. We have those under review and approval at this point.

Mr. OBERSTAR. That is from the aftermath of the Kentucky accident. Situational awareness on the ground is critical as well.

Ms. GILLIGAN. Correct, correct. You are right. There are applications beyond just runway incursion. The more the pilot can be familiar with where the aircraft is on the airport surface, then the more assurance he can have or she can have that they are in the right location at the right time.

Recent improvements in technology and how quickly some of these technologies are improving allow us to be able to have that application for use on the surface. As I said, we have got an applicant under review, and we do have airlines that have committed to put that technology in their flight deck once it is approved. We think that is another key element to addressing this issue.

Mr. OBERSTAR. There are least 130, 140 airports where the on the ground runway/taxiway system is confusing. Has the Board looked at that situation and have you made recommendations? Is the FAA preparing to respond to improved training and awareness for pilots?

Mr. ROSENKER. Clearly, we are very interested in that. We are making recommendations we will be presenting in our Sunshine Meeting on the 26th of July, the Comair accident that occurred in Lexington. So that will be 11 months after that accident occurred. We will have a determination of probable cause and making recommendations concerning that specific accident. But many of these recommendations could apply to other situations as well.

Mr. OBERSTAR. I want to thank you. I will follow that very closely.

I want to thank NTSB and FAA for the progress they are making on fuel tanks flammability although I think that needs to be wrapped up with a firm rulemaking.

Flight recorders, the video recording systems that were tested first by Lufthansa in the late 1980s, 1988-1989, is something that

ought to be revisited. I know the pilots union doesn't like that at all, but we can have video in the flight deck without allowing it to be used as an enforcement tool, a penalty tool but as a training device.

Your response?

Ms. GILLIGAN. Yes, sir. As you know, we have tested a number of video cameras just to see, first of all again, do they work. Will they really capture in daylight, night time and those kinds of things? We have done that testing along with the NTSB.

I think when we consider the commercial fleet, given the data recording requirements that we already have, we will have to look closely at whether or not we think we need to include videos. But as we look at those aircraft that do not have the robust data recording and voice recording that some of the commercial fleet has, I think we agree that we need to look more closely at what is the role for video in some of those other aircraft.

Mr. OBERSTAR. Thank you.

Chairman Rosenker?

Mr. ROSENKER. I would agree. Our first objective in our recommendation is to get them into aircraft that have nothing. At this point, aircraft similar to what happened tragically to Senator Wellstone, if we would have had video in that aircraft, if it would have been required, some form of either CVR, FDR or video, clearly we would have been able to make a more timely determination and make recommendations that may not have already necessarily been made.

So that is our primary goal is to get them into the smaller aircraft that have nothing at this point.

Now when you begin to operationally look at those, you will have, I believe, enough evidence that everyone will be in agreement that these new technologies are going to be extremely valuable in the process of accident investigation.

Those again are never, ever, ever used in any way, shape or form other than for accident investigation. We have proven that in our FDR, in our CVR categories. Again, they are using FOQUA in the FDR. Those are never used for punishment. They are used for operational understanding of what happens.

We believe that this type of protection will be there, and we would not like to say in any way, shape or form any of these technologies used for anything other than the furtherance of safety, not for disciplinary action.

Mr. OBERSTAR. Thank you very much, and your reference to Senator Wellstone makes a very personal and heartstrings appeal and pull for me.

I want to encourage both FAA and NTSB to continue working to fulfill the one level of safety objective that was set over a decade ago for Part 121/135, especially the on demand charter, not only with dual pilot operations but also with single pilot operations. Don't limit.

Now my final issue and that is fatigue. Help us also since the objective of safety and the role of the Board and the role of the safety function of FAA is to preempt the next accident. We are going to be moving into the new era of aviation with the pilots flying beyond age 60. It is going to happen one way or the other, ei-

ther through legislation which I expect we will do in this Committee in the reauthorization.

That raises questions about the twice a year medical exam for the pilot in command. Now I question whether that is sufficient, twice a year for the pilot in command, twice a year navigation motor skills, flight check and simulator. Shouldn't it be extended if we are going to extend the years in service of pilots?

Shouldn't that be extended to the first officer? That is, right now, the first officer is not required to have twice a year medical check, twice a year flight checks, motor skills.

I think we ought to have a more rigorous assessment, and twice a year would seem to me to be a good standard for proficiency tests. Putting the first officer in addition to the pilot in command through low fuel, hydraulics failure and the ability to process, retain and repeat commands from air traffic controllers. I think those are very, very critical in-flight skills that ought to be tested more frequently for the first officer as well as for the pilot in command.

Ms. GILLIGAN. If I may, Chairman Oberstar, in the rule that we are preparing, we are anticipating or we will propose a requirement for the medical review twice a year.

You are correct. Currently, under U.S. rules, we do allow commercial pilots rather than ATP pilots to act as a co-pilot. To be consistent with the ICAO requirement however, we will propose to have the medical review done twice for any pilot over age 60.

As to the testing, that will actually remain consistent with what it is that the airlines currently do. I think as you know, under our rules, there are certain prescriptive timing for testing, but we also have some programs like advanced qualification programs which change those time periods somewhat, but we would allow the pilots to continue to be tested under the airline training and testing program. At this point, we think that will be sufficient.

Mr. OBERSTAR. Chairman Rosenker, do you have a supplement to that statement?

Mr. ROSENKER. Mr. Chairman, unfortunately, that is not an issue that we have studied at the Board nor do we have a position at this time.

Mr. OBERSTAR. Thank you.

Mr. ROSENKER. Yes, sir.

Mr. OBERSTAR. The final question I have is about fatigue. There is daily fatigue, and there is cumulative fatigue. Over many years, this Committee has grappled with this issue, pressed for and enacted legislation eventually on flight and duty time.

The NTSB has repeatedly said that the FAA should set working hour limits for flight crews, for aviation mechanics, based on research on fatigue, circadian rhythms, sleep and rest requirements. In addition, training and flight checks, ferry flight, repositioning flights should be included in the crew total flight time. Those are your recommendations.

Now let me transfer that to another mode: railroad. It is well known that the operating crew, the locomotive engineer and the conductor are subjected to limbo time, time when they are neither on duty nor off duty. The railroads have increased the amount of limbo time, the number of shifts in which more than two hours or more of that time in limbo are visited upon the operating crew.

If it is important enough for aviation, and I realize there are differences, that aircraft are five or seven miles in the air, no curb to pull over. You have to have much higher standards. But the railroad is critical too. You can't stop that train on a dime any more than you can stop that aircraft on a dime.

Fourteen hour duty period, ten hours of rest, increase flight time to ten hours and so on, we need to visit the same requirements on operating crews of train, and I know the NTSB has had a number of recommendations on that issue. So I would like to have your further thoughts about limbo time in railroading as an addition to or extension of the fatigue to which operating crews are subjected.

Mr. ROSENKER. Well, Mr. Chairman, I appreciate the opportunity to talk about another mode while I am here at the same time. I get a two-for, I think, that way.

Mr. OBERSTAR. Yes, you do, and we get a two-for.

Mr. ROSENKER. Yes, sir.

I testified for this Committee to talk about issues such as limbo time and crew rest along with positive train control. I will get that in one more time wherever I can. That is a technological advance which in fact when implemented will begin the process of stopping some of these terrible collisions that occur on our rails today.

But when we talk about limbo time, if we can eliminate limbo time, that is one element that we believe will significantly improve the opportunities for our train crews to be rested and alert when they finally come back to work. We would like to see that.

Although we don't call it limbo time in the aviation community, there is a loophole that enables, for example, a pilot to fly after his eight hours on 121, to fly a ferry flight which would go beyond that eight hours and thereby perhaps put him into a fatigue situation.

Mr. OBERSTAR. Airlines or charter operations will call that Part 91.

Mr. ROSENKER. Yes, sir.

Mr. OBERSTAR. And escape the responsibility of Part 121/135.

Mr. ROSENKER. That is exactly right, Mr. Chairman, and that is what we believe can be affected, and we have asked for our colleagues at the FAA to regulate and to improve and to change. I believe that can be done. We hope it is not just done in the issue of changes in 135 but a reform that talks about the entire fatigue issue as it relates to our air crew members.

We have also, of course, made recommendations to those that deal in the maintenance. We don't want those people in any way, shape or form to be working on aircraft when they are fatigued. There are a number of environmental issues which in fact affect the way they work, and many of these, of course, these maintenance workers, are doing their work overnight in some of the most difficult sleep patterns and also in some of the more challenging environments.

So we would work. We would like to work with our colleagues at the FAA to get those specific changes implemented and implemented as quickly as possible.

Mr. OBERSTAR. Thank you very much.

I won't ask Ms. Gilligan to respond to rail questions.

Mr. Chairman, I thank you and, Mr. Petri, I thank you.

Mrs. Moore, thank you very much for your patience.

These are critically important issues, and I spent a good deal of my service in Congress in them, and I appreciate the opportunity to explore them in further detail.

Mr. COSTELLO. Thank you.

The Chair recognizes the gentlelady from West Virginia, Mrs. Capito.

Mrs. CAPITO. Thank you. Thank you, Mr. Chairman.

Mr. OBERSTAR. Sorry, Mrs. Capito. I still think of you as Shelley Moore.

Mrs. CAPITO. That is good.

I have a quick question. It is not on the most wanted list, but it is something I have wondered about flying a lot in smaller aircraft between here and West Virginia, and I think it is unsettling to the traveling public and more and more people are on flights. I think the flights are much more crowded than I have ever seen them.

When you get on a plane, and they start shifting people around or they ask one person to move because of weight or balance or get off the plane, it doesn't give you a real good feeling to think that removing one person is going to be the difference between flying safely and not flying safely. I know the accident that occurred in Charlotte was an incident of overweight, and I believe that was a turbo. Was that a turbo prop plane? I think yes.

For those of us whom this happens to quite frequently, tell us what your perspective is on weight and balance and what direction from a safety standpoint the airlines are going on this and the FAA.

Ms. GILLIGAN. Congresswoman, if I could, I would ask Mr. Hickey who is an aeronautical engineer to perhaps try to address that issue for you.

Mr. HICKEY. Thank you, ma'am. I guess the initial response I would give is I would be comforted by the fact that a person was either moved or removed because it shows, I think, proper diligence by the flight crew that they take weight and balance seriously. All airplanes have a certain sort of envelope in which we approve the airplane. We establish that that is its safe zone. It is probably never more important than on takeoff.

While it might suggest to you it is not like riding a bus or a train where that typically doesn't happen, in an airplane, it is a very ordinary proper function to occur. The margins, though, of one additional person or two additional people being on an airplane is well, I can assure you, well within the margins of safety.

I think historically as we have seen accidents associated with loading, they are egregious, tremendously egregious cases where they are way out of whack. One or two people really aren't the make or break in that case.

Mr. ROSENKER. If I could make just one clarification.

Mrs. CAPITO. Yes.

Mr. ROSENKER. The Charlotte accident was clearly also an issue of a filled aircraft that may have had an overweight situation, but it was primarily caused by the mis-rigging of an elevator, and that really created the opportunity for the aircraft not to have been flown properly.

Mrs. CAPITO. Could you just clarify what misreading of an elevator?

Mr. ROSENKER. That aircraft was in for maintenance earlier in the month or six weeks. I can't remember the exact amount of time.

But what had happened is they mis-rigged it and did not do a maintenance check on it, and therefore they did not know that you could not get full elevator authority out of it. So when you could not get the appropriate amount of elevator, when you combine that with the weight of the aircraft and the number of people that were on the aircraft, that is what created the aircraft crashing.

Mrs. CAPITO. Thank you.

I appreciate, Mr. Hickey, and I do feel good when I know that people are moving around and there is a lot of attention paid to it, to the weight and balance. But knowing that it is important, when you watch the cargo go into the back of the plane, you start thinking now, how much weight really is on this plane? I am sure there are large margins.

Mr. HICKEY. There is.

Mrs. CAPITO. But you know there was the whole controversy on the average size of an air passenger weight being 160 or 170 pounds. There was a little bit of controversy on that. Is that something that has been readjusted or are you still working on that?

Ms. GILLIGAN. No, ma'am. We actually issued new guidance for operators to use. If they want to use a standard weight, they use an FAA weight which we did increase both for the individuals as well as for the baggage. If they want to, they can actually do a survey of their actual passengers and establish their own average weights. But they must do one or the other, and we do over see that.

Mr. ROSENKER. We will take a bit of credit for that, and it was a timely, very, very timely response by our colleagues at the FAA.

Ms. GILLIGAN. Thank you, Mr. Chairman.

Mrs. CAPITO. On that note, I thank you for your answers.

Thank you very much.

Mr. COSTELLO. The Chair thanks the gentlelady and thanks our witnesses on the first panel.

Let me just say that this will not be the last hearing on the NTSB's most wanted. We intend to follow up and to hold additional hearings. As you have indicated, Chairman Rosenker, there has been progress made on some of these issues, but we want to make certain that we continue to make progress. I just want to assure our friends at the FAA and the NTSB that we will continue to monitor these issues, and we will have additional hearings in the future.

With that, I recognize the Ranking Member.

Mr. PETRI. Mr Chairman, I just would ask unanimous consent that some questions from our colleague, Jerry Moran of Kansas, be allowed to be included in the record and submitted to this panel for written response.

Mr. COSTELLO. Without objection, so ordered.

Again, the Chair thanks the witnesses and would ask the witnesses for our second panel to come forward, please.

Ms. GILLIGAN. Thank you, Mr. Chairman.

Mr. ROSENKER. Thank you very much, Mr. Chairman and Mr. Petri.

Mr. COSTELLO. While the second panel is coming forward, I would like to make some introductions. One is Gail Dunham who, as I mentioned earlier in my opening statement, is the President of the National Air Disaster Alliance/Foundation; Mr. William Voss who is the President and CEO of the Flight Safety Foundation; Captain John Prater who is the President of the Air Line Pilots Association International; Ms. Patricia Friend, the International President of the Association of Flight Attendants; and Mr. James Coyne, the President of the National Air Transportation Association.

With those introductions and we are changing name tags around, we will get started as soon as you are seated.

Mr. COSTELLO. Ms. Dunham, I recognize you if you are ready to present your testimony.

I would ask members of the panel to first note that your full statement will be submitted for the record, and we would ask you to summarize your statements under the five minute rule

Ms. Dunham?

TESTIMONY OF GAIL DUNHAM, PRESIDENT, NATIONAL AIR DISASTER ALLIANCE/FOUNDATION; WILLIAM R. VOSS, PRESIDENT AND CEO, FLIGHT SAFETY FOUNDATION; CAPTAIN JOHN PRATER, PRESIDENT, AIR LINE PILOTS ASSOCIATION INTERNATIONAL; PATRICIA FRIEND, INTERNATIONAL PRESIDENT, ASSOCIATION OF FLIGHT ATTENDANTS; JAMES K. COYNE, PRESIDENT, NATIONAL AIR TRANSPORTATION ASSOCIATION

Ms. DUNHAM. Gail Dunham representing the National Air Disaster Alliance and Foundation and NADA/F, also NADF. We were incorporated by air crash family members 12 years ago. We have, unfortunately, thousands of members worldwide: air crash survivors, family members, those impacted by aviation disasters, aviation professionals and those who share our purpose.

NADA/F is a member organization of the FAA Rulemaking Advisory Committee, a member of the Executive Committee, also a member of the TSA Advisory Security Committee. We welcome the opportunity to work with government and industry to promote the highest standards of aviation safety and security.

Let us assume the following about aviation today: Commercial aviation is public transportation. An airline ticket is a contract for safe transportation. The cost of safety is nil compared to the cost of a disaster. The lives of airline passengers are in the hands of the employees who deserve fair pay and benefits and adequate rest time to do their job.

Aviation technology has greatly improved, and there is also excellent affordable aviation technology that exists and is not being used today.

The NTSB Most Wanted List is the cornerstone of our founding goal: safety, security, survivability and support for victims' families. We used to receive an annual status report from the NTSB, and it included references as to why the recommendations were made and actual progress, sort of scientific, technical data on the

progress that was being made on the recommendations. Today, the NTSB Most Wanted List has six recommendations, and it appears that we just don't have the substance and the progress being made.

Three changes in the process which could be helpful to you: In 2004, there was a major change. A swat team just deleted many of the recommendations.

August, 2005, the NTSB and FAA decided to delete perhaps one of the most important safety recommendations, and that was for mandatory child restraints seats for children under the age of two. The FAA completed the studies. The FAA Technical Office in New Jersey does a terrific job. They already completed all of the studies to have the specific seats for the type of aircraft. That was done. The TSO was completed in 2000 in order to have required child restraint seats, but sadly that TSO has languished on someone's desk since 2001.

The third change in the process is the FAA MAC, the Management Advisory Council, which is private meetings of aviation management with the FAA Administrator and little to no public records of these meetings. The MAC appears to be less advisory, and the results imply that it is a council with power over FAA personnel and dictates to yes or no on much needed safety recommendations. If the FAA MAC is going to continue to be this powerful decision-maker, then at least have their meetings open to the public and the media, or at least most of their meetings.

Referring to a GAO report about required child restraint seats, the FAA has been recommending child restraint seats since 1972—this is the last page in my handout—for 35 years. We have required child restraint seats in cars for over 25 years, and we should have required child restraint seats for children on aircraft under the age of two.

There was an FAA study in 1995. I believe it is a flawed conclusion. They said that if the FAA mandated child restrain seats, that people would drive rather than fly. I don't think that is true because people buy seats for their children when they are over the age of two and the airlines sell the child seats for half price.

We are asking for Congress to mandate required child restrain seats. You do rulemaking. We can do rulemaking through the FAA, through the NTSB, but at times it is necessary for Congress to get involved in the rulemaking. That usually moves it forward much faster.

Again, the TSO should just be released, I think, to move it forward.

I have a couple thoughts about money, on how to pay for these recommendations. Stop the diversion of transportation funds. No matter how you fund aviation in the FAA reauthorization fund, ensure that every single penny is for aviation safety and security. Stop the diversion now of funds from the Aviation Trust Fund which is 7.5 percent of the domestic airline ticket tax.

Again, recognize aviation is public transportation, and everyone who works for the airlines must give their all. Congress should mandate that executive airline pensions become part of the airline pension programs, and this would put all the employees on an equal footing to put the company first, and this would create prob-

ably half a billion dollars to benefit aviation and to pay for these recommendations.

We have two pieces of safety recommendations that we are asking you—to mandate safe flight for children under two, upgraded recorders, suggestions about where the money might be located—and I have three things that we are requesting that have no cost.

We are asking you to mandate public hearings for all commercial air cargo aviation disasters. Comair/Delta 5191 in August in Lexington, Kentucky was the worst aviation disaster in 2006, and there is no public hearing scheduled. A public hearing provides time for questions, answers and testimony under oath. At this time, they are planning a three hour meeting to discuss the worst aviation disaster in 2006, and the causes of 5191 were the runway incursions under low staffing in the tower, perhaps fatigue, complex issues.

We are asking that you mandate public hearings for air crash disasters. Family members are smart. We know the difference between a meeting. We know the difference between a lecture and an actual public hearing.

So three recommendations that don't cost money: Mandate public hearings, whistleblower protection and I have a thought about how to improve the process of moving these NTSB most wanted recommendations forward. We need an annual public meeting with the NTSB, the FAA and the National Air Disaster Alliance and Foundation and our members together at the table. Mandate this meeting once a year for public participation to continue the pursuit, our ongoing pursuit of aviation safety and security.

Mr. COSTELLO. The Chair thanks you, Ms. Dunham, and recognizes Mr. Voss.

Mr. VOSS. Chairman Costello, Congressman Petri and Members of the Subcommittee, thank you for the opportunity to discuss aviation safety and the NTSB's Most Wanted List.

The Flight Safety Foundation was founded 60 years ago by industry leaders to identify and solve safety issues. Those leaders believed industry needed a neutral ground where competitors could work together to share information, ideas and best practices for safety. We have been working around the world to fulfill that role ever since.

The oldest and most venerable aviation safety tool is accident investigation. These investigations identify causes that lead to findings and recommendations, and some of these recommendations ultimately find their way to the NTSB Most Wanted List. The NTSB does this better than anyone in the world.

Objective accident investigations will always be an essential part of the safety equation, but today they are only part of a more complex picture. Aviation safety professionals now have much more to work with. They have adapted a more proactive safety management approach. They identify risks and prioritize actions by downloading and analyzing data from FOQUA. These reporting systems that allow pilots, mechanics and others to report problems that would normally go unrecognized. Studies show this type of data can give us hundreds of warnings before a crash occurs. By protecting this data and acting on it early, lives are saved.

Within this broader context, I would like to comment on just several items on the Most Wanted List. The Foundation supports NTSB efforts in the area of runway incursion but believes the overall topic of runway safety should also be addressed.

We break the problem of runway safety into three components: first, runway incursions such as Tenerife; secondly, runway excursions such as Southwest Airlines in Chicago or the recent Garuda crash in Indonesia; and lastly, runway confusion such as was apparently the case with Comair in Lexington.

The runway incursions problem deserves every bit of the considerable attention it has received, but analysis shows runway excursions present a much larger threat than most had assumed. From 1995 to 2006, runway excursions accounted for 29.4 percent of major jet and turbo prop accidents. These accidents typically did not involve mass fatalities and therefore received little attention. Nonetheless, the data suggest these accidents deserve a closer look.

The Foundation supports a recommendation regarding human fatigue. The aviation industry began setting hourly working limits for light crews some three decades ago. Today, it is clear such prescriptive rules are sometimes ineffective. Fatigue risk management systems based on mature science can do a far better job. Fatigue risk management will allow the industry to do more with a higher level of safety for the public and with a higher quality of life for the people doing the job.

Also, the NTSB Most Wanted List supports the introduction of CRM training for the air charter industry. We couldn't agree more. In fact, we are leading industry efforts to go further. CRM training is a good start, but we know from our work with the airlines that an extension of this training, known as Threat and Error Management, can make a good thing even better. Our corporate advisory committee has embraced Threat and Error Management and will promote this concept at thousands of corporate pilots over the next year.

We will not stop there. The next step will be to actively promote this type of training along with CRM to the air charter community.

Even though work still needs to be done on the NTSB Most Wanted List, the aviation industry has done a remarkable job to reduce the number of accidents because over the last decade the industry has adopted a more proactive approach that addresses risks before they become accidents. This proactive approach is based on a foundation of commitment and trust. Trust is a difficult thing to maintain.

The industry and the regulator have been through difficult times, and labor relations are strained. The Foundation takes no position on political debates, but we do issue one caution. Such debates must never be allowed to compromise the free flow of safety information in the system because safety professionals use this information to save lives.

This is not just theoretical. Today's low accident rate means there are people walking around today who would have otherwise died. Unlike the victims of crashes, we can't name the survivors, but they are as real as those who perished. If we had the same accident rate today as we did in 1996, there would have been 30 com-

mercial jet accidents around the world last year. Instead, there were 11.

Perhaps some of us were on those 19 flights that didn't crash. We will never know.

Thank you very much for allowing me to testify. I would be happy to take any questions.

Mr. COSTELLO. The Chair thanks you, Mr. Voss, and recognizes Captain Prater.

Mr. PRATER. Good morning, Mr. Chairman, and thank you for inviting ALPA to testify before the Subcommittee.

I am John Prater, President of the Air Line Pilots Association representing more than 60,000 airline pilots at 41 airlines in the United States and Canada. For 76 years, ALPA has beaten a drum to improve safety in the airline industry. Some have even called us the conscience of the industry. This morning, our voice from the flight deck will speak clearly on issues of safety.

Let me begin by saying that ALPA agrees with the NTSB that a pressing need exists to provide rational, scientifically-based working hour limits for pilots engaged in all airline operations. Simply put, pilots are tired. One reason we are tired is because we are working under antiquated Federal regulations developed when airplanes couldn't fly across multiple time zones. The industry introduced the first passenger jet airliner in the late fifties. It could cover about 3,700 miles and required three pilot crew members.

Today, however, aircraft can cover 12 to 14 time zones for more than 16 hours of continuous flight, easily traveling more than 9,000 miles, certified to fly with two pilots and augmented only when the flight is scheduled longer than eight hours. Commuter airplanes have been replaced by jets carrying 50, 70 to 90 passengers, flying coast to coast. This different world requires different rules.

Unfortunately, current FAA rules do not adequately apply known science into pilot fatigue research, circadian rhythms and realistic sleep and rest requirements. The lack of a defined duty limit in the regulations illustrates our concerns perfectly. With an augmented crew, it is legal to fly from the East Coast of the United States 16 hours to Asia and then immediately fly another 16 hours back to the United States.

Legal? Yes. Fatiguing? I will allow you to be the judge.

Federal regulations require airline pilots to receive eight hours off between flights. This does not equal rest. By the time a pilot finishes up paperwork, catches the airport shuttles, checks into the hotel, grabs a bite to eat, showers, dresses and leaves in time to get through security the next day and conduct another preflight, he or she is lucky to get five hours of sleep between flights. That leads to a massive sleep deficit and chronic fatigue.

ALPA strongly urges you to push the FAA to modernize flight and duty time regulations and rest requirements for the safety of the traveling public.

Why now? Until the post-9/11 round of bankruptcies, we had negotiated contractual safety work rules. Those contract safety rules were gutted under threats of Chapter 11 or in bankruptcy courts. The Federal aviation regulations that govern maximum flight and duty times and minimum rest periods for pilots are now the everyday working standard for many U.S. airlines.

Changing gears, I would like to remind you that the ultimate safety net in our industry is the front line employee. That is why ALPA believes the Aviation Safety Action Program or ASAP should be high on the NTSB's Most Wanted List. It allows front line employees to report safety concerns firsthand, enabling the industry to ensure safety while protecting those same employees.

Recently, ALPA's air safety representatives met with the senior FAA officials and developed new language that will improve these programs and encourage additional ASAP programs at more airlines. We consider ASAP and its partner program FOQUA, which collects and analyzes data indicating potential risk, as standard issue. They are must-have items for airline safety.

As of May 30th of this year, 27 ALPA representative airlines had ASAP. Six United States ALPA represented airlines do not have ASAP, and that is six too many. It is time to implement both of these programs at every airline. These safety programs which allow employees to identify threats will help us prevent accidents.

One more issue belongs on the NTSB list. How many of you have handed your unaccompanied grandchildren to an airline or watched your spouse and kids board after you have dropped them off? You have placed an incredible act of trust, handing over your loved ones to total strangers who will take them in that narrow aluminum tube called a jet airplane to 30,000 feet, thousands of miles, trusting they will arrive safe and sound.

When I was hired as a pilot with Continental Airlines, pilots had to have a minimum of 2,500 hours of flying time, hands-on experience. The captain beside me probably had at least 10,000 hours. Military training programs require several hundred hours of flight time and cost millions of dollars. That airline pilot supply pipeline is now history.

Today, many pilots get the majority of their training in simulators. At some regional carriers, pilots need as few as 200 flight hours, the absolute minimum to be a basic commercial pilot in a single engine airplane, and in just four to six weeks, they will become your first officer, second in command on a 50, 70, or 90 seat jet. These pilots will become captain in less than a year. These pilots are surely talented and dedicated, but that is no substitute for experience.

Our demand is that airlines hiring pilots with flight experience less than the minimum of 1,500 flight hours required to become an airline transport pilot must receive increased new hire training programs at the regional carriers.

I would like to thank you for the opportunity to testify. I will be ready to answer any questions.

Mr. COSTELLO. We thank you, Captain Prater.

Ms. Friend.

Ms. FRIEND. Thank you, Chairman Costello and Mr. Petri for giving us the opportunity to testify today.

Flight attendants, as the first responders in the aircraft cabin and as airline safety professionals, are closely following a number of the issues raised by the NTSB in their Most Wanted Aviation Transportation Safety Improvements. The NTSB has done a good job in identifying many vital and important issues needing improvement, and we applaud their efforts.

Today, however, I would like to focus my testimony on the issue of fatigue. Human fatigue has been a longstanding concern in aviation accident and incident investigative reports. Based on these concerns, research has been done on pilot and maintenance fatigue.

We are here today to tell you that the industry must acknowledge that flight attendant is also a very real and serious concern. We believe that the NTSB's most wanted recommendation setting working hours for flight crews and aviation mechanics, based on fatigue research, circadian rhythms and sleep and rest requirements is flawed because it does not include the need to address flight attendant fatigue.

Multiple studies have shown that reaction time and performance diminishes with fatigue, an unacceptable situation for safety and security sensitive employees. Flight attendants are required to be on board to conduct aircraft emergency evacuations when they are necessary. In addition, they are in-flight first responders who are trained to handle in-flight fires and manage medical emergencies including CPR and the use of external defibrillators.

Furthermore, since September 11th, the security responsibilities of flight attendants have greatly increased. It has become even more important for flight attendants to be constantly vigilant of the situation in the aircraft cabin and aware of their surroundings at all times, and inability to function due to fatigue jeopardizes the traveling public and other crew members. An error caused due to flight attendant fatigue can lead to a tragic loss of life in the event of an in-flight emergency or during an evacuation.

Flight attendant fatigue has already played a role in some incidents. For example, in 1995, an ATR-72 experienced the loss of the rear cabin entry door during the takeoff climb. The flight crew was able to circle around and land safely. The aircraft received minor damage, and one flight attendant received minor injuries.

The probable cause of the incident was the flight attendant inadvertently opening the door in flight due, in part, to flight attendant fatigue. The flight attendant estimated that she had approximately five hours of sleep the night before the incident flight. Also contributing to the incident was a change in the design of the door locking mechanism. If we add the human factors issue of fatigue-impaired judgment and then add the human factors design issue, the redesign of the door, we have a perfect human factors interaction error in this incident.

Fatigue for flight attendants has been growing across the industry in recent years as our members are required to work longer duty days, cross multiple time zones and can have work shifts that are the equivalent of a midnight shift. Flight attendants do not have a regulatory hard limit on actual flying hours in any 24 hour period.

Add to that a reduced rest provision that allows a rest period to be reduced to just eight hours off the aircraft. That has now become the norm. Our members are reporting that in an eight hour rest, they are getting only four to five hours of actual sleep.

Flight attendants are so exhausted that they have informed us they have, in some cases, forgotten to perform critical safety functions including the arming of doors and some have even fallen asleep on their jumpseats.

In 2006, the Civil Aeronautical Medical Institute, CAMI, issued their report on an initial study of the issue of flight attendant fatigue. Based on just limited research, the report concluded that flight attendants are experiencing fatigue and tiredness and, as such, this is a salient issue warranting further evaluation.

Potential mishaps could have devastating ramifications. Fortunately, they have not because of the current overall low number of accidents. Regulatory agencies as well as the NTSB must further investigate and recommend changes to address flight attendant fatigue before a serious incident happens.

To ensure safety of the entire transportation industry as a whole, we must look at all workers that could have an effect on the survival rate of passengers, not just the pilot who operates the aircraft or the maintenance personnel that fix a broken part. We are, after all, operating the equipment that fights fires, provides medical first response, and helps with a speedy evacuation. To say that flight attendant fatigue should not be a concern or that it is not as important because we are not the sole factor that could cause an accident or that we don't operate a moving vehicle is to acknowledge that saving passenger lives doesn't matter.

Again, thank you, Chairman Costello and the Committee, for holding this hearing, and I look forward to answering any questions.

Mr. COSTELLO. We thank you, Ms. Friend, and the Chair now recognizes Mr. Coyne.

Mr. COYNE. I know I am standing between you and lunch, a dangerous spot. I will try to go as quickly as I can.

I submit my testimony, but I do want to briefly summarize it and focus the attention of the Committee on just how glad I am to be here because in past years, frankly, when this Committee and Congress more broadly addressed the question of aviation safety, more typically it was only on the area of airline safety. As you can see from the recommendations from the NTSB, all of these recommendations apply to the other segments of aviation as well as the airlines, and I am very, very grateful that the Committee has seen fit to have a representative from the non-airline segment of aviation.

As you know, NATA, the National Air Transportation Association, represents over 2,000 aviation businesses across the Country, which employ over 100,000 people who provide ground service, who provide air charter, who operate FPOs, who operate aircraft maintenance companies and flight training. All of these small businesses, if you will, are an incredibly important part of our air transportation system.

Hopefully without insulting any other members of the panel, frankly, I like to think of the NATA members as the backbone of aviation across the Country, and we are very glad to be included in this safety discussion.

Of course, the five principle issues before the Committee today, the so-called unacceptable recommendation areas from the NTSB, are especially important to our industry as well. Briefly, I would like to summarize to say that of these five so-called unacceptable response areas of concern, our organization is generally supportive of the recommendations that have been made by NTSB in these

five areas, but we have concerns with the application of some of the NTSB proposals particularly regarding the difficulty of retrofitting existing aircraft to comply with some of the suggested changes.

Specifically, NATA supports the recommendations made by the NTSB in regard to the dangers posed by known icing conditions as well as recommendations to increase requirements for cockpit voice and data recorders and extend the duration of time recorded by this equipment. However, any FAA rules requiring technological improvements should remain what we call forward fitting and not apply to existing aircraft as such upgrades will disproportionately affect small general aviation aircraft.

NATA, however, agrees with the recommendations regarding runway safety and believes that NTSB and FAA are focusing the correct amount of attention to these top concerns especially the runways at large commercial airports.

NATA also contends that the best approach to runway safety must include human factors intervention to complement any technological improvements. NATA provides such human factors training to the industry on an ongoing basis through our Safety First Program.

We are also supportive of the NTSB decision to include revised pilot work hour regulations and crew resource management training on the Most Wanted List. The association has participated in the drafting of a comprehensive proposal mentioned earlier at the FAA on the Part 135 ARC, and we were pleased to hear earlier this morning that they are going to be moving forward with those recommendations in an expedited manner.

Let me also say, however, that the focus of the Committee must not continue to be just on flight safety but more broadly on ground safety. My good friend from the Flight Safety Foundation pointed out the need for looking at excursions as well as so-called runway incursions.

But in addition even to excursions, there is a growing safety hazard at many airports on the ramp and on the taxiways. You will be surprised to know that so far this year there have been more fatalities on the ramps of airports in the United States than there have been in the commercial operation of those aircraft in the air. The ramps today are an incredibly crowded spot.

We, of course, at NATA have launched something called the Safety First Program dealing with ramp and ground safety broadly for our FPOs and airline service employees. We have made tremendous strides, and we hope that the Committee and the NTSB and the FAA will continue to focus on this.

In addition, I want to stress that the air charter segment is an incredibly important focus of this Committee's attention. Just yesterday, there was a tragic accident in Lake Michigan, involving six passengers on a medical flight. Of course, Senator Wellstone's flight tragedy was a charter flight.

The charter industry has only recently become a priority at the FAA. Up until a few years ago, they only had one employee in the entire FAA, looking at charter safety. If I may compliment them, in the last year they have significantly broadened this.

We in the industry as well have developed a lot of proactive, new charter safety recommendations, most especially our new focus on

safety management systems. Just last week, we created the Air Charter Safety Foundation in cooperation with the Flight Safety Foundation. So we are very keenly interested in raising the bar for safety in air charter.

Specifically, of course, the NTSB recommends more investment in crew resource management in the 135 world. We worked very hard with the FAA on the ARC to develop these recommendations, and we support your efforts and NTSB's efforts to have these crew resource management recommendations put into law as quickly as possible.

I look forward to your questions. Again, thank you for letting me be here.

Mr. COSTELLO. We thank you, Mr. Coyne.

Mr. Voss, a couple of questions, one concerning both your testimony and the reference Mr. Coyne made on not only runway incursions but excursions as well. I wonder for the record, and then I will get into issues concerning icing conditions. But I wonder for the record if you might elaborate, and then I am going to ask Mr. Coyne to as well for the record to talk about not only the runway incursions.

I think we discussed it with the first panel but the point that you made about excursions and please elaborate.

Mr. VOSS. Thank you.

Yes, runway excursions are a problem that occurs rather frequently, but again since it does not have normally severe consequences, it gets a fairly low amount of emphasis. However, when we step back and look at the problem, as I said, 29.4 percent of the major damage to turbo jet and turbo prop aircraft, that is a really significant number, and it has been that number for quite a long time.

This is related to a number of factors. It has to do with the fact that we could do a better job getting pilots information on whether or not they could stop. That involves airports, air traffic control, runway friction measurements. Also, we could do a better job mitigating with certain enhancements to the airport.

There is also issues associated with having stabilized approaches and whether air traffic control is contributing to non-stabilized approaches.

All these things appear to be underlying issues that need to be examined. Given the fact that this has such a high frequency of occurrence, it is a risk that needs to be treated because we should be dealing with both those things such as runway incursions that occur infrequently but have very serious consequences; as well, we should be looking at things that occur frequently which have less serious. Both sides of the risk spectrum deserve to be looked at.

Thank you.

Mr. COSTELLO. Mr. Coyne, if you would like to comment and elaborate on your statement that more people have been killed on the ramp, please elaborate for the record.

Mr. COYNE. Of course, just last month in Detroit, tragically, a young man was killed operating a tug pulling an airplane and had the misfortunate of colliding with an airplane and losing his life.

We have seen the ramp accidents, frankly, start to decline with the implementation of the Safety First Program. You are familiar,

of course, with Midcoast Airport there in Cahokia where they have fully implemented the Safety First Program and haven't had a single incident since they have done so.

The importance on excursions cannot be overemphasized because this couples together the human actors of the cockpit, the air traffic control system, all coupling together plus the footprint on the ground.

Take the example at Midway. You are familiar with just a year and a half ago when Southwest Airlines excursioned off the end of the runway. That is an example of how an excursion occurs when a pilot is faced with difficulties in terms of getting the airplane properly set up for the approach and the facility, the limitations of the airport itself, the runway, the length, especially of course in very difficult weather conditions they had there.

We in the small airplane world are especially concerned about runway excursions. Frankly, big airplanes like Southwest tend to survive these excursions more successfully than small airplanes do. And so, we have situations as in Teterboro a year and a half ago where a small airplane, relatively small airplane went off the end of the runway and created loss of life.

We are very, very concerned about this, and part of the issue is the size of the airport. There are, frankly, not enough 5,000 foot long runways in America today. We have too many airports where for one reason or another—in many cases it is just the opposition of the local community—we haven't lengthened the runway sufficiently to deal with the needs of the newer aircraft.

Mr. COSTELLO. Ms. Friend, I would like to give you an opportunity to elaborate on the fatigue issue.

Every Member of this Subcommittee and, of course, of Congress flies frequently. I fly at least twice a week, and I make it a practice of talking to the flight attendants and asking them how long they have been working, where the flight originated, where they go from my destination if it is in St. Louis or it is DCA. It is not unusual for me to hear from a flight attendant that they had three or four hours sleep before their next turnaround and next flight.

I think there is a misconception when they talk about eight hours rest. It is not eight hours rest. It is eight hours off the aircraft. I wonder if you might elaborate.

Ms. FRIEND. That is correct, and I think Captain Prater referred to that as well. The eight hours incorporates the transportation time to and from the layover hotel, time to eat, preparation time for bed, preparation time in the morning, so all that. Then you have to find some time to sleep in the middle of that.

Several years ago, working with our fellow unions representing cabin crew and flight attendants in this Country, we came to an agreement on some rest and duty times that were implemented for flight attendants. It was intended to be the absolute floor because all of us had the experience and the confidence that we could bargain better duty and rest times at the bargaining table in our collective bargaining agreements.

As all of you are surely aware, we have just gone through probably the most difficult economic times in this industry. What we learned as a result of that and the tough bargaining we went through, as you can imagine, one of the things that our employers

were looking for was increased productivity, and increased productivity results from flying more hours for an individual and reducing the overall head count.

So what we learned is the floor that we worked on all those years ago is inadequate because that is now what we are living with, what was intended to be the floor.

We did, Congress did in 2005, in response to our request, fund and direct the FAA to begin a study on the issue of flight attendant fatigue. The FAA gave the study to CAMI which is fine, but they only gave CAMI six months to complete the study. After restricting CAMI's time to six months, they then took an entire year to themselves to review the results of the initial study that CAMI had done.

What CAMI's initial study came back with, and the study was very limited. It involved really a review of existing literature worldwide. They recommend a further, more in-depth study be carried out. We are hoping to get that additional study funded this year so that we can get a better understanding on exactly what is needed to alleviate this increasing fatigue among flight attendants.

Mr. COSTELLO. I thank you, and the Chair now recognizes the Ranking Member, Mr. Petri.

Mr. PETRI. Thank you very much.

I wonder, Mr. Coyne, if you could talk a little bit about the impact, if any, of the new roll-out of very light jets on safety and congestion at airports and on the ramps.

Mr. COYNE. Of course, the first two manufacturers of so-called very light jets or VLJs, Eclipse and Mustang, have now completed their FAA certification, and those aircraft are in fact being delivered to customers at a relatively slow rate right now. My guess is that at the end of the year there may be as many as 50 of these airplanes in the hands of customers, perhaps next year another several hundred.

However, I think in the immediate, there has been a bit of overhype of the impact of this. Small aircraft have been around for years and years, decades. In fact, small fast aircraft have been around for decades. The Citation, the first small private jet, when it first came out, really wasn't much bigger than these VLJs and essentially operates in the same way in the airspace with single pilots often and relatively high speeds over 350 knots. That is what we are expecting to see in the VLJ market but just a more dramatic and, we think, healthy growth.

The key issue here, as it has been from a safety point of view, as it has been with small aircraft in the past and especially owner-flown aircraft, is for training to be advanced. We think that the industry is as committed to training these new pilots as they ever have. Of course, most often the pilots are not literally new pilots. They are pilots with thousands of hours of experience in other aircraft.

But the training in these new aircraft is paramount. We in our industry, of course, are working with the charter community to make sure that programs exist, especially safety management systems exist in the charter operators of these aircrafts so that the training of their pilots is equal to or surpasses the training that airline pilots get.

Mr. PETRI. In your testimony, I think you referred to the concept of a safety management system. I wonder if you could elaborate on it a bit and how it affects the operation of participating companies.

Mr. COYNE. We happen to believe that the safety management system—and thank you for that question—is one of the most important things that is occurring in the private sector in aviation.

The concept of safety management system, it is not that hard to understand. It is essentially within an organization, creating a mechanism, a management mechanism to ensure that every single person in the organization, whether it is a huge airline or a five employee charter business, that every person in that organization understands that managing safety is their responsibility. It is not somebody else's responsibility. It is their responsibility.

They create in that company. It is a company-focused activity, and in the company, they create a mechanism for managing safety just like they have a system for managing their checking account. Of course, it is important to understand, like a financial management system in a company, it is much more than just having a checking account and balancing your checkbook.

So too in safety management, it is much more than just having a checklist when you are about to take off. It really invests in the whole organization through a series of audits, constant training and data collection, trying to look in the business to collect data that you can use to monitor whether you are meeting your safety targets.

Frankly, the SMS world got started in the military over 40 years ago. The airlines, of course, moved into it I think probably 25 years ago or longer. Now it is finally, if you will, getting into the charter segment of aviation, and this is really an important development because these companies historically don't have the resources to invest in safety personnel that the airlines might have had.

They are developing through the help of computers and technology and the internet. They are developing the resources. No matter how big or small their company is, they are developing the resource to create the same kind of professional safety management structure that has helped contribute to the safety record in the airline industry for the past 20 or 30 years.

We are very excited about it. We have the help of the FAA to help launch many of these SMS training programs, and we hope over the next year, especially with the launch of our new Air Charter Safety Foundation, that SMS will become a requirement literally in the United States for Part 135 as it is already in Canada.

Finally, I should quickly say that SMS is also being used by ground companies, FPOs and others on the ground, who are concerned about safety on the ramp, and we have been implementing that through our Safety First Program for over five years now.

Mr. PETRI. Thank you.

Mr. COSTELLO. Thank you.

The Chairman now recognizes the distinguished Chairman of the full Committee, Chairman Oberstar.

Mr. OBERSTAR. Thank you, Mr. Chairman.

I want to thank this entire panel and welcome you to the Committee. Along with the Chairman and Ranking Member, we greatly appreciate your contribution to safety. To those such as Ms.

Dunham who is an advocate for safety and with personal experience, you understand the stakes that await us and are before us in every issuance of rulemaking and every action taken by the regulatory agencies as well as the operating companies, the airlines themselves.

Ms. Friend, it took 14 years of wheedling, cajoling, pressuring, asking, hearings conducted in this committee room to press the FAA to begin a rulemaking, and then it took an act of Congress to get it enacted and finally promulgated, even after the act of Congress, took us a couple of years of your work—you, the flight attendants organization, and Members of this Committee on both sides of the aisle—to publish a rule in 1996.

Now that law, it is two pages of printed documentation, says:

No certificate holder may assign a flight attendant to a scheduled duty period of more than 14 hours—and then a number of other limitations—14 hours but no more than 16 hours if the certificate holder has assigned to the flight or flights in that duty period at least one flight attendant in addition to the minimum flight attendant complement.

Are they doing that?

Ms. FRIEND. Yes, they are.

Mr. OBERSTAR. Certificate holder may assign a flight attendant to a period of more than 16 hours but no more than 18 hours if the certificate holder has assigned to the flight or flights at least two flight attendants in addition to the minimum flight attendant.

Are they doing that?

Ms. FRIEND. Yes.

Mr. OBERSTAR. Are they in compliance?

Ms. FRIEND. Yes, they are in compliance.

Mr. OBERSTAR. My guess is they wouldn't be if we hadn't written it into law.

Are they complying with the scheduled duty period of more than 18 but no more than 20 hours if the duty period includes one more flights that land or take off outside the 48 contiguous states and the District of Columbia and so on? Are they in compliance with that?

Ms. FRIEND. Yes.

Mr. OBERSTAR. The problem is that the economic pressure on the marketplace, fewer aircraft, one-fifth fewer aircraft than the fleet we had prior to September 11th, the pressure on the airlines in the marketplace to operate those aircraft more continuously, keep them more in service puts pressure on flight deck crew, Captain Prater, and on the cabin crew, resulting in the situations that you have described for us: inability to function due to fatigue, impaired judgment.

The eight hours rest doesn't really mean eight hours of sleep. Often times it buys you only four or five hours of sleep.

There is flight time and there is duty time. Flight time, we finally caused, through this Committee's work, the FAA to write a definition into law of when flight time begins and when it ends, when the brake is released and when the brake is applied at the end of the flight. But then surrounding that, encapsulating that is duty time, and that is both for the flight deck crew and the cabin crew.

Under what circumstances does that time come to be expanded?

Ms. FRIEND. Sir, we both have comments.

Mr. OBERSTAR. You both speak for the same time.

Ms. FRIEND. It comes to be expanded in what we fondly refer to as irregular operations where the schedule may be built within the correct parameters and circumstances arguably beyond the control of the operator prevent the aircraft from being put on the ground in the proper place within those time frames.

Our bigger problem is with the rest provisions that were part of that laborious and painful process that you described in that there is a provision in the rest to reduce the rest time down to eight hours. But it was intended to be on an exception basis to accommodate irregular operations whether it be weather or air traffic control delays, things that we really can't control which is now being used not as an exception to the rule but as regular scheduling practices. That is really the problem that we are having.

Mr. PRATER. You start to find that time is defined differently in the airline industry. Some of the practices are to flight plan, schedule a flight just below eight hours even though that flight couldn't, on its best day, be flown under eight hours as a way of not exceeding the need for two pilots. New York to Frankfort, that flight will go over eight hours day in and day out, but it is always scheduled for 7 hours and 55 minutes.

We see a few other practices like that that come to our attention. One of the most egregious is the scheduling of reserve crew members. We heard this morning from the FAA that personal responsibility for mitigating fatigue should be considered.

Well, let me tell you a practice of telling a pilot that he is going to go on duty at 4:00 a.m. in the morning. So he or she goes to sleep maybe at 8:00 the night before. At 4:00 a.m., they receive a call saying, oh, all of the morning flights are covered. You are now released to your nine hours of rest. Be ready to go back to work at 3:00 this afternoon and oh, by the way, we are going to schedule you for an 8:00 flight to London and you will be on duty for 15 hours.

This double use of crew members, you cannot prepare for those types of situations. That is why we need more regulatory efforts to control those types of situations.

Thank you.

Mr. OBERSTAR. Is that situation extant because there are not enough flight crews to call upon to manage the aircraft, that is, you don't have enough pilots?

Mr. PRATER. The pilot staffing has been cut to the bone just like many other employees, whether it is service, whether it is flight attendants, whether it is mechanics. We have seen that reduction of the force. While we have seen maybe fewer airplanes in the fleet, we see a lot fewer employees to service even more passengers.

So, yes, we are seeing trying to fly a full schedule with less pilots. That is forcing longer days, more hours in the work month, more hours in the year, and that is the effects of the last five years for what we are seeing.

The FARs do not adequately protect the traveling public from having a tired pilot, a tired flight attendant, a tired mechanic.

Mr. OBERSTAR. Ms. Friend, I think the same situation pertains in the flight attendant crewing of aircraft.

Ms. FRIEND. That is correct. It is a question of the employers' efforts to increase productivity, getting more work out of a fewer number of employees, and that was in response to their economic crisis.

Mr. OBERSTAR. Captain Prater, also as you said in your testimony, there is no limit on the number of times a month that lengthy duty days may be assigned. Do you think that we ought to amend the existing laws and impose limits?

Mr. PRATER. When we went through the exercise back in 1995 and 1996 and some of the proposals are still sitting, gathering dust on one of the FAA shelves, it was because the industry and the unions and the FAA couldn't agree.

Mr. OBERSTAR. That was before September 11th.

Mr. PRATER. That is correct, sir.

Mr. OBERSTAR. Yes, yes.

Mr. PRATER. We have asked and we have told the FAA that we were coming back because of our experience, the reports of those 60,000 pilots telling us. I am not telling them. They have been telling me: We have got to do something. We have lost the contractual rights. Therefore, if we can't move it through the FAA, we have to come to Congress and ask for assistance.

Mr. OBERSTAR. Your point, I think, is well stated. The issue is not whether to change the rules but how much to reduce the maximum flight and duty times. If that means that airlines have to hire more crew, then they ought to be doing it in the interest of safety or the time will come when people say it isn't safe to fly.

Mr. PRATER. We will do everything in our power to make sure that day doesn't come.

Mr. OBERSTAR. We heard from NTSB and also from FAA about technology, the runway status lights system. This FAA is so full of acronyms. I just hate to use them. I spell them out for my own benefit as well as for others I am talking to.

ASDE-X and a final runway approach signal, what is your reaction to the effectiveness of that technology giving pilots information in the flight deck about the situation on the ground?

Mr. PRATER. We are certainly not averse to new technological approaches to solving problems, but we think sometimes the concentration ought to be on the more basic, back to the basics approach, whether it is better lighting systems on the ground, stop signals to prevent a runway from being crossed while it is being used by an approach.

Yes, technology can help. The systems that have evolved over the years have provided us with much better separation from midair collisions, and it can be done with the ground control.

But we see some of the most basic things like making sure there is enough controllers in the cab to make sure a runway is clear before crossing us, to make sure that someone is responsible for one runway approach instead of two, three or four crossings downfield. In low visibility situations, the technology helps greatly.

One of the best things we can all do sometimes, even though aviation is supposed to be fast, is to slow down, is to not push the airplanes right to their limits, not to push the maximums. Hitting,

if you will, the final approach marker four or five miles from touchdown at speeds where you have to do everything you can to slow down to make that landing. Those are all techniques used by the industry, by the FAA to try to mandate, to get as much capacity into the system.

We believe a few more controllers in the tower would be a good thing especially if they are rested controllers.

Mr. OBERSTAR. I couldn't agree with you more on that score because as we all have learned over the years, on final, it is not how much runway is behind you but how much runway is left ahead of you.

Mr. Chairman, you, I am sure, have questions and Mr. Petri as well. I will withhold at this point.

Mr. COSTELLO. Mr. Petri, do you have further questions?

Mr. PETRI. I would like to thank the panel.

Mr. COSTELLO. Actually, Mr. Chairman, I think that we have covered a lot of the issues.

I do have some comments that I want to make. But before I do, let me say that our colleague from Kentucky, Ben Chandler, submitted written questions not only for the first panel but for you as well, and we will be getting those to you for a written response to Mr. Chandler.

I said to the first panel and will say to you that this will not be the last hearing that we will hold concerning not only the NTSB's Most Wanted List but other safety issues. I believe it is our responsibility, this Subcommittee's responsibility to make certain that we hold the FAA and other agencies that we have jurisdiction over accountable.

I believe that while we have made some progress in certain areas, it has taken far too long as I think Ms. Dunham has pointed out in her written testimony.

Ms. DUNHAM. May I say something?

Mr. COSTELLO. She looks like she wants to jump in right now, so I am going to recognize you in just one second.

But it has taken far too long. It is our responsibility to make certain that the FAA takes action, and when they do not, we need to hold them accountable. I want to assure you, as I did the FAA, that if they think is going to be the last hearing and they can get by today and go back to business as usual, that is not going to happen.

Ms. Dunham?

Ms. DUNHAM. I am glad to hear that.

I think the purpose of the hearing was to discuss these six NTSB recommendations. Collectively, these have been studied for about 150 years. I totaled it up. We are concerned about moving action forward, and we are asking Congress for your help. When the technology is there, when the money is there, the safety initiatives should move forward.

One good example right back where we started, the most important tool in an air crash investigation is the black box. We are recommending upgraded recorders. The FAA has delayed upgraded black boxes for decades.

We are requesting that Congress respond with legislation that would mandate dual flight data recorders for the front and the rear

and a deployable recorder in the rear to ensure that the black box survives and have a rapid response for the cause of the disaster. The military has had deployable recorders for years. This would benefit everyone with the state of the art technology.

You don't know the cause of the next aviation disaster. There will be suspect about terrorism. It is most important that we get this basic technology forward, and we are asking you for help.

Flying is safe. Millions of people get where they are going every day, but we still average over one fatal crash a day in the United States. We shouldn't have aviation disasters as the only way to get people's attention.

Thank you so much for saying that this isn't the last hearing.

Mr. COSTELLO. Well, thank you for your participation and all that you have done with the families that have been involved in your organization.

Let me ask the other members of the panel if they have some final thoughts or comments before we go to a final round of questions and close the hearing.

Mr. Voss?

Mr. VOSS. Thank you, Mr. Chairman.

I think my only comment would be that it is important for us not just to pay attention to the accidents because there are very few accidents now.

We are doing a great job looking forward. Safety management systems were mentioned repeatedly, FOQUA and ASAP systems also. Recording systems were mentioned repeatedly. I think that we are at a new age now where we need to be focusing on those proactive measures. I think there has been a strong consensus on the panel that they are all very important, and I would like to see more emphasis on that in the future.

Thank you.

Mr. COSTELLO. Captain Prater?

Mr. PRATER. Yes, sir, I would like to roll right in on the SMS. We have seen safety management systems evolve through the government in Canada. We have done everything we can to protect the ASAP and FOQUA systems and develop those so that it can be a confidential way to report on yourself, to report what you see, even from the ramp driver, tug driver that might accidently hit an airplane. If he or she recognizes that and turns himself in, we might prevent an incident or even an accident.

We have to develop those systems in the United States from the top down, from the CEOs right down to whatever employee is near an airplane. If they will do that, we are ready to move on those. But, again, I fear it will take a push by Congress to get the airline industry to fully adopt the SMS systems.

Thank you.

Mr. COSTELLO. Ms. Friend?

Ms. FRIEND. I would just thank you again, Chairman Costello, for your interest in our industry. We can use all the help we can get.

Mr. COSTELLO. Mr. Coyne?

Mr. COYNE. I would like to thank you all. Mr. Chairman, I have appreciated your help and friendship, all the Members of the Committee over many years, and I am very happy to be here.

I would like to just second one of the things that Mr. Voss said earlier, though, which is really important. The number of accidents is going down. The era, the 20th Century was a time when we could promote safety perhaps by just investigating the accidents.

We really need a much more diagnostic environment now where we look at problems long before they are accidents, and that is why I think the safety management system process is so important because that is the only way for us to get the data we need. Of course, once we have the data, we can figure out what we need to do. The worst way to get data to create aviation safety is to get the data from an accident.

Hopefully, with your help and others, we can get to a world where we never again have to wait for that accident to get the data we need.

Mr. COSTELLO. Chairman Oberstar?

Mr. OBERSTAR. Thank you, Mr. Chairman.

I thank the panel for their comments.

In the spirit of safety which is aimed at preempting the next accident, Mr. Voss, I would like to ask you and Captain Prater whether you are noticing an increase in the number of minimum equipment list incidents aboard aircraft in this era of fewer aircraft, more pressure on existing aircraft to be flying more hours of the day and more outsourcing of maintenance.

Are there more MELs?

Mr. VOSS. Thank you, but I think I would have to defer to Captain Prater on that one, and I am certainly interested in hearing the response to that question.

Mr. PRATER. Well, I hate to pass the buck, but what I will tell you is that I think it is a question that needs to be investigated.

I can say that at the first rate operators, no, there has not been. They have been keeping the airplanes in the sky, and they have been keeping the maintenance going when the airplanes are on the ground. However, we have seen a tremendous economic pressure on some operators, and there is always at that point a concern about whether something gets fixed when it is noticed or is it put off for 24 or 72 hours.

What I can commit is that we will survey all of our operators, all of our pilots to see if there is an increase. I believe that most of our operators are doing a good job in keeping the airplanes maintained.

Mr. OBERSTAR. Ms. Friend, do you have a comment on that? No.

Just for the record, a minimum equipment list is that equipment that is inoperative or non-functioning which is not essential to safety of flight. It means you can operate the aircraft, but you need to have a public announcement system and you can't fly it more than 24 hours without.

What I have learned over the years is that there is a progression from MELs to major failures. I am very concerned about this, and I have asked the FAA to do a search of records and provide me with a report that I will share with Mr. Costello and Mr. Petri when we get that information on whether there is a progression of MELs.

I just, in random flying, notice an increase. Thank you.

Mr. COSTELLO. I thank the Chairman.

We thank all of you for your thoughtful testimony. We look forward to continuing to work with you on these important issues. Thank you.

The Subcommittee is now adjourned.

[Whereupon, at 1:00 p.m., the Subcommittee was adjourned.]

STATEMENT OF
THE HONORABLE JERRY F. COSTELLO
SUBCOMMITTEE ON AVIATION
HEARING ON
THE NATIONAL TRANSPORTATION SAFETY BOARD'S MOST WANTED AVIATION SAFETY INPROVEMENTS
JUNE 6, 2007

- I want to welcome everyone to this hearing on the *National Transportation Safety Board's Most Wanted Aviation Safety Improvements.*

- I have said time and again that although the United States has the safest air transportation system in the world, we cannot rely on or be satisified with our past success. We must continue to strive for greater success, because one accident or near accident is one too many.

- The National Transportation Safety Board (NTSB) has been investigating accidents and proposing remedies to avoid them

since it was founded in 1967. With an overall recommendation acceptance rate of approximately 82 percent by the FAA, important changes and procedures have been made to improve the safety of the traveling public.

- Since 1990, the NTSB has kept a Most Wanted List, representing the most serious problems facing the transportation industry. There continues to be significant challenges in aviation safety.

- The NTSB's Most Wanted List has six issue areas for aviation – five of which received an "unacceptable response." I am not impressed by this statistic, and remain disappointed and concerned that many of these issue areas have been on the list for five, ten or even 15+ years.

- For example, runway incursions has been on the Most Wanted List since it began in 1990. While new technologies have come online and are slowly being deployed to our airports, serious incursions continue to occur.

- An incident as recently as January 5, 2007 at Denver International Airport, where the NTSB states that two airplanes missed colliding by about 50 feet, remind us of the importance of runway safety.

- Further, both the Government Accountability Office (GAO) and the Department of Transportation Inspector General's Office (IG) have also highlighted runway incursions as a safety concern; yet, this issue still remains on the Most Wanted List.

- I am interested in hearing from both the NTSB and the FAA why these six issue areas remain on the Most Wanted List; what, if any, progress is being made; and when we can expect to see significant improvement in these issue areas.

- I am also interested in hearing more about fatigue. Fatigue is an issue that affects all modes of transportation. Aviation is a 24 hour 7 day a week business, with demanding work schedules. We must do more to ensure that all aviation safety professionals are adequately rested and are alert to perform their duties.

- Finally, I would like to point out that Gail Dunham, executive director of the National Disaster Alliance/Foundation, is with us today. She represents family members that have lost

loved ones in aviation accidents. Gail and her group know firsthand the pain that results when our aviation system is not performing at the highest level of safety possible. She reminds us all that we must demand the highest standards of aviation safety.

- We must work together to ensure that we continue asking the tough questions and issue the even tougher and sometimes costly rules to guarantee the highest level of safety for the traveling public. With that, I want to again welcome our witnesses today and I look forward to their testimony.

- **Before I recognize Mr. Petri for his opening statement, I ask unanimous consent to allow 2 weeks for all Members to revise and extend their remarks and to permit the submission of additional statements and**

materials by Members and witnesses. Without objection, so ordered.

MAZIE K. HIRONO
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Statement of
Congresswoman Mazie K. Hirono
House Committee on Transportation and Infrastructure
Subcommittee on Aviation

June 6, 2007 Mazie K Hirono

Mr. Chairman, as are other members of this committee, I am deeply concerned about travel safety, and a fundamental problem that is involved in all modes of transportation is operator, controller or pilot fatigue.

Based on current known studies on work cycles, sleep, and circadian rhythms (the 24 hour biological clock), current fitness-for-duty rules are inadequate. Scientific studies have shown that fitness-for-duty should consider, for example, all periods of work and sleep for several days preceding the duty as well as the amount and type of transmeridian (east-west or west-east) travel, particularly of pilots flying cross-county.

Industry and various research centers are working with leading fatigue management researchers to develop solutions for the management of operator fatigue in all forms of transportation including specifically aviation.

Together with several leading researchers in the field, Archinoetics, a Hawaii-based company, incidentally owned by a woman, has developed and are working with software tools like the Schedule Fatigue Risk Management (SFRM) tool. SFRM uses validated scientific models of cognitive impairments to rapidly assess work schedules.

The same Hawaii company has developed monitors that directly tie-in to the SFRM making it possible to accurately measure and record fatigue and other bodily functions. It is important to note that both the SFRM and monitors are not specific to pilots; they can be used with operators, crew, and controllers and for other modes of transportation, including truck drivers and train crews.

It can identify those operators that are overly fatiguing and therefore pose an excess risk for operator-related errors. Some of this technology is currently being used by both small and large commercial fleet operators, and also with aviation union representatives.

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I submitted an authorization request for another device to monitor precise cognitive and physiologic functioning on warfighters operating in the stress of combat. Archinoetics is also the developer of that important technology that will help save lives and improve the capabilities of our troops. The authorization request was recently approved by the Armed Services Committee and will hopefully be approved by the full House.

The safety of our traveling public must be protected with every means possible, including application of new technologies. We must ensure that the most current and promising methodologies and tools, particularly in the area of fatigue management, are being implemented.

1

Statement of Rep. Harry Mitchell
House Transportation and Infrastructure Committee
Subcommittee on Aviation
6/6/07

--Thank you Mr. Chairman.

--Over the past few months, we have explored numerous issues relating to the reauthorization of the Federal Aviation Administration ("FAA").

--In so doing, we have made clear that safety is our top priority.

2

--Today we will hear from the National Transportation Safety Board ("NTSB") about the priorities they think the Federal Aviation Administration needs to have, in order to prevent future accidents.

--Of these, I am particularly we concerned about runway incursions and what we can do to reduce them.

--Over the last decade, Phoenix Sky Harbor has witnessed no less than 69 incursions, including 6 which were considered serious.

3

According to Forbes Magazine, this is a key reason they now consider Sky Harbor America's 4th most dangerous airport.

--And we are facing this issue at a time when, according to the FAA, 70 percent of our air traffic controllers are going to become eligible to retire over the next 10 years.

--Clearly need to make sure the FAA has the resources to keep the flying public safe….both in the air, as well as on the ground.

4

--I look forward to hearing from today's witnesses.

--I yield back the balance of my time.

OPENING STATEMENT OF
HONORABLE JAMES L. OBERSTAR
BEFORE THE HOUSE AVIATION SUBCOMMITTEE
THE NATIONAL TRANSPORTATION SAFETY BOARD'S
MOST WANTED AVIATION SAFETY IMPROVEMENTS
JUNE 6, 2007

- I want to thank Chairman Costello and Ranking Member Petri for calling today's hearing on *The National Transportation Safety Board's Most Wanted Aviation Safety Improvements.*

- The National Transportation Safety Board's (NTSB) roots stem as far back as 1926 when the Air Commerce Act vested the Department of Commerce with the authority to investigative aircraft accidents. During the 1966 consolidation of transportation agencies into the Department of Transportation (DOT), the NTSB was created as an independent agency within DOT to investigate accidents in all transportation modes.

- In 1974, the NTSB continued to retain its independence when Congress re-established the NTSB as a separate entity distinct from DOT. Since that time, the NTSB has investigated almost 130,000 aviation accidents. The NTSB's tireless efforts in investigating accidents and issuing recommendations have led to innovative safety enhancements, such as manual cutoff switches for airbags, measures to prevent runway incursions, and countermeasures against operator fatigue in all modes of transportation. The American traveling public is much safer today due to the hard work of the NTSB staff in conducting investigations and pursuing safety recommendations.

- In 1990, the NTSB first issued its Most Wanted Safety Improvements. Unfortunately, human fatigue and airport runway incursions were on the list in 1990 and they are still on the list in 2007. The 2007 NTSB's Most Wanted aviation safety improvements also includes aircraft icing, fuel tank flammability, improved audio and data recorders, and part 135 crew resource management.

- The fact that six of the fourteen NTSB Most Wanted safety improvements are aviation-related is troublesome given that the Federal Aviation Administration (FAA) predicts one billon U.S. passengers by 2015. The U.S. cannot afford to be anything less than vigilant with regard to the flying publics' safety. We owe it to the families of the victims of previous accidents, many of whom are represented here today by the National Air Disaster Alliance/Foundation. We

must learn from their loss, so that other families do not lose loved ones from similar accidents in the future.

- One of the most critical issues facing all flight crew today is fatigue, especially with increased fuel costs and the air carrier's emphasis on increasing productivity and driving down labor costs. We need to be mindful of this important issue as it pertains to all aviation professionals, from pilots to controllers, to flight attendants and mechanics. Working long hours on an irregular schedule can have a destructive effect on decision-making abilities.

- Vince Lombardi was well known for his comment "Fatigue makes cowards of us all." What he meant was it weakens all of your senses, all of your reaction times, all of your ability to perform at the highest level. As I have repeatedly said: Fatigue does not show up in autopsies! Our nation's aviation professionals must be provided adequate rest to perform their critical safety functions. Anything less is simply not acceptable!

- Seventeen years ago, the NTSB called upon the Department of Transportation (DOT) – including the FAA – to review its current hours-of-service regulatory schemes to ensure that the latest scientific research on fatigue and research had been incorporated. Progress on FAA's proposed 1995 overhaul to its flight and duty regulations for pilots has essentially stopped under the Bush Administration.

- More recently, on April 10, 2007, the NTSB issued two recommendations to the FAA to work with the controllers union to revise controller work-scheduling policies to provide for adequate rest periods, and to develop fatigue awareness and countermeasures training program for controllers and controller-schedulers.

- Having well-rested aviation personnel is critical to aviation safety. It is time to refocus our efforts and press the FAA to resolve these very significant and complex fatigue issues. I look forward to hearing more about the FAA's plans on this important issue.

- Chairman Costello, thank you again for having this hearing. We have a well-trained NTSB workforce protecting the American traveling public by making safety recommendations. But without implementing their recommendations we only have the warning and not the protection the traveling public deserves.

Opening Statement
Congressman John T. Salazar
T&I Aviation Subcommittee Hearing
Hearing on the NTSB's Most Wanted Aviation Safety Improvements
June 6, 2007

Thank you, Mr. Chairman.

And thank you for holding this hearing on the NTSB's Most Wanted Safety Improvements for Aviation.

A couple of the issues on their list—*Fatigue* and *Crew Resource Management (CRM) Training for Part 135 Flights*— had been brought to my attention by St. Mary's CareFlight, operating out of St. Mary's Hospital and Medical Center in Grand Junction, CO.

The CareFlight program has expressed specific safety concerns within the air medical transport community.

A great majority of air medical crashes over the past 5-7 years have been conducted under FAR Part 91 rules.

As you know, Part 91 allows for much less stringent weather minimums and does not restrict pilot duty time in comparison to Part 135.

Yet Part 135 is currently only required to be used when a patient or an organ is on-board.

This makes no sense to me.

The lives of our pilots and air medical crews should be protected by the same weather minimums and pilot duty-time requirements that these patients are afforded during their leg of the transport.

So my question to the FAA is why are you taking so long to decide?

I am curious to know the FAA's position on this issue—Part 91 versus Part 135.

A second safety issue I want to mention is weather reporting.

One of the leading factors of accidents in Colorado is weather.

I believe that if we could improve the information our pilots receive on weather, it would benefit everyone—especially the NTSB and the FAA.

I realize this is not on the NTSB's list, but I think it's a point worth making.

I look forward to the testimony today and I thank the panel members for being here.

Thank you.

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NATA
National Air Transportation Association

Statement

of the

National Air Transportation Association

before the

Subcommittee on Aviation,

Committee on Transportation and Infrastructure,

U.S. House of Representatives:

Hearing on

The National Transportation Safety Board's

Most Wanted Aviation Safety Improvements

June 6, 2007

2167 Rayburn House Office Building
Washington, DC

Appearing for NATA:
James K. Coyne, President

Chairman Costello, Ranking Member Petri, and Members of the Subcommittee:

Thank you for this opportunity to appear before you to discuss the National Transportation Safety Board's (NTSB) Most Wanted Aviation Safety Improvements. My name is James K. Coyne, and since 1994, I have served as president of the National Air Transportation Association (NATA). NATA, the voice of aviation business, is the public policy group representing the interests of aviation businesses before the Congress, federal agencies and state governments. NATA's over 2,000 member companies own, operate and service aircraft and provide for the needs of the traveling public by offering services and products to aircraft operators and others such as fuel sales, aircraft maintenance, parts sales, storage, rental, airline servicing, flight training, Part 135 on-demand air charter, fractional aircraft program management and scheduled commuter operations in smaller aircraft. NATA members are a vital link in the aviation industry providing services to the general public, airlines, general aviation and the military.

I am also pleased to be testifying alongside a good friend and colleague of mine, Bill Voss, President and CEO of the Flight Safety Foundation. The work of the Flight Safety Foundation, of which I currently serve on the Board of Governors, has led to dramatic improvements in aviation safety over the last half-century in both the commercial and general aviation sector of our industry. I believe that this unprecedented period of aviation safety in which we currently live is directly attributable to the collaborative efforts of the organizations like the Flight Safety Foundation, working side-by-side with industry experts and government leaders to implement operational and technological changes that have improved the lives of all Americans who rely on safe and efficient air transportation.

During my tenure at NATA, I have made it a priority for the association to develop strong relationships with NTSB Board Members and staff, to foster an ongoing dialogue that will prove beneficial to both organizations. I have met personally with every member of the Board to discuss NATA's safety initiatives and have been impressed with the direction the Board is moving in several areas. Today's hearing provides an excellent opportunity to review, comprehensively, many of these important issues facing our industry, and to hear from both the NTSB and the FAA regarding their efforts to address these concerns. NATA looks forward to working with both agencies to provide advice on how we can best meet these critical goals.

NTSB Most Wanted Aviation Safety Recommendations

Five of the National Transportation Safety Board's top 6 "most wanted" aviation safety improvements currently bear an "unacceptable" response from the FAA. My testimony will discuss those 5 areas deemed unacceptable by the NTSB, and will describe actions taken by NATA and the aviation industry as a whole to alleviate many of the concerns voiced by the Board. In many cases, the Subcommittee will discover that the industry is well ahead of the FAA and other government agencies in implementing operational and technological changes that will address these concerns. Overall, NATA is generally supportive of the recommendations made by the NTSB in these five areas, but has concerns with the application of some of the NTSB proposals, particularly regarding the difficulty of retrofitting existing aircraft to comply with some of the suggested changes.

Specifically, NATA supports the recommendations made by the NTSB in regard to the dangers posed by known icing conditions, as well as recommendations to increase requirements for cockpit voice and data recorders, and extend the duration of time recorded by this equipment. However, any FAA rules requiring technological improvements should remain forward-fitting and not apply to existing aircraft, as such upgrades will disproportionately affect small general aviation aircraft. NATA agrees with the recommendations regarding runway safety and believes the NTSB and FAA are focusing the correct amount of attention the issue's top concern: runways at large commercial airports. NATA

also contends that the best approach to runway safety must include human factors interventions to complement any technological improvements. NATA provides such human factors training to the industry on an ongoing basis through our Safety 1st Program and other events.

NATA is also supportive of the NTSB decision to include revised pilot work-hour regulations and crew resource management training as part of its most wanted list. The association has participated in drafting comprehensive proposals submitted to the FAA that would address, and even exceed, the recommendations made by the NTSB in these areas. We are hopeful that in both cases, the FAA acts quickly on these recommendations and initiates rulemaking to address these concerns.

Reduce Dangers to Aircraft Flying in Icing Conditions

The NTSB has recommended that the FAA "use current research on freezing rain and large water droplets to revise the way aircraft are designed and approved for flight in icing conditions." The Board has also suggested the FAA work with NASA to "identify realistic accumulations and incorporate new information into aircraft certification and pilot training requirements."

On April 26, 2007, the FAA issued a notice of proposed rulemaking (NPRM), changing requirements for ice protections on newly certificated aircraft. The proposal, a direct response to previous NTSB recommendations, requires the establishment of a system to ensure timely activation of airframe ice protections for all aircraft certificated for flight in "known icing conditions." Furthermore, the NPRM would require an aircraft to be equipped with a primary ice detection system, typically consisting of two independent detectors, which either automatically activates the icing protection system or provides an indication to the flightcrew when the system must be activated manually. The NPRM would also mandate that newly certificated aircraft be equipped with an advisory ice detection system that would alert the flight crews to certain visual cues consistent with the accumulation of ice during known icing conditions.

NATA is supportive of the NTSB's recommendation to improve the research and development of aircraft systems to more accurately recognize and respond to icing conditions and is supportive of the FAA's rulemaking in this regard. However, NATA does remain concerned with efforts to significantly modify existing aircraft systems, particularly in aircraft that have successfully completed millions of safe flight hours with their current certificated systems. Additional icing system requirements, such as those suggested by the NTSB, should remain forward-fitting and should not be required on the existing fleet if changes are ultimately deemed appropriate after proper analyses occur.

It is also important to note that many of the accidents involving icing result from incorrect crewmember actions that may - in some cases - even be contrary to existing FAA regulations. When dealing with human factors in known icing conditions, education and training are the absolute best methods for reducing the dangers caused by icy conditions. While technology improvements will undoubtedly improve the safety of aircraft flying in known icing conditions, the best defense against such accidents begins with proper icing avoidance, and icing detection/protection systems and anti-complacency training.

The proper use of anti- and de-icing procedures on the ground is also critical to safe winter operations. NATA routinely offers to the industry comprehensive seminars to train those responsible for ground anti- and de-icing applications on the proper techniques to ensure ongoing competence.

Reduce Runway Incursion/Ground Collisions of Aircraft

The NTSB has proposed that the FAA require the installation of systems aboard aircraft that would "give immediate warnings of probable collisions/incursions directly to flight crews in the cockpit." While this recommendation was made following accidents involving large commercial aircraft and commercial service airports, NATA recognizes that ground safety on the airport operating area is the responsibility of employees at all levels of service on an airport.

As the Subcommittee is well aware, the FAA has taken a number of positive steps to improve runway safety, and has made the issue a top safety priority within the agency. The agency has established a runway safety web site, and allows pilots and maintenance technicians to disclose runway incursions with no punitive legal enforcement. By removing such punitive enforcement, the FAA has created an environment where stakeholders can learn from previous incidents and discuss ways to correct many of the root causes of these incursions. The FAA has set a goal of reducing the most serious incursions to .450 per one million operations by fiscal year 2010.

The FAA is also currently testing and implementing a number of runway safety initiatives, including installing Airport Surface Detection Equipment -- Model X (ASDE-X) warning systems at 17 major airports, with seven more planned for fiscal year 2007. These systems, currently at various phases of implementation, with 8 fully functional, are a vital component to increasing runway safety, as they provide air traffic controllers with detailed movement on runways and taxiways, even during periods of limited visibility. The FAA is also testing runway status lights (RWSL) at Dallas - Fort Worth International Airport (DFW), which could help reduce instances of inadvertent crossing of airport runways by other aircraft. RWSL essentially act as motion detectors, and blink red when there is movement too close to the light. The system is relatively inexpensive to install ($1 million per runway) and can work with existing ASDE-X systems. The agency is also working on enhanced marking for airport taxiways and runways which will more clearly identify proper positions for aircraft. The new markings are now standard at airports with 1.5 million or more passenger enplanements and are recommended for implementation at all airports by 2008.

NATA is in agreement with both the NTSB and the FAA regarding the technologies currently in testing and implementation stages to improve aircraft runway safety. It is important to note, however, that such systems are generally geared towards large aircraft operating at larger commercial service airports used by scheduled airlines. NATA concurs that these operators are the correct focus for the proposed technological solutions, but cautions that these improvements are not a panacea to solving all runway incursion incidents. A sustainable reduction in runway incidents must involve not only warnings of an imminent problem, but also include early intervention and analysis of the root cause of these incursions, particularly when such incursions involve ground support equipment. Reducing human errors that lead to these incursions will have a profound impact at all airports, including the smallest general aviation airports.

NATA has undertaken numerous initiatives to prevent runway incursions and ground collisions of aircraft. As part of our Safety 1st program and Safety Management System programs, which is described below in greater detail, ground safety is a top priority within our organization. We regularly conduct Professional Line Service Training (PLST) educational courses for ground service employees, which helps promote, establish, and maintain a safe ramp and working environment. The course reduces costly accidents through the use of safe and uniform procedures, and is the only program in our industry that is aircraft-specific. NATA has also, under a grant from the FAA, produced a video on ramp communications directed at flight crews and ground personnel to reduce these kinds of incidents and accidents. Our training is ongoing, as the Safety 1st program conducts

monthly online web casts focusing on a variety of safety issues, in addition to a monthly newsletter for ground operators, focusing on runway safety.

Improve Audio and Data Recorders/Require Video Recorders

In recent years, the NTSB has been adamant in their support of increased use of cockpit voice recorders (CVRs) and flight data recorders (FDRs), and the Board has also suggested the use of video recorders in the cockpit to give investigators more information when studying an aircraft accident. The Board has proposed requiring CVRs to retain at least two hours of audio, and requiring backup power sources on CVRs to collect an additional 10 minutes of data should an aircraft's main power fail. The Board has also suggested annual inspection requirements of these devices to ensure their integrity.

Currently, FAA regulations require the use of cockpit voice recorders in multi engine, turbine-powered Part 135 aircraft with six or more seats and certificated for two pilots. Furthermore, any turbine-powered aircraft with 20 or more seats, regardless whether the flight is considered commercial or noncommercial, is required to have a CVR. Part 135 flights (commercial) are required to have 30 minutes of recording, while Part 91 (noncommercial) flights have a 15-minute requirement, both of which are on continuous loops. Additionally, multi-engine turbine-powered Part 135 aircraft with 10 or more seats are required to have a FDR on board.

The FAA has proposed a rule to boost the CVR retention to 2 hours of audio, for both current and future aircraft. The same proposed rule also seeks to require backup power on CVRs only for newly manufactured aircraft. There is currently no rulemaking in progress to require cockpit video recorders.

NATA is supportive of expanded requirements for cockpit voice and data recorders, on the condition that such requirements are forward-fitting and do not apply to existing aircraft. Any new mandate should follow the Part 135 regulations as currently written: multi-engine, turbine-powered with 6 or more seats certificated for two pilots are required to have a CVR, and multi-engine, turbine-powered with 10 or more seats certificated for two pilots are required to be equipped with an FDR. Retrofitting the existing fleet can be an extremely complicated and expensive process, and we believe such a requirement would place an unnecessary and costly burden on the industry. It is also very likely that the FAA technical approval for installations of such equipment would require a Supplemental Type Certificate (STC) on a per-aircraft basis, which would dramatically increase the time and cost burden needed to comply with such a requirement.

NATA also remains very concerned with the concept of cockpit video recorders. There have been some studies evaluating the usefulness of this equipment in airliner aircraft, but here has been no effort to determine the benefit of these devices in the smaller cockpits of general aviation aircraft. Manufacturers of this equipment have stated that multiple cameras would probably be necessary to capture all the viewing angles due to the extremely tight quarters of a general aviation aircraft, significantly raising the costs of acquisition and installation. These evaluation studies have also indicated that the video recorder is most effective when coupled with voice and data recorders that are not required in all aircraft. Ultimately, the interpretation of a video recording, without accompanying voice and data information, is highly subjective and could lead to additional confusion if used as a stand-alone device.

In the area of flight data information collection, I would strongly encourage the NTSB and the FAA to think "outside the box" by considering alternative technologies that are both lower in cost and easier to implement than traditional voice and data recorders. For example, there is a GPS-based

solution that could monitor various flight parameters and provide the NTSB with volumes of data in the event of an accident. Many of today's new general aviation aircraft are equipped with highly advanced avionics, including GPS, primary flight displays and multi-functional flight displays. This equipment could be manufactured to include crash-hardened computer memory chips that would contain information from these electronic sources. It is possible that these chips could be programmed to record many of the same elements captured by flight data recorders, at a significantly reduced cost. Should the FAA ultimately determine that additional regulations requiring data recording devices are necessary, NATA strongly recommends that lower-cost alternative technologies be considered.

Reduce Accidents and Incidents Caused by Human Fatigue

The NTSB has recommended that the FAA revise its current pilot duty and rest requirements, establishing new working hour limits for flight crews and aviation mechanics based on human fatigue research studies, circadian rhythms, and sleep and rest requirements. NATA generally agrees with the NTSB's recommendations and has led an initiative to reform these regulations for flight crewmembers in the on-demand air charter industry.

The current regulations for Part 135 crewmember flight, duty and rest requirements are widely misunderstood, subject to hundreds of interpretations and no longer reflect the operations of today's on-demand air charter industry. NATA has worked for over a decade on various proposals that would modernize these regulations. However, a key obstacle in this effort has been the desire by some, including some within the FAA, to impose a "one size fits all" standard on flight duty and rest requirements. The reality is that different types of operations impose different demands and stresses on pilots and therefore impact the onset of fatigue differently.

NATA served as an active participant on an Aviation Rulemaking Committee (ARC) regarding the Part 135 industry, which considered a number of much-needed reforms to the Part 135 industry. One of the key components of the 135 ARC's work was to draft and submit a proposal that would dramatically revise the flight, duty and rest requirements for Part 135 operators. The proposal addresses all of the major areas of concern voiced by the NTSB. It includes a hard limit on a pilot's duty-day, establishes predictable duty/rest (or wake/sleep) patterns, sets special rules for managing long duration flights that cross multiple time zones, and requires a minimum rest assignment of no less than 10 hours. Currently, commercial airline requirements only require an 8-hour rest limit, and that limit can even be reduced to 6 hours under certain conditions. The regulations endorsed by NATA do not allow a reduction in a pilot rest assignment for any reason. The 135 ARC proposal was a significant undertaking and we strongly urge the FAA to move forward on issuing the recommendation as a proposed rule for public comment. NATA would also be happy to provide an in-depth briefing for the Subcommittee on the specifics of the proposal.

Improve Crew Resource Management

The NTSB has recommended that Part 135 air charter flight crews, excluding those aircraft certified for only one pilot, receive crew resource management (CRM) training. NATA is in complete agreement with this recommendation. Importantly, the Subcommittee should be aware that the overwhelming majority of Part 135 flight crewmembers have already voluntarily implemented CRM training programs. The industry understands the need for CRM and its adoption of CRM programs has far outpaced the FAA's ability to initiate rulemaking in this area. The need for CRM training in Part 135 operations was another issue considered by the 135 ARC, which issued the pilot fatigue recommendations described earlier. The industry recommendation adopted by the ARC and submitted to the FAA actually exceeds the NTSB recommendations. Under the ARC proposal, all

Part 135 flight crewmembers would be required to receive CRM training, including those serving in single-pilot operations.

CRM training provides a pilot with far more than the ability to better communicate and work with other pilots. It equips the pilot with the skills to manage operating a complex aircraft with today's advanced avionics. This is especially important when considering the number of new very light jets, which will be certificated for single-pilot operations, entering the market place over the next few years. NATA applauds the NTSB for making CRM training a most wanted issue, and strongly urges the FAA to act on the recommendations of the 135 ARC in this area.

NATA Safety Initiatives and the Safety 1st Program

NATA and our members have made aviation safety a top priority, as you can see from our actions related to the NTSB's top aviation safety concerns. Because of the strong demand within our membership for improved safety training and evaluation, NATA formed the Safety 1st ® program in 1999, with a goal of reducing accidents on airport runways and taxiways by 50 percent. Through the program, participating companies receive training for their employees at all levels regarding industry best practices for handling ground support equipment. Over 500 companies participate in our Professional Line Service Training (PLST) program, which produce a wide variety of seminars and written material addressing key safety issues. The objective of the program is to teach ground personnel proper and safe procedures for servicing and refueling, towing and handling of general aviation aircraft and helicopters. Employees are trained to have a professional "safety first" attitude. The program has been an overwhelming success, with more than 8,000 line service technicians of NATA companies attending seminars and participating in safety training.

Building on the success of the Safety 1st program, in 2004, NATA embarked on an even stronger approach to aviation safety, through the concept of a Safety Management System (SMS). SMS programs incorporate a top-down approach to safety. Much like a company's cost-accounting system or quality assurance program, a SMS integrates safety training at all levels of an aviation business, from the company's executives to administrative support staff. The Safety Management System provides a complete safety management program specific to a company's operation. The SMS is based on recognized safety standards and is supported by rigorous industry data that will reduce or eliminate accidents and their resultant costs, in terms of lives lost, injuries sustained, insurance claims filed and direct financial losses incurred.

The NATA SMS consists of two basic components: development by the NATA SMS participant of a customized safety program based on industry best practices and procedures, and continual monitoring of risks, through collection and submission of incident and accident data for analysis. Our SMS for ground operations marks the first time in the industry's history that data regarding ground-based incidents can be collected and assessed to determine what standard procedures could be developed that would increase ground safety at all airports.

In 2005, NATA expanded its successful SMS program to include air charter operations. NATA's Safety 1st Management System for Air Operators is a systematic, comprehensive program for the management of safety risks. It integrates flight operations with financial and human resource management for all safety activities related to air charter. The program requires a stringent commitment from its participants to adhere to all guidelines of the program. The NATA SMS for Air Charter defines how operational safety should be managed and how it can be integrated into an organization's business activities. It ensures the safety message is consistent, interesting and always on the forefront of the SMS participant's corporate culture.

Since 2006, with support from an FAA grant, NATA has been able to expand this critical program much faster than originally expected. With the FAA pursuing rulemaking mandating that charter companies adopt a SMS program in the near future, this federal investment is already paying extraordinary dividends far ahead of any potential regulation.

NATA SMS is a data driven, business approach to safety management. In common with all other management systems, NATA SMS provides for goal setting, planning, and performance measurement. It concerns itself with organizational safety, which goes beyond conventional health and safety issues in a working environment.

Program participants receive a comprehensive safety guide, and agree to participate in an independent audit of their operational practices. Participants are also required to engage crews in both regulatory and refresher training designed to increase the flight crew's knowledge and continual learning.

The NATA Safety Management System instills a heightened safety culture throughout each participating company as the business embraces this safety program based on recognized industry standards and supported by rigorous industry data. NATA is working closely with the FAA to ensure that this program meets established guidelines and criteria.

The SMS program complements existing federal regulations, as compliance with federal regulations alone does not always result in the corporate safety culture and quality management goals that many operators wish to achieve. The NATA SMS can assist both air charter operators and ground-based service providers in raising the safety and quality bar that in turn will improve operational safety performance by lowering incident rates and identifying potential risks for accidents. NATA believes that the NATA SMS program will accomplish more to improve the safety of air charter operations and ground service providers than further regulatory burdens that do nothing to foster the necessary "corporate culture" essential to establishing a superior safety standard.

Conclusion

As you can see, NATA remains a strong advocate for increased aviation safety improvements, both through advances in technology as well as increased human awareness training. The recommendations of the NTSB in many ways mirror the efforts our industry is currently making to raise the bar for aviation safety. This Subcommittee's commitment to oversight of aviation safety is also a key component of the aviation safety puzzle, and we welcome any opportunity to discuss with you and your staff industry initiatives to continuously improve an already impeccable aviation safety record.

Thank you once again for the opportunity to testify, and I look forward to answering any questions Subcommittee members may have.

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Public Comments June 6, 2007

U.S. House of Representatives
Committee on Transportation
& Infrastructure

Re: NTSB "Most Wanted"
Aviation Safety Improvements

Mission: To raise the standard of Safety, Security and Survivability for aviation passengers and to Support victims' families.

Gail Dunham, Executive Director

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Who We Are . . .
The *NATIONAL AIR DISASTER ALLIANCE/FOUNDATION (NADA/F)* incorporated in 1995 and **we represent family members from hundreds of aviation disasters**. For over ten years *NADA/F* has brought people together in many ways to accomplish our shared goals—air crash survivors, those impacted by air disasters, family members that lost loved ones recently and long ago, and aviation professionals. We connect through the internet, annual and regional meetings, memorial events and more. *NADA/F's* diverse membership works with the media, the aviation industry, government officials, non-profit organizations, and others who share a similar purpose.

FAA ARAC - *NADA/F* has been a member organization of the FAA ARAC (Aviation Rulemaking Advisory Committee) since 1999, including a seat on the ExComm (Executive Committee).

TSA ASAC – *NADA/F* is also a member of TSA Aviation Security Advisory Committee.

Often *NADA/F* is the only voice representing the traveling public. We welcome the opportunity to work with government and industry to promote the highest standards of aviation safety.

I am retired from the airlines, and many of our members are airline/industry employees and retirees. We all want the industry to survive and prosper, and we honor our loved ones with our work for the highest standards of aviation safety and security.

My family lost a loved one over 15 years ago in a preventable aviation disaster. It took 7 years to receive the true probable cause of the 737 disaster, and 10 years to finally receive the NTSB Revised Final Report. I wish the NTSB had not blamed the wind in 1992, and had moved forward with the 737 retrofits, then I would not be here today. Safety and security have become my life's work.

We recognize that millions of people fly and get where they are going everyday. We are in an unprecedented long period of aviation safety, because hundreds of aging aircraft were retired after 9/11, and the engineering has come a long way. However, in the U.S. we still average over one fatal air crash a day. It may be general aviation, air cargo, the 21 souls on board USAirways Commuter 5481, or 49 souls on Delta/Comair 5191, and every one of those passengers has family and friends that miss them greatly. Family members also know that aviation crashes are preventable disasters, and we want the NTSB and FAA to do more so that others do not walk in our shoes.

Assume the following about Aviation . . .
- ✓ Commercial Aviation has become Public Transportation.
- ✓ An airline ticket is a contract for transportation, and the public wants to arrive safely at their destination.
- ✓ Safety could be the best corporate investment.
- ✓ The cost of safety is nil compared to the cost of an aviation disaster.
- ✓ The cost of preventing a mega-million aviation disaster can be as low as $9.99. (ValuJet cost of caps for the oxygen canisters).
- ✓ Lives of airline passengers are in the hands of the employees, who deserve fair pay and benefits, and adequate rest time to do their job.
- ✓ Aviation technology has improved greatly.
- ✓ Excellent aviation technology exists that is not being used, and it should be utilized sooner rather than later to promote safe, secure air transportation.

History of the NTSB Most Wanted Safety List . . .
NADA/F is true to our Founding Goals and the NTSB Most Wanted was a cornerstone of our Founding Goals since 1995. We used to receive an NTSB Most Wanted annual status report from the NTSB, including references to why the recommendations were made and actual progress on the recommendations. Today the NTSB Most Wanted for Aviation looks like a list of five or six bumper sticker slogans, and the six 2007 recommendations have been listed much too long.

Congress did not give the NTSB the power to mandate safety recommendations, probably because they knew the recommendations would be based on NTSB intensive air crash investigations, NTSB and industry working together, with strong merit for their conclusions and recommendations. The responsibility to mandate the Most Wanted rests with the FAA, and sadly the FAA has veto power over the recommendations, regardless of their merit.

Today's NTSB Most Wanted has 110 pages of power point and more colorful photos, but far less progress and less substance. From 2001 to 2006 power point charts were updated, but final Most Wanted safety recommendations are similar. It is not enough to report the data on a crash. The steps toward the NTSB Most Wanted recommendations are:

- ✓ Thorough investigations,
- ✓ Findings,
- ✓ Probable causes,
- ✓ Accurate probable cause,
- ✓ Technical studies with government and industry,
- ✓ Recommendations to fix the fatal flaws,
- ✓ Monitor the progress of those safety and security recommendations, and if the work is not done,
- ✓ **FAA mandate OR LEGISLATION to get the work done**.

In 2004 there was a major change in the Most Wanted List when the NTSB (Ellen Engleman-Connors) and FAA organized a SWAT team program, and many recommendations were just deleted.

In August **2005 the recommendation for mandatory child restraint seats for children under age two was deleted by the FAA and NTSB**. This was an outrageous deliberate mistake. The FAA at the Technical Center in NJ had completed the tests and had recommended a TSO in 2000. The excellent engineers worked through survivability and different types of child restraint seats to accommodate different aircraft and children's weight and size. Sadly, after 2001, the TSO recommendation languished on a bureaucrat desk and did not move forward.

There are excellent studies, investigations, reports and more, but now it seems the NTSB Most Wanted produces Press Releases with "feel good" resolutions, but fewer accomplishments.

The NTSB Most Wanted List began over 15 years ago, and the format has evolved the following ways:

- ✓ Summary of safety recommendations for all forms of transportation, to now listed individually by Aviation, Rail, Pipeline, Highway, Marine and Intermodal
- ✓ Specific recommendations such as "Aviation-Require Restraint Systems for Children under age 2" to very general recommendation such as "Improve Child Occupant Protection in vehicles and airplanes," and
- ✓ Most Important – from an annual detailed technical summary to decades old "sound bites."

NADA/F has watched the NTSB Most Wanted since 1997, and it appears that it has procedurally evolved from a technical engineering approach to fix the fatal flaws to power point one-liners. Science was and still is the answer.

The FAA MAC . . . One important change in the last ten years was the creation of the FAA MAC (Management Advisory Council), which is private meetings of aviation management with the FAA Administrator, and little to no public records of those meetings. The MAC appears less advisory and results imply it is a council with power over FAA personnel and dictates yes or no to much needed safety recommendations. This may be a Conflict of Interest because the traveling public is not represented on the FAA MAC. **If the FAA MAC is going to continue to be the powerful decision-maker than at least have their meetings open to the media and the public**.

Importance of the NTSB Most Wanted Safety List . . .
Required child restraint systems for children under age 2 . . ..
Attached GAO summary shows the need for required child restraint seats in flight for children under the age of 2 since 1972 (35 years ago). Child seats have been mandatory in cars for over 25 years. The FAA erred badly when they deleted required child safety seats from the NTSB Most Wanted in 2005. The FAA produced a brochure that the public knows nothing about, that states children under the age of two should be in a restraint. Individuals may purchase their own child safety seat for flying, but adults do not bring their own seats or seatbelts.

May 1995 - FAA produced a Report to Congress on Child Restraint Systems . . .
Major Flaw in the Report . . . For 12 years the FAA refers to one flawed conclusion in this report. The FAA states that if the airlines require that people purchase a seat for a child under the age of two that people will drive because it is less expensive. This is not true. People purchase airline seats for their children over the age of two. Airlines today also offer the infant ½ price reserved seats. With record airline capacity vacant seats are not there, and a lap baby can become a flying missile with turbulence or if a pilot needs to take an evasive maneuver.

MOST Important Fact . . . Babies died because they did not have the safety of a required child restraint seat. A baby on a commercial flight should never be less safe than the coffee pot! Our *NADA/F* members will meet you and other decision-makers to move this forward.

PLEASE. We need Congress to mandate Required Child Restraint devices for all children on commercial aircraft. This is mandatory on military flights and the traveling public deserves this same level of safety.

The SIX NTSB Aviation "Most Wanted" for 2007 . . .

1. Reduce Dangers in Icing Conditions – What has been done since AAEagle 4184, Halloween 1994? The Circuit City corporate crash February 2005 was another wake-up call that we need more than promises to "study freezing rain and large water droplets."

2. Eliminate Flammable Fuel/Air Vapor in Fuel Tanks - There are documents from over 25 years ago recognizing the need to prevent these disasters. Attached is a two page summary of *NADA/F* work to promote inerting, known technology to eliminate fuel tank explosions such as TWA 800. Inerting is lowering the oxygen content with nitrogen to prevent explosions. *NADA/F* was a member organization of the second FTIHWG (Fuel Tank Inerting Harmonization Working Group) in year 2000, and the only organization to Dissent. We stated that it was not "too expensive" to fix, and the excellent staff at the FAA technical center in New Jersey, working with Boeing, developed light weight affordable inerting technology in 2003, yet it is still not in commercial aircraft.

Recent conversations with Boeing encouraged me that Boeing will have inerting in all commercial aircraft coming off the assembly line, but perhaps not until 2008 or later. The NTSB and FAA have a responsibility and legal authority to mandate inerting sooner rather than later. NTSB Most Wanted shows this yellow and progressing slowly – 11 years after TWA 800 and still no inerting is too slow.

The NTSB has built a very nice museum around the TWA 800 wreckage, however, I will tell you this, more than a museum, family members want to know that known technology is in aircraft and at work today to ensure that another fuel tank explosion does not occur.

2. Stop Runway Incursions/Ground Collisions of Aircraft – The worst aviation disaster in the U.S. in 2006 was Delta/Comair 5191 crash, a result of unsafe runway conditions that had been ignored, an under-staffed air traffic control tower and other factors that could have prevented this deadly awful crash.

At the *NADA/F* Annual Meeting February 2007 our members agreed that the understaffing and fatigue in the air traffic control towers today is a most serious threat to aviation safety today.

4. Improve Audio and Data Recorders - the "Black Box". NTSB recommendations for upgraded flight data and voice recorders have been delayed by the FAA for decades. The flight data and voice recorders are the most important tools in air crash investigation. Yes we need expanded parameters, expanded recording time, periodic inspections and more. It is cost effective and good science for the government to mandate the best technology to do the job. In the event of an air disaster people may suspect a terrorist attack, and we will need quick answers.

We request that Congress respond with legislation mandating dual flight data and voice recorders, including a deployable recorder in the rear to better insure that the "Black Box" survives and have a rapid response for the cause of the disaster. Military has had deployable recorders for years, and the government, the public, and investigators will benefit from having state-of-the-art "Black Box" equipment.

5. Human Fatigue . . . The work/rest rules are worse than ever--lost with huge cuts in pay, benefits and lost pensions. American 1420 in Little Rock AR, 8 years ago, June 1, 1999 was the result of a 14.5 hour work day.

6. ***Crew Resource Management . . .*** Recommends more crew training, which has also been greatly reduced.

Recommendations from air crash family members . . .
The FAA responds faster to legislative recommendations, and the time has come for legislation on some of these issues. As shown above, we are asking Congress to mandate:
- ✓ **Required Child Restraint Seats for children under the age of two**, and
- ✓ **Updated Flight Recorders – dual data and voice recorders, with a deployable recorder in the rear.**

Congress now needs to mandate Public Hearings for all commercial, air cargo and jet aircraft disasters in the U.S. The NTSB is not even having a Public Hearing for the Delta/Comair 5191 crash, the worst aviation disaster in 2006. The NTSB "meetings" where government people read industry reports are looking more like a lecture than a true investigative report. Family members want the truth and a Public Hearing is a much needed time for questions, answers and testimony under oath. Since the NTSB has abandoned Public Hearings we ask Congress to mandate Public Hearings.

Money, how to pay for recommendations . . .
Stop the diversion of transportation funds. Passenger Tickets include many taxes and fees, and government can mandate 100% of those funds should be used for aviation safety and security.

Stop any diversion of the Aviation Trust Fund (from the 7.5% domestic airline ticket tax) to general funds for the Iraq War. 9/11 was the worst aviation disaster in history and we should honor the 3,000+ people who died by at least using Aviation Trust Fund for aviation safety and security, and not war in a foreign land. Do not automatically approve higher PFC's (Passenger Facility Charges) until you are assured the funds are going for aviation.

Aviation is public transportation, and everyone who works for the airlines must give their all..
Management is giving themselves outrageous bonuses, golden parachutes, sheltering their huge pensions and stock options, while airline employees have suffered terribly with cuts in pay and benefits, and loss of pensions. The industry is able to fund the recommendations above, but we need your help.

Congress should mandate that airline executive pension plans are part of their airline pension fund for all employees, and everyone is on equal footing to put the company first. Aviation is public transportation. The elitist management perks must end. Management takes the stock down and now gives themselves bonuses when it goes up. The money should be reinvested in the airline. Curb the generous stock options that dilute the value of the airline for all shareholders. This recommendation will produce hundreds of millions of dollars to benefit aviation.

NO cost. Pass full whistleblower protection laws to allow employees to report unsafe situations.

No Cost. Legislation to Require an Annual Safety Meeting with FAA, NTSB, and *NADA/F* members at the table to publicly review the NTSB Most Wanted list and progress of the recommendations. NTSB has asked family members for help, but hard to help when we are excluded from the process. Our members understand the complexity of the technical recommendations, and we all benefit from public participation.

Establish a timeline for the Annual Safety Meeting. Possibly require the NTSB to approve their Most Wanted List by May 1st of each year, or an annual date of their choice, followed by FAA response within 90 days, and the Annual Public Safety Meeting about August 1st each year, including FAA, NTSB, and *NADA/F*.

Thank you on behalf of our thousands of members worldwide for the opportunity to speak today and for holding Public Hearings. There are many serious issues to discuss, but our following requests reflect updating and improving the NTSB Most Wanted List process and accomplishments.
- ✓ **Safe flight for children under the age of two.**
- ✓ **Upgraded recorders.**
- ✓ **Public Hearings to best pursue the truth.**
- ✓ **Allocate aviation money to serve the industry and the airlines.**
- ✓ **Whistleblower protection.**
- ✓ **Require an Annual Safety Meeting with FAA, NTSB and *NADA/F* to ensure public participation in the on-going pursuit of aviation safety and security.**

Gail A. Dunham

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From: Gail Dunham, Executive Director, GADunham@aol.com

Date: May 28, 2007

Subject: **History of Promoting Fuel Tank Inerting to Prevent Center Wing Tank Explosions**

Inerting is lowering the oxygen content with nitrogen to prevent fuel tank explosions similar to TWA 800. The following is a timeline of investigations and research, and *NADA/F's* ten years of participation and actions, to promote the implementation of the technology to prevent fuel tank explosions.

Page 12 of the *NADA/F* Dissent, filed March 13, 2002, has an FAA list of 27 explosions, including military and commercial flights, although there are believed to be more than 27. The Federal Register November 23, 2005 states 17 fuel tank (commercial flight) explosions since the 1960's. Military has been using foam to inert for years.

The November 23, 2005 Notice of Proposed Rulemaking (NPRM) stated that an inerting system will place a blanket of non-flammable nitrogen gas over the fuel for added protection.

Airbus modified planes years ago to increase ventilation and circulation, and the pressure is off and on for Airbus to also implement inerting. Most pressure is on Boeing to implement inerting on their newly manufactured aircraft and existing commercial planes.

Reported October 31, 1999 - Early 1980's Boeing studied fuel-tank problems in one of its jumbo jets in 1980. This was **25+ years ago** and **16 years before a similar explosion of TWA 800**. Boeing did not give the 1980 report to the NTSB until June 1999.

1998 – First FAA ARAC FTIHWG (Federal Aviation Administration, Aviation Rulemaking Advisory Committee, Fuel Tank Inerting Harmonization Working Group, FTIHWG). They met for about six months and concluded inerting was "too expensive."

SFAR 88 - Through the years the FAA recommended a number of ways to reduce the flammability, but admitted that inerting was the only way to 100% prevent a center wing fuel tank explosion. Recommendations included more rigorous maintenance, pipe in outside air, hold more fuel, various ways to attempt to reduce temperature, inspect fuel pumps, improve wiring, and more.

July, 2000 - FAA approved *NADA/F* as a member corporations/organization to participate in the FAA ARAC (Aviation Rule-Making Advisory Committees). *NADA/F* also received a seat on the FAA ARAC Executive Committee (ExComm). *NADA/F* participation has been renewed and today we are one of 66 corporations/organizations of FAA ARAC.

September 2000 – FAA ARAC formed a second FTIHWG (inerting working group). *NADA/F* was able to appoint three members to the Working Group. The Working Group **Final Report was issued June 2001** and **submitted to the FAA ARAC ExComm in August 2001**, and requested **clarifications by March 2002**. The FTIHWG report concluded that inerting was "too expensive."

March 13, 2002 – *NADA/F* was the only member of the ExComm and FTIHWG to file a Dissent with a technical and common sense proposal that inerting is affordable, and aviation safety deserves nothing less. The Boeing representative at this ARAC ExComm meeting publicly stated that inerting was the only technology to 100% prevent fuel tank explosions, and stated that TWA 800 was caused by an explosion in the center fuel tank.

May 2002 – FAA openly shared with the aviation industry that the technology had been developed at the FAA technical center in New Jersey for a simplified, light weight, affordable, system of inerting to eliminate possible fuel tank explosions on commercial aircraft.

December 2003 – FAA recommended for comment a system for flammable reduction.

December 2003 – I met personally with Marion Blakey and asked her to issue a NPRM (Notice of Proposed Rulemaking) to move inerting technology forward. She told me she did not need to issue formal rulemaking because Boeing had agreed to implement the technology.

May 2004 and 2005 – *NADA/F* attended the Boeing Annual Shareholder Meeting as stockholders and confronted the Board and Executives as to when inerting would be on their aircraft. We were told **no planes would be off the assembly line until 2009**, and retrofits on existing aircraft much later if at all.

February 17, 2004 – NTSB continued to push for inerting, and FAA Press Release said the FAA was considering a proposal to mandate new systems to reduce fuel tank flammability on new and existing large passenger jets.

The FAA press release stated that the FAA had issued more that 60 directives (SFAR 88) to eliminate fuel tank ignition sources, but those proposals only reduced ignition sources.

November 23, 2005 – DOT FAA published a NPRM "Reduction of Fuel Tank Flammability in Transport Category Airplanes; Proposed Rule.

May 8, 2006 – Closing date for comment re: FAA Rulemaking Notice – Reduction of Fuel Tank Flammability in Transport Category Airplanes. Former Boeing employee John Hickey, now with FAA, said it would take him 18 months to read the comments. *NADA/F* recommends that the FAA immediately replace Hickey with someone who can read faster and understands that inerting is long overdue.

July 17, 2006 – The 10th Memorial for TWA 800, and we remembered 270 souls lost on that day. We honor those who died by continuing to press for aviation safety so that others do not suffer a similar disaster.

"When you board a commercial flight today, over ten years since TWA 800, there is no inerting system on Boeing planes. The technology is there, and it is affordable and lightweight, and it is long overdue for Boeing to put inerting on their aircraft. An airline may not survive another TWA800-type explosion. The traveling public deserves the highest standards of aviation safety and security. Flying is public transportation."

April 30, 2007 – *NADA/F* requested at the Boeing Annual Shareholder Meeting for meetings with the Executive decision-makers at Boeing to discuss the status of inerting technology on newly manufactured aircraft and retrofit of existing aircraft. *NADA/F* recommended that Boeing fast-track inerting on new and existing Boeing aircraft.

May, 2007 – During recent discussions Boeing stated that they are not considering inerting for only 747's, but plan to implement inerting on all new aircraft coming off the assembly line, including the 787 Dreamliner. The effective date could be 2008. *NADA/F* will continue to press for inerting sooner rather than later.

Figure 9: Case Study of FAA's Rulemaking to Require Child Restraints on Aircraft

FAA's testing of child safety seat for use in aircraft

Photo courtesy of FAA Office of Aviation Medicine

Purpose of Proposed Rule

To mandate child-restraint devices aboard transport aircraft

Key Events

Sept. 1972:	An FAA research report concluded that some auto seats would provide improved crash protection for children in aircraft.
1973-1978:	FAA started but then cancelled two studies on infant restraints.
Dec. 1978:	An aviation accident resulted in two infant mortalities. This accident led NTSB to recommend in 1979 that FAA hasten its research to support rulemaking to most effectively restrain infants in flight (A-79-63).
Jan. 1979:	FAA formed a task force on child restraints.
Feb. 1980:	GAO reported on the lack of timeliness in FAA's efforts to address child restraints. See *How to Improve the Federal Aviation Administration's Ability to Deal With Safety Hazards* (GAO/RCED/80-66, Feb. 29, 1980).
May 1982:	FAA issued a technical standard order prescribing a minimum performance standard for child restraints (TSO C-100).
Feb. 1983:	NTSB recommended that FAA amend its technical order to expand the standards for acceptable child restraints (A-83-1).
Feb. 1985:	FAA revised its technical standard order describing acceptable child seats (TSO C-100A).
1987-1990:	Two aviation accidents resulted in infant mortalities.
May 1990:	NTSB recommended that FAA require child restraints (A-90-78).
July 1990:	The Congress held a hearing on child safety seats.
Sept. 1992:	FAA issued a rule prohibiting air carriers from denying the use of child safety seats.
May 1995:	FAA issued a report to the Congress that concluded that if child restraint devices were required on transport aircraft, passenger diversion to other transportation modes could cause a net increase in fatalities. Based on these findings, the agency made a policy decision not to require child safety seats.
Feb. 1997:	The White House Commission on Aviation Safety recommended that FAA make child restraint systems mandatory.
Apr. 1997:	FAA initiated a rulemaking effort.
Feb. 1998:	FAA issued an advance notice of proposed rulemaking to obtain comments regarding the best way to protect children while onboard aircraft.
June 1998:	The comment period was closed.

Rulemaking Issues

NTSB recommended that FAA hasten its research on child restraints in 1979. NTSB issued a more specific recommendation to require child restraints in 1990. After studying the issue, FAA made a policy decision that child safety seats should not be required on aircraft. FAA initiated the rulemaking process in April 1997, in response to the White House Commission on Aviation Safety's recommendation.

Status of Rulemaking Effort

FAA planned to issue a notice of proposed rulemaking in 2001.

Source: GAO's analysis of FAA information.

U.S. House of Representatives
Committee on Transportation and Infrastructure

James L. Oberstar
Chairman

David Heymsfeld, Chief of Staff
Ward W. McCarragher, Chief Counsel

Washington, DC 20515

John L. Mica
Ranking Republican Member

James W. Coon II, Republican Chief of Staff

June 26, 2007

Ms. Gail A. Dunham
President
National Air Disaster Alliance/Foundation
2020 Pennsylvania Avenue #315
Washington, D.C. 20006-1846

Dear Ms. Dunham:

On June 6, 2007, the Subcommittee on Aviation held a hearing on **The National Transportation Safety Board's Most Wanted Aviation Safety Improvements.**

Attached are questions to answer for the record submitted by Rep. Ben Chandler. I would appreciate receiving your written response to these questions within 14 days so that they may be made a part of the hearing record.

Sincerely,

Jerry F. Costello
Chairman
Subcommittee on Aviation

JFC:pk
Attachment

June 6, 2007
Subcommittee on Aviation
HEARING on
"The National Transportation Safety Board's
Most Wanted Aviation Safety Improvements"

Questions for the Record
To:

Ms. Gail A. Dunham
President
National Air Disaster Alliance/Foundation

Do you think a true public hearing, featuring sworn witnesses and a question and answer session for the general public, should be held regarding Comair Flight 5191 accident in Lexington, Kentucky and if so, why?

NATIONAL AIR DISASTER ALLIANCE / FOUNDATION
2020 Pennsylvania Ave. NW #315 – Washington DC 20006
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www.PlaneSafe.org

To: Jana Denning and Pam Keller
Professional Staff
Transportation Aviation Subcommittee
2251 Rayburn House Office Building, Washing DC 20515
Jana.Denning@mail.house.gov and Pam.Keller@mail.house.gov
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CC: The Hon. Ben Chandler, KY
Will.Glassock@mail.house.gov 202-225-2122-fax
CC: The Hon. Jerry Costello, IL, Chairman, Subcommittee on Aviation
Christa.Fornarotto@mail.house.gov 202-225-0285-fax

From: Gail Dunham, Executive Director, GADunham@aol.com

Date: July 90, 2007

Subject: **Public Hearing June 6, 2007 - Re: NTSB Most Wanted Aviation Safety List**

Response to Question: Do you think a true public hearing, featuring sworn witnesses and a question and answer session for the general public, should be held regarding Comair Flight 5191 accident in Lexington KY? And, if so, why?

Yes, there should be a True Public Hearing, including all of the above, for the Delta/Comair fatal flight 5191 that crashed in Lexington KY on August 27, 2006, the worst U.S. Aviation Disaster in 2006. The family members and the traveling public are entitled to a thorough and true Public Hearing from the National Transportation Safety Board (NTSB).

A True Public Hearing is a presentation of facts, testimony under oath from professional air crash investigators and interested parties, questions and answers, and due diligence with discussions and deliberations. NTSB independent investigators should recess, and with this additional information, update their Findings to present Findings and the most thorough Aviation Safety Recommendations possible--rather than read reports with pre-determined conclusions.

A primary purpose of a Public Hearing for commercial aviation disasters is to produce safety recommendations to prevent a similar disaster. Safety recommendations benefit the industry financially, the traveling public, and aviation worldwide.

For Delta/Comair 5191 the NTSB has decided to have a meeting for a maximum four hours, and assumed weeks in advance that they have the answers. This lack of a scientific approach to the investigation shows flawed conclusions.

Testimony, **QUESTIONS AND ANSWERS** are needed with the Investigator-in-Charge (IIC), FAA participants in the crash investigation, FAA experts in safety research, Chair of each Investigative Committee, members of NATCA (National Air Traffic Controllers Association), those from NATCA who were "party" to the investigation, any and all who served as independent participation and/or oversight of the investigation, and more.

All NTSB Board Members should fully participate at the meeting July 26th. The meeting notice is not clearly Noticed on the NTSB website as of today, July 9th . It is included as a tentative date at May press releases.

The NTSB has six MOST WANTED Aviation Safety Recommendations, including three that may have contributed to the fatal DL5191 crash. After decades of delays in implementing fatal NTSB MOST WANTED Recommendations, DL5191 should have the most thorough Public Hearing possible.

The NTSB is the lead government agency for Air Crash Investigation, and relies on public money, appropriations, for their funding. The family members have paid the worst price possible for this disaster, and have a terrific "need to know." The NTSB is able to show respect for the family members by providing the True Public Hearing they requested. Air crash family members always learn that the crash was a preventable disaster, and the most thorough air crash investigations best serve the public and the aviation industry.

Respectfully Submitted on behalf of our thousands of members worldwide,
Gail A. Dunham

TESTIMONY OF

PATRICIA A. FRIEND
INTERNATIONAL PRESIDENT

ASSOCIATION OF FLIGHT ATTENDANTS –
CWA, AFL-CIO

BEFORE

THE SUBCOMMITTEE ON AVIATION OF THE
TRANSPORTATION AND INFRASTRUCTURE
COMMITTEE

U.S. HOUSE OF REPRESENTATIVES

WASHINGTON, DC

June 6th, 2007

Association of Flight Attendants – CWA, AFL-CIO
501 Third St. NW
Washington, DC 20016
202-434-1300

Thank you, Chairman Costello for giving us the opportunity to testify today. My name is Patricia A. Friend and I am the International President of the Association of Flight Attendants – CWA (AFA-CWA), AFL-CIO. AFA-CWA represents over 55,000 flight attendants at 20 different airlines throughout the United States and is the world's largest flight attendant union. Flight attendants, as the first responders in the aircraft cabin and as airline safety professionals, are following closely a number of the issues raised by the National Transportation Safety Board (NTSB) in their "Most Wanted" aviation transportation safety improvements. The NTSB has done a good job in identifying many vital and important issues needing improvement and we applaud their efforts "to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

While the NTSB has developed a comprehensive list of their "Most Wanted" aviation safety improvements, we were disappointed to see that the issue of requiring restraint systems for children under the age of 2 in aircraft was removed from the list last year. We believe that the issue of restraining all occupants during taxi, take off and landing remains a valid concern and should be addressed.

Today, I'd like to focus primarily on the issue of fatigue and their recommendation to reduce accidents and incidents caused by human fatigue. I know that the members of this Committee are well aware of AFA-CWA's concerns about flight attendant fatigue and the threat that it poses to aviation safety. I have spoken to the Chairman and others on the Committee about how we must address this growing problem and testified before this Committee on the issue back in March of this year. The NTSB itself has recognized the danger posed by fatigue in the transportation industry and has recommended setting working hour limits for transportation operators based on fatigue research, circadian rhythms, and sleep and rest requirements. In fact human fatigue has been on the "Most Wanted" list since 1990. So this discussion is nothing new in that sense.

Specific to the aviation industry, fatigue has been a long-standing concern in accident and incident investigative reports. Based on these concerns there has been a great deal of

aircraft cabin and aware of their surroundings at all times. An inability to function due to fatigue jeopardizes the traveling public and other crewmembers.

According to the Federal Aviation Regulations (FAR's), flight attendants must have a minimum rest period of at least nine hours following any scheduled duty period of less than 14 hours. The nine-hour period can be reduced to as little as eight hours, if the employer schedules a 10-hour rest period following the next duty period. I'd like to make a further clarification at this point. Using the term "rest period" can be misleading because much more must be done during this period of time other than simply sleeping. The "rest period" can begin as soon as fifteen minutes after an aircraft pulls into the gate and continues until one hour prior to their next departure. This "rest period" must also include travel through an airport, waiting time for a shuttle to the layover hotel, travel to the hotel, checking-in, possibly finding time to eat a meal since many of our carriers in an effort to cut costs have removed flight attendant crew meals from the flights, getting prepared for bed, getting dressed and prepared for work the next morning, travel back to the airport and last, but certainly not least is sleep time. Our members are continually reporting that the actual sleep time this schedule allows is in many cases between only 3-5 hours of actual sleep before beginning another full duty day.

The airline industry practice has been to schedule as little as nine hours of rest for flight attendants. It is our understanding that the reduced rest period provision was originally meant to accommodate "day of" scheduling when carriers encounter delays out of the carriers' control such as bad weather or air traffic control delays. The FAA has chosen to ignore the routine implementation of this provision by airline management and the further erosion of meaningful rest periods for flight attendants. To further highlight the FAA's turning of a blind eye to this practice, an FAA spokesperson, in response to a question from the media on this issue stated, "The FAA rules on flight time and rest for both pilots and flight attendants are fundamentally sound. They serve aviation safety very well." We fundamentally disagree.

research done on pilot fatigue. There has also been some research on maintenance fatigue. No one questions that pilot and mechanic fatigue is a serious concern, but we're here to tell you that the industry also needs to realize the flight attendant fatigue is also a very real and serious concern. We believe that the NTSB "most wanted" recommendation setting working hours for flight crews and aviation mechanics based on fatigue research, circadian rhythms, and sleep and rest requirements is flawed in that it does not include the need to address flight attendant fatigue in the recommendation.

I am here to tell you that fatigue is a very real and serious concern for the flight attendant workforce in this country as well and poses a potentially dangerous risk for the safety of the aviation system. As the deep concessions demanded of flight attendants during the recent and ongoing financial turmoil of the airline industry have taken hold it has become clear that airline management hopes to keep our members working longer duty days with greatly reduced time off between duty. Some air carriers are routinely taking advantage of a "reduced rest" provision in the Federal Aviation Administration's Flight Attendant Duty Time and Rest Regulations which allows the minimum rest of nine hours to be reduced to eight. The exception has become the rule and flight attendants are so exhausted that they have informed us that they have in some cases forgotten to perform critical safety functions, including the arming of doors and even fallen asleep on the jumpseats. Even more troubling is that the FAA continues to allow the carriers to schedule reduced rest periods, making them more routine, and has failed to recognize or show any concern for the impact that flight attendant fatigue has on the overall safety of the aviation system.

Multiple studies have shown that reaction time and performance diminishes with fatigue – an unacceptable situation for safety and security sensitive employees. Flight attendants are required to be on board to conduct aircraft emergency evacuations when they are necessary. In addition, they are inflight first responders who are trained to handle inflight fires, medical emergencies including CPR and emergency births. Furthermore, since 9-11 the security responsibilities of flight attendants have greatly increased. It has become even more important for flight attendants to be constantly vigilant of the situation in the

Congress also has expressed concerns. The Omnibus Appropriations for FY '05 contained an appropriation for $200,000 directing the FAA to conduct a study of flight attendant fatigue. The FAA was to report back to Congress by June 1, 2005 with their findings. The Appropriations report language stated: "The Committee is concerned about evidence that FAA minimum crew rest regulations may not allow adequate rest time for flight attendants. Especially since the terrorist attacks of September 11, 2001, the nation's flight attendants have been asked to assume a greater role in protecting the safety of air travelers during flight. Current flight attendant duty and rest rules state that flight attendants should have a minimum of nine hours off duty, that may be reduced to eight hours, if the following rest period is ten hours. Although these rules have been in place for several years, they do not reflect the increased security responsibilities since 2001, and only recently have carriers begun scheduling attendants for less than nine hours off. There is evidence that what was once occasional use of the 'reduced rest' flexibility is now becoming common practice at some carriers."

The FAA delayed release of the report for over one year, even though the study itself was completed. The FAA repeatedly ignored requests from AFA-CWA and members of Congress to release the report and explain the delay in reviewing the study by the Administrator's office. Finally, after AFA-CWA staged an all night "sleep-in" by flight attendants in front of the FAA headquarters in order to draw attention to the issue, the FAA released the report.

In order to complete the required study, representatives of the FAA from the Civil Aerospace Medical Institute (CAMI) initiated an agreement with NASA Ames Research Center to perform an evaluation of the flight attendant fatigue issue. Due to the short internal deadline for conducting the report, the researchers were unable to conduct a thorough and comprehensive study of flight attendant fatigue. It primarily consisted of a review of existing literature on the issue, an evaluation of flight attendant duty schedules and a comparison of those schedules to the current regulations regarding rest. Based just on this limited research, the report concluded that flight attendants are "experiencing fatigue and tiredness and as such, is a salient issue warranting further evaluation." They

also stated that "not all the information needed could be acquired to gain a complete understanding of the phenomenon/problem of flight attendant fatigue."

The report listed a number of recommendations for further study. They were:

1) A scientifically based, randomly selected survey of flight attendants as they work. Such a study would assess the frequency with which fatigue is experienced, the situations in which it appears, and the consequences that follow.
2) A focused study of aviation incident reports in order to determine what role fatigue played in already reported safety incidents.
3) The need for research on the effects of fatigue. This research would explore the impact that rest schedules, circadian factors and sleep loss have on flight attendants' ability to perform their duties.
4) The determination and validation of fatigue models for assessing how fatigued a flight attendant will become. Developing a reliable fatigue modeling system would be an important tool for the aviation industry in helping to determine when rest periods should be scheduled.
5) A study of International policies and practices to see how other countries address these issues.
6) Development of training material to reduce the level of fatigue that may be experienced by flight crews and to avoid factors that may increase fatigue levels.

I believe that it is abundantly clear that flight attendant fatigue is real, it is a problem and that it is growing. Some may argue, and indeed have argued, that an error caused by flight attendant fatigue is not as serious as an error caused by pilot fatigue or maintenance fatigue because the flight attendant error does not cause the aircraft to crash. These same people would also claim that flight attendant fatigue does not warrant inclusion on the "most wanted" list. This argument is short sighted. An error caused due to flight attendant fatigue can lead to a tragic loss of life in the event of an inflight emergency or during an evacuation.

We know that there have been incidents over the years where flight attendant fatigue was an issue. For example, on July 9, 1995, an ATR72 operated by Simmons Airlines, as American Eagle Flight 4127, experienced the loss of the rear cabin entry door during the takeoff climb. The flight crew was able to circle around and land successfully. The aircraft received minor damage and one flight attendant received minor injuries. The flightdeck crew, the other flight attendant and the 61 passengers reported no injuries.

The probable cause of the incident was the flight attendant inadvertently opening the door inflight due in part to flight attendant fatigue from a lack of sleep and the long duty day. The flight attendant estimated that she had approximately 5 hours of sleep the night before the incident flight. Also, contributing to the incident was a change in the design of the door locking mechanism.

If we add the human factors issue of fatigue - impaired judgment - and then add the human factors design issue - the re-design of the door - we have a perfect human factor interaction error in the Simmons incident. Industry is continually working to build aircraft that alleviate the human factor design issue, so why would we say the human factor issue of fatigue in the cabin isn't a concern? We should work to address the fatigue factor just as well.

Take another example of an emergency. On August 2, 2005, an Air France Airbus A340-313 aircraft overran the end of the runway and came to a rest in a ravine just outside the perimeter of Toronto's Lester B. Pearson International Airport. The flight had 12 crew members and 297 passengers on board.

After the aircraft stopped, flight attendants observed a fire outside the aircraft and ordered an evacuation. The flight attendants facilitated a fast evacuation from the emergency exits while an intensifying fuel-fed fire was engulfing the aircraft. Only four of the eight emergency exits equipped with slides were usable for evacuation, due to one slide failure and fire around the vicinity of the other slides. Amazingly only two crew members and

ten passengers were seriously injured. The aircraft fuselage was eventually consumed by fire.

If the flight attendants on Air France Flight 358 had been fatigued the outcome of this evacuation could have been very different. What if they had pulled the quick release handle on one of the remaining four useable slides instead of the inflation handle? If that had happened, the crew would have then been down to only three exits for the evacuation. This could have very likely happened as we know that flight attendants make mistakes due to fatigue like we saw in the Simmons incident

Fortunately, flight attendant mistakes are often not as obvious because of the current extraordinarily low number of accidents. But the potential for a serious incident is there. We have received reports from flight attendants admitting that due to fatigue they had forgotten to arm their evacuation slides, or due to fatigue had forgotten they had unaccompanied minors onboard and allowed them to leave the aircraft by themselves. There are numerous examples of flight attendants falling asleep or nearly falling asleep on their jumpseats during landing. The same jumpseats that are located next to the emergency exit doors which would need to be used in case of a landing emergency evacuation.

We also have examples from flight attendants that have said they are too fatigued to drive home, or operate their car, for fear of getting into an accident. We even have reports of members being stopped by law enforcement when driving due to the fact that police believed they were driving under the influence of alcohol because of their erratic driving. Just prior to that they would have, by the FAA's account, been okay to operate the emergency equipment onboard an aircraft in a fatigued fashion. However, as a fatigued driver on the road they are a hazard to others.

All these safety mishaps can have devastating ramifications. Fortunately they have not, which is why the regulatory agencies, as well as the NTSB, must further investigate and recommend changes to address the safety concern of flight attendant fatigue before a serious incident happens.

Many of the same issues that contribute to pilot fatigue contribute to flight attendant fatigue. One of these issues is the length of a continuous wakeful period. Flight attendants are even more susceptible in this area because, unlike pilots, we do not have a regulatory hard limit on actual flying time in a 24 hour period. The timing of work hours, time zone shifts, and any subsequent impact of off-duty sleep quality also similar to pilots contribute to flight attendant fatigue and in fact may pose a greater risk to flight attendants.

To ensure safety of the entire transportation industry as a whole we must look at all workers that could have an effect on the survival rate of passengers, not just the pilot who operates the aircraft or the maintenance personal that fix a broken part. We are, after all, operating the equipment that fights fires, provides medical first response, and helps with a speedy evacuation. To say that flight attendant fatigue should not be a concern, or is not as important because we are not the sole factor that could cause an accident, or that we don't operate a moving vehicle, is to acknowledge that saving passenger lives doesn't matter.

One other issue on the NTSB's "Most Wanted List" is preventing runway incursions and ground collisions of aircraft. AFA-CWA supports the continued research and development of technologies that will provide warnings directly to flight crews of any potential incursions or collisions. In February of this year a United Airlines Boeing 737 nearly collided with a snowplow after landing at Denver International Airport. Luckily for everyone onboard that aircraft an emergency situation was avoided; unlike the passengers of two Northwest Airlines aircraft that collided near the gate area in Minneapolis, Minnesota in May 2005.

The Northwest Airlines DC-9 was taxiing to the gate area when it collided with a Northwest Airlines A-319 that was being pushed back from the gate. The evacuation was not immediate as both crews tried to evaluate what had just happened. Specifically the DC-9 was evacuated out the aft stairs as the front doors were unusable. The situation on

the A-319 was not as bad and eventually the passengers were evacuated out the forward left door using the emergency slide. The collision resulted in crew injuries mainly onboard the A-319 that was being pushed back. That crew had been conducting their emergency briefing announcement at the time, standing in the aisles, when they impacted the other aircraft thereby sustaining their injuries.

I am pleased to say that the outcome of both these events was positive in respect to the fact that there was no loss of life.

In closing, I want to go back again to the logo for the NTSB's Most Wanted List. It is a "program to increase the public's awareness of, and support for, action to adopt safety steps that can help prevent accidents and save lives."

Save lives, are the operative words and we applaud the NTSB's work on these issues and their commitment to preventing accidents and saving lives. But it must be pointed out that their approach to the risk posed by fatigue must be more comprehensive. We can all agree that it is possible that a flight attendant error, due to fatigue, could possibly result in the death of some of our passengers. Therefore, it is crucial that we be just as concerned with flight attendant fatigue as pilot and mechanic fatigue if we hope to achieve the NTSB's stated goal of preventing accidents and saving lives.

Again, I want to thank the Committee for holding this hearing and I look forward to answering any questions that you may have.

STATEMENT OF PEGGY GILLIGAN, DEPUTY ASSOCIATE ADMINISTRATOR, OFFICE OF AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION BEFORE THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE, SUBCOMMITTEE ON AVIATION, ON THE MOST WANTED LIST OF THE NATIONAL TRANSPORTATION SAFETY BOARD, ON JUNE 6, 2007.

Chairman Costello, Congressman Petri, Members of the Subcommittee:

I am pleased to appear before you today to discuss the state of aviation safety with a focus on the recommendations of the National Transportation Safety Board's (NTSB) Most Wanted List. The relationship and interaction between the Federal Aviation Administration (FAA) and the NTSB is an important component in aviation safety. Our roles are different, but complimentary. Through accident investigation, the NTSB makes findings of probable cause that lead to the issuance of safety recommendations. The FAA receives the vast majority of the NTSB's safety recommendations. In turn, the FAA takes action on the vast majority of the NTSB's recommendations, even when the recommendation asks that we develop new technology to address the recommendations. We always value the intent of the recommendations, even if we are unable to do exactly what the Board recommends. Their recommendations represent the ideal, our consideration of those recommendations must, by law, factor in certain realities.

At the same time FAA has a proactive safety agenda that is developed independently from the NTSB. Naturally, there are overlapping issues, and in many cases, the FAA is already pursuing safety actions well before the NTSB recommendation is received. We do not wait to act until the NTSB has issued a recommendation. Just one example of this would be the inspections that were mandated on the A300 composite rudders, following the American Airlines Flight 587 accident. As the NTSB continued to uncover key

information in the investigation, we were gathering fleet information of our own. In fact, many of our safety priorities over the years have not been in response to the NTSB at all. For example, Traffic Alert and Collision Avoidance Systems (TCAS); the Commercial Aviation Safety Team (CAST) Safety Enhancements that indicated the value of Terrain Awareness and Warning Systems (TAWS); and the initiatives that resulted from Enhanced Airworthiness Program for Airplane Systems (EAPAS) were all developed independent of any NTSB recommendations . The FAA has a strong sense of responsibility as the world-wide leader for aviation safety, but we do appreciate that it is the role of the NTSB to push us to attain ever more ambitious standards.

The historic safety record we are currently experiencing has been the subject of discussion before this Subcommittee many times recently. Today's aviation safety is not attributable to luck or good fortune, but rather it is due to hard work and innovative safety initiatives. It is important that we put the safety record into the proper context in order to have a better understanding of why it has come about.

About half of all the aviation in the world takes place in the United States. It is a large, complex system with strong regulation, with 116 major carriers and more than 2,300 smaller commuter and on-demand operators. Our scheduled carriers alone operate over 32,000 flights each day. Before an aircraft even enters our system, it has gone through a rigorous approval process against design standards that are the toughest in the world, followed by a separate approval process for production and quality control.

There are many ways to measure safety, and we use different approaches as we constantly analyze risks and evaluate the benefits of safety measures. One measure is simple and straight forward. It compares the number of commercial aviation fatalities per 100 million people carried. In the early days of commercial flight, the number of fatalities reflected the newness of the venture. In 1946 we had about 1,300 fatalities for every 100 million people carried. Jumping ahead to just the last decade, by 1994-1996, the current baseline period against which we measure our progress, that number had dropped to 45.7 fatalities for every 100 million people carried. And while that record must be considered remarkable, it has been significantly improved upon. The average from 2004 to 2006 has been 4.2 fatalities for every 100 million carried.

The safety improvement in commercial aviation is an incredible accomplishment, shared by the entire aviation community and it is a story that continues to improve. Some of the major improvements that have contributed in this decline in fatalities include pressurized aircraft capable of flying above most weather, and precision guidance systems which allow safe landings in limited visibility. The jet engine, the single greatest safety improvement, provides modern aircraft with large performance margins, and levels of reliability that are orders of magnitude better than the last piston engines in airline service.

But perhaps the most telling fact that explains the reduction in fatalities is the answer to the question, "What are the major causes of airliner accidents today?" Because the answer is, "There are none." Let me cite three specific types of accidents which, like

polio and smallpox, used to take a persistent toll, and which, like polio and smallpox, have been virtually eliminated through human ingenuity and determination in finding and implementing solutions. I say virtually eliminated because I cannot say with certainty that we will never see one of these accidents again, but I can say with certainty that they will not return as persistent and recurring accident types.

Mid-Air Collisions

The last mid-air collision in which a U.S. Airliner was involved occurred 29 years ago. While the installation of Traffic Alert and Collision Avoidance Systems (TCAS) is the most often cited improvement, as with most safety improvements there was a layered approach, including implementation of virtually universal radar coverage in the U.S. National Airspace System, installation of conflict alert technology in the radar system, and effective training of controllers and pilots on the use of this technology. This success story is instructive on two points as we look for technology to improve safety in other areas including the critical runway environment. The first point is that the promise of a specific technology can only be safely realized through a methodical implementation process, which assures that safety will not be degraded by unintended consequences of implementation, for example problems like software glitches or high false warning rates. The second point is that even with superior technology, the human element remains critical. This was tragically demonstrated in the skies over Germany five years ago, as the pilot of a Russian airliner, which was equipped with a state-of-the-art TCAS system, failed to properly respond to a resolution advisory because it conflicted with an air traffic controller instruction.

Controlled Flight into Terrain (CFIT)

The last commercial airplane Controlled Flight into Terrain (CFIT) accident in the United States also occurred 29 years ago. There are many parallels between the successful interventions addressing CFIT and mid-air collisions. While the institution of ground proximity warning systems (GPWS) is cited as the single greatest safety enhancement to counter CFIT, again, a layered approach was implemented, which included wide radar coverage and minimum safe altitude warning technology. Problems of false warnings had to be addressed as GPWS technology evolved, and the crew training element remained critical. In fact, the last airliner CFIT in the United States occurred when the flight crew disabled the GPWS, after mistakenly thinking the alarm was due to a temporarily excessive descent rate. The last CFIT accident for a U.S. commercial airplane outside the United States occurred 12 years ago in the non-radar environment near Cali, Columbia. Since that accident commercial airplanes, along with all turbine-powered aircraft with six or more passenger seats, are required to be equipped with enhanced GPWS, which uses terrain mapping technology to provide earlier and more effective warnings.

Windshear

Again, while the on-board warning system is a key improvement, progress has been made on other important safety enhancements, such as ground-based windshear detection systems, prediction and detection of severe weather, displays of this key information to pilots, and in the critically important area of pilot training. Modern realistic simulators

that mimic the flight environment have provided situational training for pilots to recognize and either avoid or safely escape from severe windshear encounters. Based on this unmatched record of continuous improvement, the aviation community faces the critical safety issues we are discussing today with confidence and with the unabated determination to further improve.

It is within this context that I would like to touch upon several of the safety areas on the NTSB's Most Wanted List and what FAA has done in those areas, both in response to NTSB recommendations and on our own initiative.

Fuel Tank Explosions

In the aftermath of the TWA 800 tragedy, all aviation safety experts were focused on how to prevent center fuel tank explosions. The accident fundamentally altered the assumptions held not only by the FAA and NTSB, but by the entire aviation community. Preventing another such accident required us to look at different safety options, including how to eliminate ignition sources and how to reduce the flammability of the fuel tank. In the 11 years that have passed since the accident, the FAA has been extremely effective in increasing the safety of fuel tanks. We have issued more than 100 Airworthiness Directives (ADs) and a Special Federal Aviation Regulation (SFAR) to reduce or eliminate ignition sources. The ADs addressed a broad range of issues, including fuel pump manufacturing discrepancies, wear of fuel system wiring, shielding of fuel system components, and overheating solenoids. The SFAR, issued in May 2001, changed the way airplanes are designed, operated and maintained. By the end of 2002, the required

manufacturer design reviews resulted in the identification of more than 200 previously unknown ignition sources. As new ignition sources were identified, the FAA issued additional ADs to address them. But the sheer volume of ignition sources confirmed that reducing fuel tank flammability was the necessary and complementary strategy to improve fuel tank safety.

Beginning in 1998, the FAA charged the Aviation Rulemaking Advisory Committee (ARAC) to evaluate options for reducing the flammable vapors in fuel tanks. The first of two ARAC groups determined that on-board inerting was too costly and impractical. In 2001, the second ARAC working group determined that a ground based inerting concept presented a new set of safety and operational issues at airports. The ARAC group acknowledged that, at that time, on-board inerting options (most of which were used by the military in conditions very dissimilar to commercial aviation) were too complex, heavy, unreliable, and costly.

What became clear was that the solution to this pressing problem required entirely new approach and FAA set about finding that solution. FAA scientists and engineers challenged the assumptions that existed at that time and ultimately developed the first prototype inerting system for commercial airplanes. The purpose of an inerting system is to replace the oxygen in the fuel tank with an inert gas, such as nitrogen, in order to prevent the ignition of fuel vapor. This means that even if all ignition points have not been identified and dealt with, there is nothing that the ignition source can ignite, thus averting a catastrophic event. On military aircraft, engine exhaust was typically used to

produce the inert gas, but the technologies available could not meet the safety standards required by the FAA and were designed to operate only a few hours per day or per week compared to the average 14 hours per day flown by a commercial airplane.

More recently, nitrogen has been used to render the fuel tank inert. Various techniques were considered for separating nitrogen from air for use in inerting. In May 2002, the FAA unveiled a prototype on-board inerting system. We believe our prototype is the simplest and most reliable technology now known. Finally, the FAA prototype is substantially lighter and smaller than the systems the military uses. This combination amounted to an important breakthrough.

To remove the likelihood of explosion from unidentified ignition sources, the FAA expects to finalize a rule to require airplane operators to reduce the flammability levels of fuel tank vapors. We believe fuel tank inerting is the best solution for meeting the standards outlined in the agency's proposal.

The FAA is extremely proud of our work in this area. A tragic aircraft accident resulted in the NTSB making safety recommendations for which there was no existing technology at the time. Utilizing all resources available to us, we kept working the problem from all possible angles. We challenged assumptions and created new solutions. This is an example of the aviation community working at its best, combining ingenuity and resources to make flying safer.

Voice and Flight Data Recorders

The FAA views data recorders as important tools for the accident investigation; consequently, we are extremely sensitive to NTSB requests for improvements in this area. The information provided by Digital Flight Data Recorders (DFDRs) and Cockpit Voice Recorders (CVRs) is often the cornerstone in determining the probable cause of an accident or incident. Therefore, the FAA has had a generally positive reaction to NTSB recommendations for improvements to data recorders, including those for additional parameters to collect more information. We are in the process of three rulemaking projects that will address a number of the NTSB recommendations on data recorders. However, as much as FAA understands the priority NTSB places on data recorder recommendations, the fact is that there are no major accidents for which a probable cause determination has not been concluded. The value of data recorders is realized only after an accident when the information has been collected and analyzed; they do not prevent accidents in and of themselves. As accident rate attests, we must be extremely prudent with regard to how we proceed to improve aviation safety.

The first of these rulemaking projects is an NPRM that proposed a series of improvements to Cockpit Voice Recorders and Flight Data Recorders. Some of the proposed improvements are longer recording times, independent power sources for each box, and emergency power sources to keep the boxes running when the aircraft's main power source is disrupted.

The second rulemaking activity is an NPRM, published in November 2006, to specifically address flight data recorder (FDR) data filtering issues. This proposed rule clarifies the FAA's intent to ensure the accurate recording of flight data under all operating conditions. This clarification will ensure that the NTSB has the most accurate data readily available to conduct investigations in a timely manner.

The third rulemaking project began in November 1999 when the FAA proposed the addition of flight recorder equipment to monitor the Boeing 737 rudder system after several rudder system anomalies had been identified. The FAA made several safety improvements to the B737 rudder system, and subsequently mandated a redesign of the rudders system. In September 2006, the FAA published a supplemental notice of proposed rulemaking to assess the need for recording additional B737 rudder parameters.

The improvements required by these three rulemaking efforts will achieve the right balance between enhancing accident investigation and wisely investing our safety resources.

Icing

This is another area where the Board has recommended that the FAA design the solution, test the effectiveness of the solution, and then mandate the solution. As meteorologists will attest, simply understanding some of these icing phenomena is difficult and complex. And then determining how to address these phenomena to assure safe aircraft operations takes time. That's why we have taken a multi-pronged approach to the icing issue by

taking immediate safety actions, as well as performing longer-term research to improve our understanding of icing phenomena.

One of our most effective tools to address safety issues is the airworthiness directive (AD). We have issued over 100 ADs to address multiple threats from icing on over 50 different aircraft models. These ADs cover safety issues ranging from crew operating procedures in the icing environment to direct design changes. These ADs have had the effect of significantly reducing the icing risk to the overall fleet.

Following the issuance of ADs, the FAA conducts general rulemaking intended to institutionally prevent the same icing risk for future airplane designs that were averted by implementing ADs on specific models. FAA is presently in the process of two rulemaking efforts on icing. The first, which we anticipate publishing as a final rule, requires designers to demonstrate specific airplane performance handling qualities for flights in icing conditions. The second rulemaking is an NPRM, published on April 26, 2007, entitled Activation of Ice Protection, which would introduce requirements to ensure timely activation of ice protection systems (IPS). The proposed rule would require installation of an ice detector or activation of the IPS based on visible moisture and temperature..

The recommendation that we have not yet been able to address in rulemaking is related to a phenomenon known as supercooled large droplet (SLD) icing conditions. This phenomenon has been a challenge because conditions that result in SLD are difficult to

forecast and detect. It is also not easy to reproduce in a test environment. So, to first forecast and characterize SLD, then reproduce it, and finally evaluate its affect on aircraft operations has required extensive research. Our research has engaged leading experts from academia, industry, and the government. Due to the technical complexity, our activities continue today. We are committed to identifying the right solution for long term design and operational requirements for the SLD threat. In addition, we have issued numerous ADs that direct the crews of certain airplane designs to monitor and detect early signs of the onset of SLD conditions and to exit the area immediately. These ADs serve as an effective interim measure until such time we complete our research on SLD and complete the necessary rulemaking.

Runway Incursions

Reducing the risk of runway incursions is one of the FAA's top priorities. The agency has been aggressively addressing the issue and has made progress reducing the most serious incidents, particularly those involving commercial aircraft. The number of serious runway incursions – called Category A and B – has dropped by more than 40 percent since fiscal year 2001. In 2006 there was only one serious incursion for every 2 million take-offs and landings.

The FAA has implemented important new technologies to allow tower controllers to see everything that takes place around them. One of these is the Airport Movement Area Safety System (AMASS). AMASS tracks ground movements and provides an alert so controllers can notify the crew if evasive action is required. The FAA has installed

AMASS at the nation's top 34 airports. ASDE-X, or Airport Surface Detection Equipment, Model X, is an even more sophisticated surface detection technology. While AMASS is radar-based, meaning signals might bounce off rain and fog, ASDE-X integrates data from a variety of sources, including surface movement radars located on air traffic control towers or remote towers, multi-lateration sensors, and aircraft transponders, to give controllers a more reliable view of airport operations, especially during bad weather.

By fusing the data from these sources, ASDE-X is able to determine the position and identification of aircraft and transponder-equipped vehicles on the airport movement area, as well as aircraft flying within five miles of the airport. Controllers in the tower see this information presented as a color display of aircraft and vehicle positions overlaid on a map of the airport's runways, taxiways and approach corridors. The FAA is in the process of enhancing ASDE-X with visual and audio alarms that will alert controllers to potential collisions.

The first ASDE-X was activated for operational use and testing at General Mitchell International Airport in Milwaukee, Wisconsin, in June 2003. In addition to Milwaukee, ASDE-X is now operational at T.F. Green Airport in Providence, RI; Orlando International Airport in Orlando, FL; Hobby Airport in Houston, TX; Lambert-St. Louis International in St. Louis, MO; Seattle-Tacoma International in Seattle, WA; Bradley International in Hartford, CT; and Hartsfield-Jackson International Airport in Atlanta, GA. ASDE-X is scheduled to be deployed at all 35 OEP airports.

The FAA is also testing new technologies that will alert pilots to potential runway incursions. One of these, called Runway Status Lights, is just what is sounds like – an advanced series of runway lights, not unlike traffic lights, that tell pilots whether or not runways are clear. The operational evaluation of the runway entrance lights using ASDE-X surface surveillance was completed in June 2005 at Dallas/Ft. Worth International Airport, and the system showed promising initial results. An enhanced lighting configuration is being installed on a second runway at DFW this year. The evaluation of Runway Status Lights with AMASS began last year at San Diego's Lindbergh Field. Other new technologies include an experimental system called the Final Approach Runway Occupancy Signal (FAROS), which is being tested at the Long Beach/Daugherty Field Airport in California. FAROS is designed to prevent accidents on airport runways by activating a flashing light visible to landing pilots to warn them that the runway is occupied and hazardous.

Fatigue

Flight and Duty time rules have been in existence since the 1950s, and the 121 domestic and 135 scheduled rules were updated in 1985. The rules on pilot flight time and rest have evolved along with advances in commercial air travel. The FAA is confident that, overall, the airline industry complies with the FAA's current rules. In the intervening time, much research has been done on fatigue, which has resulted in a better understanding of complex fatigue-related issues. The research tells us that this issue does not easily lend itself to a set of prescriptive rules. While the existing prescriptive rules

have served us well, they do not allow for the flexibility needed to address the various flight regimes that exist.

Understanding the limits of a strictly prescriptive regulatory regime, we worked to alleviate fatigue through other means. Fatigue countermeasures were first developed by NASA, and include providing in-flight rest, as well as training crew members on the use of proper diet, exercising, and even caffeine to manage fatigue. Fatigue countermeasures are covered during Crew Resource Management (CRM) initial training and during CRM recurrent training.

It is also critical to understand the role that personal responsibility plays in fatigue and why prescriptive rules can only provide a framework for safety. Crew members, mechanics, air traffic controllers, everyone involved in the safety of flight must make a personal commitment to report for work well rested and ready to perform their duties. No regulatory scheme can instill that sense of personal commitment and professionalism.

One thing we know, aviation operations will always challenge us in the area of flight time and rest. Aircraft design allows for longer and longer flight times. Recently, FAA issued approval to Delta Airlines for flights in excess of 16 hours from New York JFK to Mumbai, India. This approval was our first implementation of a fatigue risk management approach. Delta proposed – and we analyzed and approved – a detailed plan to assure the crew is rested before the flight begins, is provided appropriate rest throughout the flight, and have sufficient rest before conducting the return flight.

The procedure specifically addresses the impact to circadian rhythm, including the recognized affect of circadian law which occurs at specific times in the daily cycle. This is an example of where we need to move in the future – away from prescriptive rules and into fatigue risk management.

Conclusion

In conclusion, Mr. Chairman, let me restate that the FAA's first priority has always been, and will always be, safety. As I said at the outset, we very much appreciate the unique relationship FAA has with the NTSB and we consider them a vital partner in advancing the safety of our Nation's skies. The interaction between the FAA and the NTSB is certainly a factor in the unparalleled safety record we have achieved in recent years. NTSB has the responsibility to push us and the industry by identifying everything that could be done. The FAA has the responsibility to determine the actions that will provide the greatest safety benefit. We believe we have achieved the proper balance and are, understandably, proud of the safety record we are currently enjoying. We will continue to strive to implement NTSB's recommendations as quickly as prudence, technology and science will allow.

This concludes my statement, and I would be happy to answer any questions the Committee may have.

Questions for the Record from Congressman Jerry Moran to Margaret Gilligan, Associate Administrator for Aviation Safety for the Federal Aviation Administration

1. **Ms. Gilligan, How long has the elimination of flammable, fuel/air vapors in fuel tanks on transport category aircraft been on the NTSB's Most Wanted List?**

Response: In the area of fuel tank flammability, the NTSB issued recommendations A-96-174 and A-96-175 on December 13, 1996. The interim action flammability recommendation (A-96-175), regarding the use of short term operational procedures, was added to the Most Wanted list in 1997. The long term fuel tank flammability recommendation (A-96-174) was added to the NTSB Most Wanted list in 2002.

The FAA has taken a two-pronged approach to the problem of fuel tank explosions; ignition source prevention and flammability reduction. We began our work on ignition prevention in 1996, because at the time, commercially practical flammability reduction technology did not yet exist. New regulations to address ignition sources (for both the existing fleets and new designs) were published for public comment on October 28, 1999 and became final on June 6, 2001. Since 1996 we have published numerous airworthiness directives to correct potential ignition sources. Shortly after the NTSB issued the initial recommendations in December 1996, we also began working with industry to determine if a practical method was available to eliminate or reduce fuel tank flammability – at that time, the answer was "no." Subsequent FAA research, conducted from approximately December 1997 to December 2002, was the critical factor in the development of the technology. Once we understood the science and developed a viable solution, rulemaking could proceed. In November 2005, we published the proposed fuel tank flammability reduction rule to require installation of a flammability reduction means for high risk fuel tanks on new and existing transport airplanes.

2. **How can airlines meet proposed FAA rules to reduce flammability levels of fuel tank vapors other than installing fuel tank inerting systems?**

Response: To the extent possible, FAA rules are performance based. That means we set requirements for how well the system must perform rather than dictating the use of a particular design or technology or specifying design details. The proposed rule does not specifically require inerting to be used. Instead, it lays out requirements for the flammability of the air-fuel mixture in the tanks. Our research has found fuel tank inerting using nitrogen is in many cases the most economical and practical means currently available. However, there are a number of other technologies or techniques that can be used to meet the performance requirements of the proposed rule, including systems that provide fuel cooling, pressurized fuel tanks, or filling the fuel tanks with polyurethane foam.

3. Do Fuel-tank inerting systems alert the aircraft crew when it is safe to leave the ground, by monitoring the combustibility of the air-fuel vapor mixture in fuel tanks?

Response: The proposed rule is intended to reduce flammability to levels low enough to provide an acceptable level of safety with no need for monitoring the combustibility. Flammability reduction and ignition prevention, taken together, should virtually eliminate fuel tank explosions. There is no specific requirement within the proposed rule for the flight crew to be alerted regarding the oxygen concentration within the fuel tanks. However, in order to meet the system performance and safety requirements in the regulations, manufacturers conduct system safety assessments to make sure their designs are sufficiently robust and reliable. Based on those safety assessments and the details of their specific design, some manufacturers may need to incorporate system performance monitors and/or maintenance alerts, while others may not. It depends on the details of each design.

4. Do any current fuel tank inerting system designs have in-tank oxygen sensor to accurately measure whether a fuel tank is inert?

Response: The technology to accurately, reliably, and safely measure oxygen concentrations in fuel tanks is evolving. For example, it would be important to ensure that the oxygen sensor, which is an electrical device, does not itself introduce a new potential ignition source. The FAA has not received any requests for approval of oxygen sensing systems that could be installed in a transport airplane fuel tank. To date, the only in-tank oxygen analysis systems developed are for research or used as supporting equipment for inerting system demonstrations during certification flight tests. These systems are not ready for commercial use.

5. Do pilots today have a cockpit gauge that tells them the oxygen levels in fuel tanks?

Response: As indicated in Response #4, fuel tank oxygen concentration sensing systems have not evolved to a point that they are economically feasible and technologically practical to install on commercial transport airplanes. However, depending on the details of the design, the combination of proper maintenance, inherent characteristics of the fuel tank flammability reduction system, and/or system operation monitoring, in conjunction with ignition prevention, provide an acceptable level of assurance that a fuel tank explosion will not occur.

6. I understand that the Air Force is developing oxygen sensors for its C-17 cargo transport aircraft. Does the FAA plan to apply this technology to commercial aircraft carrying passengers?

Response: At this time, civil transport manufacturers are developing airplane fuel tank flammability reduction system designs that will meet the requirements without the need for oxygen sensors located inside fuel tanks. If such sensors become available, meet FAA requirements, and are commercially viable, manufacturers may choose to incorporate them into their future designs.

Responses to Questions for the Record
For Margaret Gilligan
Deputy Associate Administrator for Aviation Safety
Federal Aviation Administration

From the Hearing on
"The National Transportation Safety Board's
Most Wanted Aviation Safety Improvements"
June 6, 2007

1. The NTSB regards the FAA's response to runway incursions-one of the NTSB's ten most wanted safety improvements-as unacceptable due to the five-year delay from the time when the NTSB made its recommendation until the time when the FAA started to evaluate technologies to mitigate runway incursions. How do you explain this delay and if the FAA would have begun its evaluation immediately, is it conceivable that we would have already seen technological improvements put into use?

When the NTSB issued this recommendation in July 2000, the FAA's efforts evaluating technologies to mitigate the risk of runway incursions had been underway for more than 10 years. In May 1988 the Massachusetts Institute of Technology's Lincoln Laboratory had published a study on Airport Surface Traffic Automation (ASTA) which identified the highest priority function to be an improved surface surveillance and communication system. Following the acquisition and deployment of the first AMASS systems, in 1992 the FAA began researching the development of a runway status light prototype and conducted initial demonstrations at Boston's Logan International Airport. This research concluded that the surveillance technology was not sufficiently mature to produce an operationally suitable status light system.

Following procurement of improved surface surveillance technology through the ASDE-X program, the FAA began developing the current version of the runway status light technology in 2001. The three-phase engineering, development and test program was designed to ensure that all critical design and operational issues were discovered and addressed as early as possible to reduce operational issues during field testing. This approach proved successful as evidenced by the positive results from the operational evaluations at Dallas Fort Worth International Airport and San Diego International Airport.

In addition to the runway status light development, in September 2000 the FAA released a Surface Technology Broad Agency Announcement inviting industry to offer new ideas and technology concepts that could be applied to reduce runway incursions. The announcement resulted in the award of six technology demonstration contracts one of which evolved into the development of the Final Approach Runway Occupancy System (FAROS) that is currently under field testing at Long Beach Airport.

2. The NTSB names operator fatigue on its most wanted safety improvement list and in April 2007, the NTSB recommended that the FAA work with the air traffic controllers to develop policies that will provide adequate rest periods and fatigue awareness. What developments have occurred between the FAA and the National Air Traffic Controllers Association since the April recommendation?

As a direct result of the National Transportation Safety Board recommendations the Federal Aviation Administration has convened a working group to develop shift rotation and scheduling guidelines. Members of the Air Traffic Organization operational service units, the Operations Planning service unit, and the Civil Aerospace Medical Institute currently makeup the working group. The National Air Traffic Controllers Association will be invited to participate by providing subject matter expertise.

3. Has the FAA responded to the following NTSB Safety Recommendations from December 12, 2006? If the FAA has responded, what actions have been taken to ensure that these recommendations are adequately implemented and adhered to?

Require that all 14 Code of Federal Regulations Part 121 operators establish procedures requiring all crewmembers on the flight deck to positively confirm and cross-check the Airplane's location at the assigned departure runway before crossing the hold-short line for takeoff.

Require that all 14 Code of Federal Regulations Part 121 operators provide specific guidance to pilots on the runway lighting requirements for takeoff operations at night.

A copy of the FAA's initial response to the NTSB recommendations from the Comair flight 5191 accident is attached. In addition, attached are copies of the two Safety Alerts for Operators (SAFO) and the Information for Operators (InFO) issued in response to these recommendations.

4. Given the fact that some safety recommendations are still on the NTSB most wanted list after fifteen years, how can the traveling public have any confidence that the FAA is serious and committed to ensuring the safest flying experience possible?

The current level of safety in the system, as measured by the accident rate, demonstrates FAA's commitment to ensuring the safest flying experience possible. The commercial aviation accident rate has improved consistently and dramatically since the most wanted list was initiated in 1990. While some safety issues remain on the NTSB most wanted list for a long time, it does not mean the issue has not been seriously addressed by the FAA. For every issue on the list the FAA has a set of measures in progress or already completed. In fact while broad issues may remain open on the list, many individual recommendations under these issues have been closed. Attached are descriptions of

actions taken relative to icing and fuel tank safety, which show the extent of FAA actions on those recommendations, despite the recommendations remaining open.

5. If the FAA is unwilling to enforce its own rules relative to air traffic controller staffing, why should the public assume that the FAA is enforcing any standards on the airline industry?

The FAA continues to manage and address air traffic controller staffing levels and scheduling practices as well as the already high standards placed on the airline industry. The safety record of commercial aviation substantiates compliance with the safety standards by the airline industry. This has been accomplished through the FAA's rulemaking, certification and enforcement processes.

6. Ground radar supplies air traffic controllers with a better view of traffic during low visibility and periods of darkness. In your view, would the availability of ground radar have reduced the chances of the Comair Flight 5191 accident in Lexington, KY from happening?

The Comair accident remains under investigation by the NTSB, and it is inappropriate for the FAA to speculate as to what the NTSB may determine to be the probable cause of the accident. The NTSB has already made several recommendations to the FAA from this accident, on issues including flight crew situational awareness, runway lighting requirements for operations at night, and controller vigilance and fatigue. They have made no recommendations regarding ground radar.

7. Why has a true public hearing, featuring sworn witnesses and a question and answer session for the general public, not been held regarding the Comair Flight 5191 accident in Lexington, KY, as have been held for airplane accidents in the past?

The FAA cannot provide an answer to this question, as it is properly a question that should be directed to the NTSB for a response.

Fuel Tank Safety Actions Related to NTSB Most Wanted Recommendations:

Since 1996 the FAA has implemented an extensive program to address fuel tank safety on transport airplanes and prevent future fuel tank explosions. We have implemented a balanced approach of fuel tank ignition prevention and flammability reduction.

- Initially the FAA focused on fuel tank ignition prevention.
  - Between 1996 and 2001, FAA issued 40 airworthiness directives (AD) to require design modifications and changes to airplane maintenance programs to prevent ignition sources, at a cost of over $99 million.
  - In May 2001, we issued the Fuel Tank Safety rule that required manufactures to review their designs and develop information to support ADs required by the reviews.
  - Based on those reviews, FAA has issued nearly 70 AD requiring further redesign or other action. In addition 10 AD have been issued to address ignition sources that were not found in the manufacturers' reviews, but have manifested themselves in operation, at a cost of $41 million.
  - The FAA currently has an additional 44 fuel tank related ADs in work (NPRM stage or NPRM being drafted) which could cost operators an additional $108 million.

- Late in 1997 the FAA began to focus on reducing fuel tank flammability.
  - In 1997, we began working with industry to identify a practical long term fuel tank flammability reduction means and to develop an interim short term operational procedure that could provide some decrease in the flammability exposure until a long term method could be incorporated
  - In 2000, FAA issued a Flight Standards Information Bulletin that recommended airlines use ground conditioned air, when available, during extended airplane ground times instead of using airplane air conditioning equipment that heats the center wing tanks on Boeing and Airbus airplanes.
  - In 2002, as a result of FAA research and development work, we developed a practical prototype on-board airplane fuel tank inerting system. This prototype proved that available technology that had been used for ground based nitrogen generation for food processing, etc, was now a practical method for on-board nitrogen based fuel tank flammability reduction means.
  - In November 2005 we issued the flammability reduction NPRM, titled "Reduction of Fuel Tank Flammability in Transport Category Airplanes." This proposed rule would require development and retrofit incorporation of design modifications for flammability reduction systems for large Boeing and Airbus airplanes in our fleet. The comment period for the NPRM closed in May 2006.
  - In July 2007, a final rule was submitted to the Department of Transportation, Office of the Secretary of Transportation, for review. We expect to issue the final rule by the end of this year.

Part 25 Icing Actions Related to NTSB Most Wanted Recommendations

Since 1994, the FAA taken numerous actions to ensure existing and future transport category airplanes can safely operate in icing conditions.

- The FAA has issued 41 Airworthiness Directives (AD) related to design and operation of ice protection systems on transport airplanes. The total estimated cost for operators to implement these AD is over $7.1 million.
    - Severe Icing. The FAA issued 19 AD for airplanes equipped with pneumatic deicing boots and unpowered roll controls, requiring the flight crew be provided with visual cues to determine when the airplane encounters severe icing conditions exceeding the capabilities of the airplane's ice protection equipment. The AD also require the flight crew to exit the severe icing conditions.
    - Timely Activation of Deicing Boots. The FAA issued 18 AD requiring activation of deicing boots at the first sign of ice accretion. One of the AD required operators of the EMB-120 to install an ice detector.
    - Inadequate Stall Warning in Icing. Based on service history, the FAA issued AD for the Cessna 560 requiring modified stall warning and Embraer EMB-120 requiring incorporation of system to provide low airspeed awareness in icing conditions.
- Roll Upset Evaluation
    - Between March 1995 and June 1997 the FAA evaluated Part 25 airplanes with designs that could be susceptible to uncommanded roll due to a ridge of ice, and are used in regularly scheduled passenger service. The evaluation found all these airplanes had acceptable roll control forces if a ridge of ice were to form aft of the protected areas of the wing and forward of the ailerons
- Rulemaking
    - July 2007 - Part 25 Performance and Handling Qualities in Icing Conditions. The FAA anticipates publishing a Part 25 final rule providing specific airplane performance and handling qualities requirements for flight in icing conditions.
    - April 2007 - Part 25 Activation of Ice Protection. The FAA published a Part 25 Notice of Proposed Rulemaking (NPRM) proposing requirements to ensure timely activation of ice protection systems (IPS). The proposed rule would require installation of an ice detector or activation of the IPS based on visible moisture and temperature.

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

MAR 1 3 2007

The Honorable Mark V. Rosenker
Chairman, National Transportation
Safety Board
490 L'Enfant Plaza East, SW.
Washington, DC 20594

Dear Mr. Rosenker:

This is in response to Safety Recommendations A-06-83 and -84 issued by the Board on December 12, 2006. These safety recommendations were issued as a result of an accident that occurred on August 27, 2006, involving a Bombardier CL-600-2B19 (CRJ-100), N431CA. The airplane crashed during takeoff from Blue Grass Airport (LEX), Lexington, Kentucky. The airplane had been cleared by air traffic control (ATC) for takeoff on runway 22, which is 7,003 feet long; however, the crew mistakenly taxied onto runway 26, which is 3,500 feet long, and attempted to take off. The airplane ran off the end of runway 26, impacted the airport perimeter fence and trees, and crashed. Of the 47 passengers and 3 crewmembers on board the airplane, 49 were killed, and 1 received serious injuries. The airplane was destroyed by impact forces and postcrash fire. The flight was operating under the provisions of 14 CFR Part 121 and was en route to Hartsfield-Jackson Atlanta International Airport, Atlanta, Georgia.

A-06-83. Require that all 14 Code of Federal Regulations Part 121 operators establish procedures requiring all crewmembers on the flight deck to positively confirm and cross-check the airplane's location at the assigned departure runway before crossing the hold-short line for takeoff.

FAA Comment. The Federal Aviation Administration agrees with the intent of this recommendation. While extensive guidance exists on this subject, which is a matter of fundamental airmanship, it is clear from this accident that this area requires renewed emphasis. Subsequent to the Lexington accident, the FAA issued a Safety Alert for Operators (SAFO) 06013, "Flight crew techniques and procedures that enhance pre-takeoff and takeoff safety," which addresses the central issue of this recommendation.

The FAA plans to issue another SAFO that will reach training managers and pilots operating under parts 91, 135, 121, and 125. The SAFO will recommend that directors of safety, directors of operations, trainers, and pilots develop and implement explicit standard operating procedures (SOP) to be contained in pilots' operating manuals, supported in their training, and practiced in daily operations. The SOP would apply when an airplane is holding short of a runway. The SOPs should exploit all systems available such as heading indicator, horizontal situational indicator (HSI), and flight management system (FMS), as applicable to the particular airplane, to show the most vivid confirmation possible of an airplane's actual position with respect to an assigned runway.

Despite the efforts at standardizing airport layouts, and markings and lighting, pavement configurations still exist that might cause a pilot to be confused in identifying the assigned runway. For this reason, the SAFO will emphasize the importance of making a final confirmation that the airplane is on the assigned runway once it has crossed the hold short line onto the runway. The SAFO will be issued by the end of March 2007.

In addition to the SAFO, the FAA will consider addressing this issue specifically in the Qualification Performance Standards, which will detail part 121 training requirements. These will be issued as appendices as part of the current part 121 subpart N and O rulemaking. The notice of proposed rulemaking is scheduled for publication this summer.

I will keep the Board informed of the FAA's progress on this safety recommendation.

A-06-84. Require that all 14 Code of Federal Regulations Part 121 operators provide specific guidance to pilots on the runway lighting requirements for takeoff operations at night.

FAA Comment. The FAA plans to issue an Information for Operators (InFO) that will reach directors of safety, directors of operations, trainers, and pilots in part 121 as well as those in parts 125, 135, and 91.

This InFO will make two points important in meeting the Board's safety concern, yet simple enough to be clearly understood by pilots operating under part 121 and easily applied in their daily flight operations:

1. **No runway lights, no takeoff at night.** Pilots operating under part 121 are limited to airports certificated under 14 CFR part 139. One of the elements of an airport compliant with part 139 is lighting authorized by the Administrator. That lighting is required for takeoff in part 121 operations at night.

2. **No takeoff on a Closed runway.** A part 121 certificate holder through its dispatch functions is required to make Notice to Airmens (NOTAMs) known to its pilots. Pilots should faithfully check NOTAMs for runway light outages and runway closures. No pilot shall conduct a takeoff on a runway NOTAMed Closed by the airport authority. If a NOTAM has not been issued, a pilot observing a runway lighting anomaly should make contact with the airport operator for a competent report on current conditions. Once a flight is cleared by

an aircraft dispatcher, the final Go or No-Go decision remains in the pilot's discretion.

Finally, the InFO will recommend that directors of safety, directors of operations, trainers, and pilots of certificate holders under part 121 collaborate to include these key points in their pilots' manuals and training programs, and to apply them in flight operations. This InFO will be issued by the end of March 2007.

I will keep the Board informed of the FAA's progress on this safety recommendation.

Sincerely,

Marion

Marion C. Blakey
Administrator

U.S. Department
of Transportation
**Federal Aviation
Administration**

SAFO

Safety Alert for Operators

SAFO 06013
DATE: 9/1/06

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest.

Subject: Flight crew techniques and procedures that enhance pre-takeoff and takeoff safety

Purpose: To provide techniques, procedures and items for consideration in training programs that emphasize safe operations in the pre-takeoff and takeoff phases of flight.

Background: The recent tragic accident of a commuter jet taking off from the wrong runway brings into sharp focus the importance of maintaining situational awareness and adherence to crew resource management procedures. It is important to note that many airports are involved in construction activities that result in changing environments. This heightens the importance of pilot vigilance.

There are many other factors that can distract a pilot and cause the loss of situational awareness. Even subtle distractions could demand a share of the pilot's workload, such as dealing with company procedures, passengers, running late and even personal issues.

It is imperative that flight crews maintain the highest levels of airmanship discipline and crew resource management. This is especially significant during the critical phases of flight, takeoff and landing. In this vein, this SAFO provides the following reminders:

Reminders of Existing FAA Aircraft Ground Operation Guidance:

- As part of preflight planning review airport layouts and know airport signage
- Review Notices to Airmen (NOTAMs) for information on runway/taxiway closures and construction areas
- During taxi operations have a current airport diagram readily available for reference and check the assigned taxi route against the diagram, paying special attention to any unique or complex intersections
- Write down complex taxi instructions. When unsure of the taxi route request progressive taxi instructions from ATC
- If the flight has more than one crewmember, it is important that both fully understand taxi clearances and runway assignments
- During taxi operations the pilots' maximum attention should be placed upon maintaining situational awareness. The pilot taxiing should have his attention focused outside the aircraft at all times while the other pilot should monitor the taxi progress by reference with the airport diagram and give guidance to the taxiing pilot.

- Apply crew resource management procedures to:
    - Identify and resolve conflicting perceptions of ATC instructions
    - Confirm, by using the challenge and response technique, proper execution of ATC instructions
    - Confirm, using the challenge and response technique, that the aircraft is actually positioned on the assigned runway by reference to the heading indicator
- Use all available resources to ensure the aircraft is positioned on the proper runway. One technique for airplanes that are FMS-equipped is to verbally announce that the proper runway and departure procedure are selected in the FMS and that the aircraft heading agrees with the assigned runway for takeoff.

This SAFO is to remind you that the following references contain excellent information for aircraft ground operations:

AC-120-74A, Parts 91, 121, 125 and 135 Flight Crew Procedures During Taxi Operations

AC120-71A, Standard Operating Procedures for Flight Deck Crewmembers

AC 120-51E Crew Resource Management Training

FAA Order 8430.17, Change 5, Paragraph 974 "Crewmember Procedures and Responsibilities During Ground Operations In All Weather Conditions"

FAA Takeoff Safety Training Aid, Pilot Guide to Takeoff Safety, available through the National Technical Information Service.

Recommended action: Directors of safety, directors of operations, trainers, and pilots of transport category airplanes should be familiar with the content of this SAFO. They should work together to ensure that the content of this SAFO is provided to pilots during ground training, and is reinforced in flight training, supervised operating experience, line checks and proficiency checks.

U.S. Department
of Transportation
**Federal Aviation
Administration**

SAFO

Safety Alert for Operators

SAFO 07003
DATE: 4/16/2007

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest.

Subject: Confirming the Takeoff Runway

Purpose: This SAFO emphasizes the importance of implementing standard operating procedures (SOPs) and training for flight crews to ensure that an airplane is at the desired takeoff runway, and to recommend some modern resources and procedures for doing so.

Background: Recently the crew of a commercial jet attempted a takeoff while on the wrong runway at Lexington, Kentucky, resulting in a fatal accident. This accident was one more in a history of takeoffs from the wrong runway or, in some cases, from a taxiway. In the past the NTSB and the FAA have recommended various procedures in an attempt to prevent such mistakes. Previously issued SAFO 06013 recommends a number of good operating practices to enhance pre-takeoff and takeoff safety.

Discussion: This SAFO expands upon information initially published in SAFO 06013, by taking particular note of modern resources not previously available to pilots when attempting to positively confirm and cross-check the takeoff runway. Some of these resources are in the airplane, others are not.

a. Horizontal Situation Indicator (HSI). One of the most vivid pictures available to pilots today is the HSI display in modern, electronic flight instrument system (EFIS)-equipped cockpits. When holding short and when in takeoff position, one pilot should select to the most expanded scale available on the HSI to confirm that the airplane is where the crew intends it to be.

b. Flight Management System (FMS). When in takeoff position, one pilot should verbally announce that the correct runway and departure procedure are selected in the FMS and that the airplane's heading agrees with the assigned runway for takeoff. Most "glass" (EFIS) airplanes display that FMS information on the HSI.

c. Air Traffic Control (ATC). A pilot may call upon ATC (ground control) for help in confirming position at any time during taxi or when holding short of a runway. At many U.S. airports, airport surveillance radar (ASR) is being supplemented by more precise ground

surveillance equipment, such as airport surface detection equipment (ASDE and ASDE-X) and airport movement area safety systems (AMASS). Help from ATC might be particularly valuable in conditions of reduced visibility.

The Golden Rule -- Use all available resources, old and new, to ensure your airplane is positioned correctly for the desired takeoff runway -- when holding short and when in takeoff position. The best SOPs may be a blend of proven old practices and new ones.

Recommended action: Directors of safety, directors of operations, fractional ownership program managers, trainers, and pilots should be familiar with the content of this SAFO. They should establish and implement aircraft-specific SOPs, supported by pilot training which exploits all available resources (including the most modern ones), in an effort to positively confirm and cross-check the takeoff runway and the airplane's location at the assigned departure runway before crossing the hold-short line for takeoff, and again once in takeoff position.

STATEMENT OF

CAPTAIN JOHN PRATER, PRESIDENT

AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

BEFORE

SUBCOMMITTEE ON AVIATION

COMMITTEE ON TRANSPORTATON AND INFRASTRUCTURE

UNITED STATES HOUSE OF REPRESENTATIVES

WASHINGTON, DC

JUNE 6, 2007

THE NATIONAL TRANSPORTATION SAFETY BOARD'S MOST WANTED AVIATION SAFETY IMPROVEMENTS

Air Line Pilots Association, International
1625 Massachusetts Avenue, NW
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STATEMENT OF
CAPTAIN JOHN PRATER, PRESIDENT
AIR LINE PILOTS ASSOCIATION, INTERNATIONAL

BEFORE THE

SUBCOMMITTEE ON AVIATION
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE
UNITED STATES HOUSE OF REPRESENTATIVES

ON

THE NATIONAL TRANSPORTATION SAFETY BOARD'S
MOST WANTED AVIATION SAFETY IMPROVEMENTS

JUNE 6, 2007

Good morning. I am John Prater, President of the Air Line Pilots Association, International (ALPA). ALPA is the world's largest pilot union, representing more than 60,000 pilots who fly for 40 airlines in the U.S. and Canada. ALPA was founded in 1931 and our motto since its beginning is "Schedule with Safety." For more than 75 years, ALPA has had a tremendous impact on improving aviation safety. Today, ALPA continues to be the world's leading aviation safety advocate, protecting the safety interests of our passengers, fellow crewmembers, and cargo around the world. ALPA has lived up to its mandate to the extent that many in the industry, including a former FAA Administrator, have referred to us as the "conscience of the airline industry."

We applaud the Committee for holding this hearing and appreciate this opportunity to testify about aviation safety improvements on the NTSB's "most wanted" list. ALPA enjoys an excellent relationship with the Board and we have collaborated for many years on numerous aviation safety issues including several contained on that list:

1. Reducing dangers to aircraft flying in icing conditions – Since the inception of the NTSB's original safety recommendations regarding flying in icing conditions and the FAA's initial actions, ALPA has been involved in all industry discussions and ARAC working groups tasked with developing rulemaking language. While we share the NTSB's frustration that 12+ years is a long time to affect design and certification process changes, progress is being made and consensus language is being developed by the industry. Since the Roselawn accident which prompted the NTSB's recommendations, there have been procedural, charting, and operational changes implemented in the industry to make flightcrews more aware of the environment in which they are operating and to improve how they operate their anti-/de-icing equipment should icing conditions

be encountered in flight. ALPA continues to monitor and participate in any and all discussions regarding flight in icing conditions.

2. Eliminate flammable fuel/air vapors in fuel tanks on transport category aircraft – Following the crash of TWA Flight 800, ALPA participated in the NTSB's accident investigation as an interested party. ALPA also became involved in the ARAC Fuel Tank Inerting Harmonization Working Group, which determined that although fuel tank inerting was a viable solution, the cost of its development and installation outweighed the safety benefit at that time. Since the issuance of the ARAC's report, the FAA has issued a performance-based NPRM for reduction of fuel tank flammability. While a final rule has yet to be issued, guidance has been implemented to reduce fuel tank flammability limits and potential ignition sources within the fuel tanks. In addition, manufacturers have developed and installed less costly systems with what appears to be highly promising flight test and operational results. These systems may eventually be installed on a portion of the existing fleet of aircraft used in commercial service as well as future aircraft.

3. Stop runway incursions/ground collisions of aircraft – ALPA has a long history of advocating for aircraft, airport, and training improvements designed to mitigate the threat of potentially deadly runway incursions. ALPA's Executive Central Air Safety Chairman, Capt. Terry McVenes, provided extensive testimony to this Committee in March regarding our recommendations for mitigating the risk of runway incursions.

Today, I would like to address three specific safety issues, the first of which is on the "most wanted" list, and the other two should be on the list, in our view:

1. The need for overhauling FAA's fatigue-enabling flight and duty rules,
2. The current state of pilot hiring and training, and
3. The invaluable, non-punitive, safety reporting system called the Aviation Safety Action Program (ASAP).

Pilot Fatigue – Flight Duty and Rest Rules Must be Changed

Fatigue is a present and growing problem within the airline industry. ALPA's own internal research indicates that fatigue has reached an alarming level among airline pilots. ALPA and the NTSB have – thus far without success – encouraged the FAA to modernize the flight and duty time regulations for all U.S. licensed commercial airlines to address pilot fatigue and to comply with the findings and principles of modern scientific research.

The present FAA flight duty and rest rules applicable to airline pilots are a dated patchwork of regulations that have been developed over the past fifty or sixty years. For example, the rules usually applied to air carrier cargo operations – the supplemental rules – were developed over 50 years ago for unscheduled freight operations using piston-powered aircraft. Many of these post-WWII vintage aircraft had unpressurized cabins, cruise speeds in the 200-knot range, and flight crews consisted of at least two pilots and often a flight engineer. In today's airliner fleet, manufacturers have used modern technology to decrease cockpit crew size and travel times and

to increase pilot and aircraft utilization. This increase in technology and reduction in staffing has put additional pressures on flight crews. As the overall system complexity continues to increase, the hazards associated with pilot fatigue in the industry also increase and are as great as they have ever been.

During the mid-1990's, a number of high-profile aircraft accidents attracted public and media attention to questions of aviation safety. In response to this public interest, the FAA Administrator helped direct the agency toward a regulatory system for commercial aviation based upon the principle of "One Level of Safety." In January 1995, former DOT Secretary Federico Pẽna convened an unprecedented aviation safety summit that brought together over 1,000 officials from government, airlines, airline labor, and other segments of the industry to establish joint priorities and strategies for enhancing aviation safety. These events led to the landmark FAA ruling on the "One Level of Safety" ("i.e., the Commuter Rule"). The Commuter Rule required all 14 CFR Part 135 operators to transition to 14 CFR Part 121 by March 20, 1997. This standard, which has been applied to large airlines and regional airlines (formerly known as "commuters") alike, has become one of the FAA's guiding regulatory principles during the last decade and has been a widely heralded success.

The FAA proposed to modernize the flight duty and rest regulations applicable to all airline pilots during the adoption process of the "Commuter Rule." The commuter airlines were permitted to continue to operate their turboprops under the existing FAA fatigue rules at that time pending the anticipated industry-wide reform. Industry, pilots, and the regulators were unable to reach a consensus and the industry-wide reform of the flight duty and rest regulations proposed in 1995 was never implemented. Because the anticipated rule changes never occurred, aircraft having 30 or fewer seats are still flying today under those less restrictive rules. Indeed, some airlines are currently forcing travelers back into these smaller aircraft to take advantage of the less restrictive pilot fatigue rules and lower cost. Over a decade later, the need for industry-wide reform in the FAA's flight duty and rest rules is still apparent. The NTSB's 2007 Most Wanted Transportation Safety Improvements includes "[s]et working hour limits for [pilots] based on fatigue research, circadian rhythms, and sleep and rest requirements." The current FAA rules do not adequately address fatigue research, circadian rhythms and realistic sleep and rest requirements as recommended by the NTSB. Reform of the FAA's outdated flight duty and rest rules is decades overdue and essential, given the desire by some to raise the mandatory retirement age to 65.

Domestic airline pilots – those that operate entirely within the continental United States – have a weekly flight time maximum of 30 hours. What is not widely understood is that the weekly flight time limitation for airline pilots does not include *any* of the considerable amounts of time pilots spend performing work on the ground for their employer. In reality, it is not unusual for airline pilots to work shifts approaching 15 hours per day to accomplish 7 to 8 hours, or less, of daily flight time. Moreover, the pilot's 7 or 8 hours of daily flight time may be spread out over 4 or 5 individual flight legs. Each of those flights has both pre- and post-flight duties, none of which count against the flight time limitations. *The domestic pilot's maximum working day limit, including flight time and ground based duty, is 16 hours under current FAA rules; that is simply too long.* Moreover, there is no limit to the number of times per month lengthy duty days may be

assigned – so long as the flight hour limits are not exceeded – increasing the potential for cumulative fatigue.

In the past, the negotiated work rules discussed above provided a significant measure of protection from such fatiguing schedules. Unfortunately, this layer of protection once provided to pilots and the flying public has been eroded as a result of the economic disruption in the airline industry during the past half-decade. Today's airline pilot is typically working substantially more hours for less money and spending more hours away from home than his or her predecessors.

Currently, airline pilots are routinely assigned a duty day up to 15 hours, followed by only an eight hour break, followed by another lengthy duty day. Unfortunately, this eight hour minimum break does not provide an adequate opportunity for recuperative sleep. *Let me be clear; the eight-hour break is not an opportunity for eight hours of sleep, but rather a period of time away from the aircraft. During the 8-hour break, it is not unusual for a pilot to be left with a maximum 4 or 5 hours per night sleep opportunity actually spent inside a hotel room.* This occurs because the FAA has determined that all time away from the airplane on a trip counts as "rest." Incredible as it may seem, the time a pilot spends waiting for a hotel shuttle and even the time spent going through airport security screening is defined as "rest" under the current FAA regulatory scheme. A pilot must also attend to all of his or her other non-work related daily physical needs and requirements during this 8-hour break away from the aircraft. It is not uncommon for a pilot to elect to forego a meal so as not to further reduce the maximum 4 or 5 hour actual sleep opportunity. This is unacceptable – pilots need a longer, and genuine, daily rest period.

Additionally, new aircraft types capable of long-haul operations in excess of 16 hours of continuous flight are being built, developed, and placed in service. This type of flying is done under the FAA international, or flag, rules across multiple time zones, with crossings of 12 to 14 time zones not uncommon. These flights result in pilots being on duty at a time when they would normally be asleep at home. Because of the length of these and many other international flights, additional pilots are required to be aboard the aircraft. It is critical that adequate onboard rest facilities are provided to pilots on these long-haul international routes. Traffic on existing international routes is increasing. The FAA flight duty rules applicable to international airline flying today are approaching 60 years old and were designed with the limited knowledge and vastly different operational needs of that bygone era. Scientifically based rules to address pilot fatigue in international long haul flying based on modern requirements and knowledge are urgently needed.

Fatigue is accumulating in our pilot work force. As such, ALPA agrees with the NTSB that there is a pressing need to provide rational, scientifically-based working hour limits for pilots engaged in all commercial airline operations. The weight of the scientific evidence over the last 20 or so years has firmly established that the vast majority of humans, including pilots, simply cannot be expected to reliably and safely perform operational tasks with the same degree of effectiveness as at the beginning of the shift, past a time on duty beyond 12 to 14 hours. *Recent aviation accident studies point to a statistically significant increase in the rate of accidents beyond 12 hours time on duty. Other studies show that 8 hours of time at the controls between*

required rest periods is the maximum period that one should normally be able to expect a rested pilot to perform reliably and safely. The NTSB and other accident investigation bodies are increasing the focus on fatigue as a factor in aviation accidents as well as in accidents in other modes of transportation. Additionally, scientific evidence continues to mount that the cumulative negative effects from disrupting a person's, circadian rhythm, i.e., the sleep-rest-wake cycle, have been grossly underestimated in the past.

When addressing possible revisions to the current flight duty and rest regulations, airlines and their pilots are immediately at cross-purposes. Managements are looking for more availability and "productivity" from flight crews. For flight crews, safety advocates and scientists, the question is often not whether to change the current rules, but rather *how much* to reduce the current maximum flight and duty limitations to enhance safety, raise human performance to acceptable levels, and reduce risk. Hence, the past approach of creating proposed regulations without the assistance of scientists and technical advisors, or reference to the technical literature, but rather upon notions of operational necessity, has failed. Needed are rules grounded in the results of scientifically based fatigue studies and safety reports.

In conclusion, pilots performing commercial flying duties must have regulations that provide them with an opportunity to get an adequate sleep period before each duty day of flying. This, combined with a scientifically determined maximum length duty day, including provisions for the type of flying accomplished, whether it be traditional short-haul, multiple sector flying or flights across multiple time zones, is mandatory to ensure that the U.S. air transportation system continues its envied record of aviation safety. We believe it is fully possible to implement needed regulatory changes that will adequately address safety needs and the issues related to pilot fatigue without negatively impacting the ability of the nation's air transportation to serve the needs of the public. ALPA stands ready to work with regulators and the industry to develop rules that will adequately address the problem of pilot fatigue.

Airline Pilot Hiring and Training

There have been extraordinary changes in the air transportation system during the past 10 years. We have seen the advent of advanced technology aircraft and flight decks, enhanced airport and aircraft security, and airspace and airport capacity enhancements such as Area Navigation (RNAV), Required Navigation Performance (RNP), Special Aircraft and Aircrew Authorization Required (SAAAR) approaches, Precision Radar Monitored approaches (PRM), Land and Hold Short Operations (LAHSO), and domestic Reduced Vertical Separation Minimum (RVSM).

Even today's most experienced airline pilots are challenged to maintain higher levels of situational awareness and cognitive abilities in a very crowded and complex operating environment. Given this circumstance, it would be logical to assume that airlines are raising the bar on hiring qualifications and employing seasoned aviators who are prepared to meet the challenge of airline flight in 2007. Ironically, just the opposite is true at numerous regional airlines which serve as the starting point for many pilots who later fly for the major airlines. Some regional carriers are actually lowering their experience requirements and are now hiring first officers to fly swept-wing jets who have as little as 200 hours of flight time. Even with such

miniscule experience requirements, one airline is offering a $5,000 signing bonus just to entice these low-time pilots to join the company.

Although it is well known that pilot hiring and furloughing occurs in cycles, there is an unprecedented, more deeply entrenched reason for the difficulty that airlines are now having in finding qualified pilots to fill available seats. That reason, simply put, is that the airline pilot profession is no longer viewed by many aspiring pilots as a "dream job," which rewards them with a satisfactory work environment and appropriate compensation. In some respects, airline jobs are now more of a "nightmare," given the bankruptcies, lost pensions, longer hours, salary cuts, and lost benefits that have followed in the wake of September 11, 2001. These factors are having a detrimental impact on our airlines' ability to attract qualified individuals to the piloting profession. As I noted previously, some airlines are recalling seven or more pilots on furlough for each pilot who actually returns to the airline.

The current pilot hiring difficulties translate into safety concerns, both here in the U.S. and abroad. Some of the problems that low-time pilots experience include:

- Difficulty communicating with ATC
- Poor aircraft handling skills
- Tendency to "fall behind" the aircraft making it difficult to keep the aircraft on the correct profile, at the correct speed, and configured appropriately
- Increased simulator time and increased operational evaluation time in the aircraft to serve as a required crewmember
- Below-average performance in learning to handle emergencies

It is disconcerting to put minimally qualified pilots with limited flight experience into the cockpit of commercial airliners. Traditional civilian and military training methods result in a pilot building several hundred hours of flight time in the process of obtaining their commercial, instrument and multi-engine pilot certificates. These pilots then acquire valuable flight hours and gain important flying experience while conducting military flights, flight instruction, or other general and corporate aviation jobs. It is not unusual today for the major airlines to require pilot applicants to have thousands of hours of flight experience.

In order to maintain our current level of safety, it is incumbent on our airlines and the FAA to ensure that U.S. airline pilots are the most qualified pilots in the world. New airline pilots who may not possess a great deal of actual aircraft experience must still be able to demonstrate the ability to fly safely in today's complex operational environment. Airlines and regulators must provide more training, checking, and ongoing monitoring of low-time pilots now than was required with more experienced airline pilot new-hires in the past.

High-Altitude Aircraft Performance Training

As a result of several NTSB recommendations contained in the Board's report on the Pinnacle Airlines Flight 3701 accident in Jefferson City, Missouri on October 14, 2004, the FAA formed an industry working group to address pilot training deficiencies in the area of high-altitude aircraft performance. During that ill-fated flight, the aircraft stick shaker and pusher activated at high altitude. The aircraft was equipped with a stick pusher to assist in the stall recovery.

However, it was discovered that the airline training provided to the crew regarding the stick pusher was inadequate. Their aircraft entered uncontrolled flight in a series of pitch oscillations, during which it lost 7,000 feet of altitude before the pilots were able to regain control. However, both engines flamed out and, due to a condition known as core lock; they were unable to be restarted.

The FAA/industry working group will develop high-altitude pilot training guidance to be incorporated at each airline. The guidance will address the regional airline training in this area for regional jets, but will go beyond that to provide guidance for all air transport category aircraft types.

The Multi-Crew Pilot License

Pilots in the United States have traditionally been trained through either the military or through various civil aviation training programs. For most of us, the seat in the airline cockpit was achieved by earning certificates, ratings, and then additional flight experience, either through the military or the civilian aviation arenas. It included acquiring hundreds, if not thousands, of hours of actual aircraft command experience before being hired by an airline and then successfully completing the initial aircraft qualification training that each airline requires of its new hire pilots before being allowed to serve as a member of the flight crew.

One program gaining in popularity is the *ab initio* program which accepts pilot candidates with little or no flying experience and trains them from the beginning to qualify for airline positions. Many of these *ab initio* programs are sponsored or supported by a particular airline, such as the Delta Connection Academy, and promise interviews and preferential hiring consideration to pilots successfully completing the course and acquiring the required flight experience. Though *ab initio* training represents only a small segment of flight training in the United States today, this may be changing. In Europe, where general aviation is much less prevalent, *ab initio* training programs are the norm, with airlines such as Lufthansa having successfully used them for decades to supply the qualified pilots needed to fly their airplanes.

Due to a forecast pilot shortage outside the U.S., notably in India and China, ICAO amended Annex 1 of the Convention on International Civil Aviation in November 2006 to give countries guidance on creating a new grade of pilot certificate called the Multi-crew Pilot License (MPL). The MPL training concept has its origins in *ab initio* training, but differs significantly by substituting extensive use of advanced simulation devices in the training program for most of the actual flight hours previously required to be obtained in an airplane. MPL is designed to shorten the time necessary to train a pilot to serve as a crewmember on a commercial airliner and put pilots onto flight decks more rapidly. While the FAA has not indicated that it plans to adopt this new licensing standard in the United States, Transport Canada and other civil aviation authorities around the world are in the process of preparing to certificate for the MPL.

MPL training programs will focus primarily on advanced turbo-jet aerodynamics, new aircraft technology, crew resource management (CRM) techniques and threat and error management

principles. In addition, candidates will be trained in aircraft-specific standard operating procedures, and irregular and emergency procedures.

The MPL will be a limited pilot certificate which will allow the holder to act as second-in command (SIC) in air transport operations of a turbine-powered, transport category aircraft which requires two or more pilots. The pilot will have instrument privileges as SIC and be type-rated as SIC in the aircraft for multi-crew operations only. The significant philosophical change with the MPL is that training is oriented toward creating a supporting pilot who will become an experienced aviator through on-the-job training, rather than a fully qualified and competent pilot who holds at least a commercial certificate with multi-engine and instrument ratings.

MPL pilots will receive a minimum of 240 hours of combined aircraft and simulator training experience. The MPL candidate must obtain only 35 hours in an actual airplane during the core-flying-skills phase of training, and 12 takeoffs and landings in the aircraft that the individual will be type-rated in during the final phase of the MPL course. These minimal hours can be further reduced if the program trains with a full-motion simulator. By comparison, a student pilot must have a minimum of 40 hours before applying for a private license. *Consider this – the MPL pilot will be licensed to fly as a first officer in a passenger-carrying jet, but will not be licensed to fly solo in a Cessna 172!*

There is not currently a pilot shortage in the U.S., but there is a shortage of experienced pilots willing to work in today's sub-optimal airline environment. ALPA has strong reservations about the MPL as a solution to any genuine pilot shortage which may arise here in the future. We urge Congress to monitor this situation closely, as we are. Regulatory oversight and a data-driven approach will be critical in ascertaining that those who graduate from MPL programs outside the U.S. do so with the knowledge and skills necessary to serve as safe and competent crewmembers of airline flight decks operating into the U.S.

Aviation Safety Action Programs Need Support

The Aviation Safety Action Program (ASAP) functions to provide voluntarily supplied safety information to be risk assessed and reviewed in order to identify safety problems, and implement appropriate mitigations to them. Air carrier employees are encouraged to voluntarily report safety information that may be critical to identifying potential precursors to accidents and incidents. Airlines, FAA, ALPA and other employee associations have endorsed this concept as an essential means of continually reducing the already low U.S. accident rate. ASAP is a principal component of the FAA's Safety Management System, which uses information in a predictive and proactive fashion, rather than a reactive one, to make continual safety improvements.

Under ASAP, safety issues are resolved through corrective action rather than through punishment or disciplinary action against the erring person(s). The program is based on a safety partnership between three parties: the FAA, the certificate holder, and employees. These three partners recommend, develop and insure the completion of the corrective action, whether it applies to reporting individuals, a company, or the FAA. ASAP provides incentives to encourage

employees to participate in the program and to disclose information, which may include possible violations of Federal Aviation Regulations, without fear of punitive enforcement sanctions by the FAA or company disciplinary action.

Each airline with an ASAP maintains a safety database in which all of the reported safety information is archived. This information is routinely reviewed by all parties to identify safety trends and to monitor the effectiveness of implemented corrective actions. ASAP allows an airline to conduct quality assurance from a safety perspective on all departments with operational responsibilities. It significantly enhances the FAA's oversight activities by giving their certificate management offices a more comprehensive view of the carrier's safety compliance posture. And it enhances flight crew community safety awareness by providing real-time safety incident information with recommended corrective actions.

The key elements of an ASAP programs are:

- Proactive safety problem identification and resolution
- Strong reporting incentives
- Association with NASA ASRS
- Airline and employee commitment, response and accountability
- Flight safety benefits to the traveling public, airlines, and crews

ASAP has value to an airline because it:

- Builds mutual trust through a cooperative safety relationship between FAA, airlines and employees
- Encourages preventive, rather than reactive, responses to identified safety problems
- Promotes cooperation and accountability between airline departments
- Establishes direct-line communication for important real-time safety information to airline managers
- Reveals a clearer, more accurate view of the safety of an airline's operations
- Complements Advanced Qualification Program (AQP), Crew Resource Management (CRM), Internal Safety Audits, Flight Operations Quality Assurance (FOQA) and Air Carrier Voluntary Self-Disclosure Programs
- Facilitates sharing of accident- and incident-prevention strategies industry wide
- Can promote FAA enforcement by ensuring compliance through corrective action

What an ASAP program IS:

- A proactive, corrective-action-based safety program.
- A program that requires an equal commitment by FAA, company and employees.

What an ASAP program IS NOT:

- An immunity program
- One that applies to deliberate acts
- One that applies to criminal acts

ASAP maximizes the input of the pilot community as an airline's most valuable safety resource, and it offers verifiable corrective actions for safety problem resolution and the prevention of

incidents and accidents. Additionally, flight crew feedback of safety information is essential for program success. The monitoring of flight crew reporting confirms the success of the implementation of safety enhancements.

Personnel who contribute reports to an ASAP may work in many areas, including but not limited to:

- Ground and flight operations
- Air traffic controllers
- Dispatch, load planning and aircraft performance
- Charting and instrument procedures
- Maintenance and MEL
- Human factors
- Technology and aircraft equipment

ASAP permits real-time solutions to potential flight safety hazards identified by line pilots with natural applications to training, CRM and line-flying procedures. As an example, one report received by a carrier concerned an aircraft which flew dangerously low during an instrument approach. The crew submitted an ASAP report, and because of their participation in the program, new procedures were put in place to prevent a re-occurrence. ASAP is also cost effective. Previously required legal, representational and investigative expenses can now be applied to corrective and safety initiatives. As an example of the potential for reporting, one of the major carriers received 106 ASAP reports in a two-month period. Only nine (9) of those reports were known to the carrier and five (5) to the FAA. Without ASAP, the remaining 97 reports would never have been submitted for fear of retribution.

Since the concepts of ASAP were first discussed in 1990, airline personnel and ALPA have been key partners with the FAA in the development and implementation of ASAP programs. This partnership approach was founded on the concept of shared values and trust between all of the parties and the realization that success would only come through cooperation and continuous program improvement. For the future, FAA and its industry partners must continue to support the implementation of non-punitive safety reporting programs. They are important tools which will help us continue to lower our already low accident rate. As part of this effort, the industry, with FAA support, must develop a safety data-sharing process, whereby the impact of safety problems can be identified and mitigated industry wide.

Some have criticized ASAP as being little more than an immunity program for pilots and other participating employees. Nothing could be further from the truth. In reality, ASAP works only when individuals demonstrate enough professionalism and accountability to admit having made a mistake and take responsibility for helping the industry learn from that mistake. It should be well understood by now that punishing individuals for making honest mistakes makes it much less likely that (1) the root cause of the problem will be discovered, and (2) employees will proactively report safety problems.

ASAP for Air Traffic Controllers

The FAA has been very supportive during the establishment of ASAP programs for airline operators and their employee groups. However, they have yet to make progress in the area of non-punitive reporting for their own air traffic controllers. A significant portion of safety related events involve actions by controllers, so pilot-identification of safety problems is at best a 50% solution. We have encouraged FAA on several recent occasions to expeditiously implement ASAP for ATC controllers.

I am pleased to report, therefore, that the Air Traffic Organization recently defined new policy supporting the concept of the Safety Management System, which includes a non-punitive reporting program for controllers. This will be an important advancement when it is implemented, because controllers will be able to report their errors to the agency and those reports will be used to improve procedures, processes, training, and equipment to make air traffic control safer. It will take leadership from FAA executive offices to ensure that this commitment is realized. We offer our support and assistance in making this a reality.

Thank you, again, for the opportunity to testify today. I would be pleased to address any questions that you may have.

# # #

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Mark V. Rosenker
Chairman

Testimony of Mark V. Rosenker
Chairman
National Transportation Safety Board
Before the
Committee on Transportation and Infrastructure
Subcommittee on Aviation
U.S. House of Representatives
June 6, 2007

Good morning Chairman Costello, Ranking Member Petri, and Members of the Subcommittee. Thank you for allowing me the opportunity to present testimony on behalf of the National Transportation Safety Board regarding the agency's Most Wanted list of Safety Improvements. It is my privilege to represent an agency that is dedicated to the safety of the traveling public.

As you know, the Safety Board is an independent Federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation. Since its inception in 1967, the Safety Board has investigated about 130,000 aviation accidents. To date, 4,704 recommendations have been issued to the Federal Aviation Administration (FAA) with an overall acceptance rate of 81.6%. Of those 4,704 recommendations, 2,802 have been closed acceptable action. Presently there are 376 open recommendations to the FAA; 97 of those are classified open unacceptable response. FAA's initial response time to Board-issued safety recommendations over the last 5 years typically takes 97 days.

The Most Wanted list of Safety Recommendations was initiated in 1990 as an additional way for the Safety Board to focus attention on a group of safety recommendations selected for intensive follow-up. The recommendations selected for the Most Wanted list would impact or enhance the safety of the national transportation system, receive a high level of public visibility and interest, and benefit from this special form of encouragement and heightened attention.

The 2007 list of Most Wanted safety improvements issued to the FAA currently includes the following desired actions:

- Reduce dangers to aircraft flying in icing conditions;
- Eliminate flammable fuel/air vapors in fuel tanks on transport category aircraft;
- Stop runway incursions/ground collisions of aircraft;
- Improve audio and data recorders/require video recorders;
- Reduce accidents and incidents caused by human fatigue; and
- Improve crew resource management.

I would now like to discuss in detail the objective, summary and status of each of the Safety Board's aviation recommendations currently on our Most Wanted list.

Reduce Dangers to Aircraft Flying in Icing Conditions

Objectives

- Use current research on freezing rain and large water droplets to revise the way aircraft are designed and approved for flight in icing conditions;

- Conduct additional research with the National Air and Space Administration (NASA) to identify realistic ice accumulations and incorporate new information into aircraft certification and pilot training requirements.

The 1994 in-flight icing encounter and subsequent loss of control and crash of a commuter airliner in Roselawn, Indiana, which claimed 68 lives, prompted the Safety Board to examine the issue of airframe structural icing and to conclude that the icing certification process has been inadequate because the process has not required manufacturers to demonstrate the airplane's flight handling and stall characteristics under a realistic range of adverse ice accretion/flight-handling conditions. The FAA did not have a systematic and proactive approach to the certification and operational issues of turbine-engine-driven transport-category airplane icing.

The consequences of operating an airplane in icing conditions without first having thoroughly demonstrated adequate handling/controllability characteristics in those conditions are sufficiently severe that they warrant a thorough certification test program, including application of revised standards for airplanes currently certificated for flight in icing conditions.

Summary

As a result of the Roselawn accident, the Safety Board called on the FAA to revise the icing criteria and icing testing requirements necessary for an airplane design to be approved within the United States, and the operational requirements that specify under what icing conditions it is permissible to operate an aircraft. Ten years ago, this work was referred to an Aviation Rulemaking Advisory Committee (ARAC) that provides input to the FAA on new regulations. The ARAC has recommended to the FAA changes to the design requirements for new airplanes to evaluate performance and handling characteristics in icing conditions. In March 2002, 6 years after it started this work, the ARAC approved a concept to revise the icing criteria in the design requirements for new airplanes.

Currently, there are five rulemaking activities in progress or needed concerning icing:

- A revision to Part 121, applicable to airplanes with takeoff weights less than 60,000 pounds, that addresses when to activate the ice protection system and when the flight crew should exit icing conditions.

- A revision to Part 25 that addresses when to activate the ice protection system (on April 26, 2007, the FAA issued this NPRM);

- A revision to Part 25 for evaluating airplane performance and handling characteristics in the icing conditions of Appendix C. The NPRM and Advisory Circular (AC) were published in the *Federal Register* on November 4, 2005;

- Development of Part 25 rules that include requirements to demonstrate that an airplane can safely operate in certain super-cooled large drop (SLD) conditions for an unrestricted time or can detect SLD and enable the flight crew to exit icing conditions and mixed-phase icing rulemaking; and

- Development of similar Part 23 rules after completing the Part 25 rulemaking.

Overall, the 5 projects the FAA has in progress are responsive to this recommendation, but the interminable delays are not considered acceptable by the Board. The planned date of June 2007 for issuance of the final rule and AC for Part 25 requirements related to performance and handling in icing conditions is welcome news of which the Board was not previously aware. More than 10 years after this recommendation was issued, the FAA finally received recommendations from the harmonization working group, and to date, the required regulatory analysis has not been completed, nor has an NPRM been prepared. In January 2003, the ARAC proposed revisions to Part 121 for activation of the ice protection system and exiting icing conditions. The FAA did not act on these ARAC recommendations due to other higher priority rulemaking projects, and their current response to Congress does not discuss any planned action in this regard. The FAA has taken no action on Part 121 regulations regarding when to exit icing conditions, and when to activate de-icing and anti-icing systems since 2000. The Safety Board continues to investigate icing accidents and incidents where activation of these systems and exiting the icing conditions were factors in the accident. The NPRM in 2005 was positive, but progress has been unacceptably slow.

Additionally, as a result of the Safety Board's investigation of the in-flight encounter with icing and subsequent uncontrolled collision with terrain of Comair flight 3272, an Embraer 120RT, near Monroe, Michigan, on January 9, 1997, in which all 29 persons onboard the airplane were killed, the Safety Board asked the FAA to review the icing certification of all turbopropeller-driven airplanes currently certificated for operation in icing conditions and to perform additional testing. On August 16, 2006, the FAA issued AC 20-73A, "Aircraft Ice Protection" which includes certification guidance relative to the effects and criticality of deicing boot intercycle and residual ice accumulations, and ice accumulations on unprotected surfaces aft of protected surfaces. The FAA and NASA conducted testing and research on these issues in 1999 and 2000, and stated to the Safety Board in September 2001 that additional testing and research were necessary to develop the needed guidance, and that it was developing and pursuing this research. In an October 26, 2005, letter, the FAA indicated that the revisions to the AC were based on the testing and research performed in 1999 and 2000. As part of its evaluation of the revised AC, the Safety Board has asked the FAA whether additional research and testing were conducted after the FAA's September 2001 letter.

The icing certification regulations and advisory material developed by the FAA are sufficiently developed to determine whether additional action is required for any turbo-propeller-driven airplanes currently certificated and in service. The FAA has stated that no unsafe

conditions exist that warrant actions beyond those that have already been completed or are in the process of being completed. The Board is concerned that the FAA has reached this conclusion based on a lack of accidents or serious incidents. During the 1990s, a number of accidents occurred involving airplanes that had passed the certification standards and for which the FAA believed there was no unsafe condition requiring action. Before another accident or serious incident occurs, the FAA should evaluate all existing turbo-propeller driven airplanes in service using the new information available, such as critical ice shapes and stall warning margins in icing conditions.

Actions Remaining

- Complete efforts to revise icing certification criteria, testing requirements, and restrictions on operations in icing conditions; and

- Evaluate all aircraft certified for flight in icing conditions using the new criteria and standards.

Eliminate Flammable Fuel/Air Vapors in Fuel Tanks on Transport-category Aircraft

Objective

- Implement design changes to eliminate the generation of flammable fuel/air vapors in all transport-category aircraft.

Center wing fuel tank explosions have resulted in 346 fatalities. Operating transport-category airplanes with flammable fuel/air vapors in fuel tanks presents an avoidable risk of explosion. A fuel tank design and certification philosophy that relies solely on the elimination of all ignition sources, while accepting the existence of fuel tank flammability, is fundamentally flawed because experience has demonstrated that all possible ignition sources cannot be predicted and reliably eliminated. As a result of the TWA 800 accident that occurred in July 1996, the Safety Board asked the FAA to address both long-term and short-term solutions to the fuel tank issue. Previously, fuel tank explosions occurred somewhere in the world approximately once every 52 months, but two explosions in the last 3 years have changed the average for the worse. In the 10 years since the TWA-800 accident, there have been three additional fuel tank explosions, illustrating the continuing need for reforms in this area.

Summary

In response to the long-term solution—preventing flammable fuel/air vapors in fuel tanks—the FAA commissioned the ARAC to evaluate design modifications, such as inerting, that would satisfy this recommendation. In its July 1998 final report, the ARAC concluded that inerting would achieve this goal, but at a cost of over $20 billion. The ARAC also concluded that inerting systems would be very difficult to retrofit into existing airplanes and recommended that the FAA continue to investigate a more cost-effective approach to reducing explosive

vapors. A 2001 followup study also concluded that the benefit of inerting could not be reasonably balanced by its cost. In May 2002, in contrast to the ARAC's reports, the FAA developed a prototype inerting system that required no moving parts, weighed less than 200 pounds, and could be retrofitted into existing airplanes at a fraction of the industry-estimated cost: the cost of this prototype system was only $100,000. The system has been flight tested by the FAA, NASA, Boeing, and Airbus, and the results indicate that fuel tank inerting is both practical and effective.

On December 9, 2003, the FAA published a Notice of Proposed Special Conditions (NPSC) for this system in Boeing 747s. A similar NPSC for Boeing 737s was published on June 15, 2005. While this system reduces flammability, rather than inerting the vapors, the reduction in flammability is substantial, and the Safety Board commends the FAA for developing and demonstrating this system. This is a major advancement in air safety. The Board is concerned that the FAA currently intends to use this system only for some, not all, fuel tanks on an aircraft, and not on cargo aircraft. This is a reduction in scope from what the Board recommended.

Although 10 years have passed since this recommendation was issued, the FAA's recent actions indicate positive movement, particularly in the development of a practical fuel tank inerting system. Boeing is making a flammability reduction system a basic feature in the design of the new 787 Dreamliner aircraft. Boeing has also designed a flammability reduction system and delivered these systems on production models of the 747 and 737 NG. The first B-737 equipped with a flammability reduction system was delivered on December 8, 2005, to Southwest Airlines. The next design to receive a flammability reduction system will be the B-777. The European Aviation Safety Agency (EASA) will certify the new Airbus A380 transport aircraft without a fuel tank inerting system, instead relying on minimizing ignition sources and maintaining the fuel tank temperature below the ignition point. Ironically, Airbus has been investigating the use of inerting systems for cargo compartments, rather than staying with the increasing cost of Halon fire protection, implying that Airbus sees the value of inerting systems. Both the Safety Board and the FAA submitted comments opposing the Airbus approach.

A notice of proposed rulemaking (NPRM) was published in the Federal Register on November 23, 2005 to require the installation of the flammability reduction system in commercial aircraft. The NPRM closed in May 2006, and we hope the FAA is drafting the final rule. In testimony before Congress on September 20, 2006, the FAA stated that a rule concerning flammability reduction means, although not specifically inerting, would be issued by the end of 2007.

Action Remaining

- Complete rulemaking efforts to preclude the operation of transport-category airplanes with flammable fuel/air vapors in the fuel tank on all aircraft

Stop Runway Incursions/Ground Collisions of Aircraft

Objective

- Give immediate warnings of probable collisions/incursions directly to flight crews in the cockpit

In March 1977, in what remains the world's deadliest aviation accident, two passenger jumbo jets collided on a runway at Tenerife, Canary Islands, causing the deaths of 583 passengers and crew. The deadliest U.S. runway incursion accident was a collision between a USAir 737 and a Skywest Metroliner commuter airplane at Los Angeles International Airport (LAX) in February 1991, which killed 34 people.

On January 5, 2007, a Frontier Airlines A319 passenger jet, and a Key Lime Air Fairchild Metroliner turbo-prop were involved in a near collision at Denver International Airport. The pilot of the Key Lime Metroliner inadvertently entered the runway while the Frontier A319 was on approach to the same runway. As the Frontier flight descended out of the clouds, the pilot noticed the Metroliner on the runway and executed a missed approach. The airplanes missed colliding by about 50 feet.

The runway incursion issue has been on the Safety Board's Most Wanted list since its inception in 1990. In the late 1980s, an inordinate number of runway incursions/ground collision accidents resulted in substantial loss of life, and the Board issued numerous safety recommendations addressing the issue. The FAA has since taken action to inform controllers of potential runway incursions, improve airport markings, and install the Airport Movement Area Safety System (AMASS) and Airport Surface Detection Equipment Model X (ASDE-X). These systems are an improvement, but are not sufficient as designed to prevent all runway incursions. The runway incursion rate in the United States has not appreciably changed over the past 4 years, and stands at about 5.2 runway incursions per 1,000,000 tower operations, despite these improvements.

Information needs to be provided directly to the flight crews as expeditiously as possible to prevent runway incursions. The issue is one of reaction time. Safety Board investigations have found that AMASS is not adequate to prevent serious runway collisions, because too much time is lost routing valuable information through air traffic control. After an AMASS alert, the controller must determine the nature of the problem, determine the location, identify the aircraft involved, and determine what action to take. Only after all of these determinations have been made can appropriate warnings or instructions be issued. The flight crew must then respond to the situation and take action. Simulations of AMASS performance using data from actual incursions show that alerts may occur as little as 8 to 11 seconds before a potential collision. In recent incidents, AMASS did not alert controllers in time to be effective, and the situations were instead resolved by flight crew actions that sometimes bordered on heroics or just plain luck.

Until there is a system in place to positively control ground movements of all aircraft with direct warning to pilots, the potential for this type of disaster will continue to be high.

Summary

In FY 2005, the FAA conducted a study to determine whether a direct warning capability to flight crews could be developed. A solution set with three technology levels was proposed and simulations were conducted in May 2005 to assess the proposal's effectiveness. Thirty-six commercial and general aviation pilots participated in simulations of 15 different incursion scenarios. The FAA found that a significant reduction of runway incursion risk was possible. The same year, the FAA initiated field tests of a Runway Status Lights system at the Dallas/Fort Worth International Airport. Initial test results have been promising and the FAA is performing additional testing to determine the extent to which this technology can be applied nationwide. In FY 2006, MITRE/CAASD, in conjunction with the FAA, was scheduled to coordinate the findings from the simulations with airports, pilots, representatives of other aviation user groups, and experts in runway safety technology. The FAA plans to explore alternative operational and system solutions to address shortcomings with the systems evaluated in the simulation study. The FAA also plans an analysis of a flight deck–based direct warning system.

The Safety Board has been favorably impressed by demonstrations of the technologies recently developed and tested. Although the Board has been encouraged by the progress, it has been 7 years since this recommendation was issued yet it has been only in the past 2 years that the FAA has started evaluating technologies that are responsive to the recommendation. Further, while these technologies may offer added safety by providing information directly to cockpit crews, they are many years away from possible national implementation.

Action Remaining

- Implement a safety system for ground movement that will ensure the safe movement of airplanes on the ground and provides direct warning capability to the flight crews

Since 1990, the FAA has made progress with lighting and signage at airports, but some basic improvements in air traffic control procedures are needed. For example, in 2000, the Board recommended that all runway crossings be authorized only by specific air traffic control clearance. Although this specific recommendation is not on our Most Wanted list, it bears mention because the Air Line Pilots Association stated they wanted this provision at the Board's recent Runway Incursion Forum; the Transportation Safety Board of Canada testified that they require it, and we have recommended it. Yet, the FAA has not implemented the recommendation.

Improve Audio and Data Recorders/Require Video Recorders

Objectives

- Require cockpit voice recorders to retain at least 2 hours of audio;

- Require back-up power sources so cockpit voice recorders are capable of collecting an additional 10 minutes of data when an aircraft's main power fails;
- Install video recorders in cockpits to give investigators more information to solve complex accidents;
- Install dual combination recorders; and
- Expand parameters recorded on Boeing 737 airplanes.

CVR/FDR Parameters and Operating Features

The lack of valuable cockpit information during the investigations of several aircraft accidents, including the crash of USAir flight 427, a Boeing 737 at Aliquippa, Pennsylvania, on September 8, 1994; the crash of USAir flight 105, a Boeing 737, on September 8, 1989, in Kansas City, Missouri; the crash of ValuJet flight 592 in the Florida Everglades shortly after takeoff from Miami International Airport on May 11, 1996; the SilkAir flight 185 crash on December 19, 1997; the crash of Swissair flight 111 on September 2, 1998; and the crash of EgyptAir flight 990 on October 31, 1999, prompted the Safety Board to issue several recommendations addressing specific improvements to CVRs and FDRs that are essential to accident investigation data collection and analysis.

On February 28, 2005, the FAA published an NPRM, "Revisions to CVRs and Digital FDR Rules." The NPRM comment period closed June 28, 2005. A year and a half after the comment period closed, the FAA is drafting a final rule that is expected to be published in July 2007. The NPRM proposed to increase the duration of CVR and FDR recordings, increase the sampling rate of certain FDR parameters, require physical separation of the FDR and CVR, require improved reliability of the CVR and FDR power source, and require the recording of data-link-communications. On April 29, 2005, the Safety Board provided comments to the docket for this NPRM. The Board stated that the NPRM contains positive actions that are responsive to several of its recommendations.

Two-Hour CVR

The Safety Board is pleased with the FAA's NPRM, in that it proposes to require that all CVRs record a minimum of 2 hours of audio information. The Board also endorses the timeline in the NPRM that requires all newly manufactured aircraft to be equipped with a 2-hour CVR within 2 years of the rule date, and a 4-year phase-in to retrofit the existing fleet.

Recorder Independent Power Supply (RIPS)

The NPRM proposes a requirement for the installation of a 10-minute independent power source for the CVR that will engage when electrical power to the CVR is lost. However, this requirement will apply only to newly manufactured aircraft. The Board believes that a 4-year retrofit similar to that being considered for the 30-minute-to-2-hour CVR conversion should also

be applied to RIPS. The benefits gained from a CVR independent power supply vastly outweigh the additional cost.

Separate Power for CVR and FDR

The NPRM is consistent with the Board's recommendation that the FDR and CVR be on separate generator busses with the highest reliable power so that any single electrical failure does not disable both. However, the proposed change applies only to newly manufactured aircraft, even though the recommendation was aimed at existing aircraft as well. The Board believes that any retrofit requirement will have minimal economic impact.

Several other Board recommendations, however, were not addressed by the proposed rulemaking. Among these rejected recommendations are several on the Most Wanted list, including the use of forward- and aft-mounted combination voice and data recorders.

Dual Combined FDR/CVR Recorders

The Safety Board takes exception to the FAA's NPRM, which states that, "After a careful analysis of the benefits of having two systems, the FAA is unable to justify the excessive cost that would be incurred in the installation of two complete systems." Although Safety Recommendations A-99-17 and A-00-31 specify two combined (CVR/FDR) recording systems, the intent of these recommendations was to have two redundant recorders—not to require two flight data acquisition units and two sets of cockpit microphones. The Board believes that the FAA's cost estimates are unnecessarily inflated. The Board also disagrees with the NPRM comment by FAA which states that "in the case of an accident so catastrophic that neither recorder survives [meaning the currently required, aft-mounted recorders], a second set of recorders located in the front of the aircraft would probably not survive either." In fact, there are a number of catastrophic accidents that could have resulted in a forward-mounted recorder surviving and the aft-mounted recorder being lost to fire or impact. Embraer is currently delivering its model EMB-170/190 to U.S. operators with forward-and-aft-mounted combined CVR/FDRs, and Boeing is also using a similar design in its new 787 aircraft.

The NPRM also does not address the Board's image recorder recommendations.

Video Recording - Small Aircraft

An image recording system would provide critical information to investigators about the actions inside the cockpit immediately before and during an accident on aircraft not required to have a CVR or FDR. Such systems, estimated to cost less than $8,000 installed, typically consist of a camera and microphone located in the cockpit to continuously record cockpit instrumentation, the outside viewing area, engine sounds, radio communications, and ambient cockpit sounds. As with conventional CVRs and FDRs, data from such a system is stored in a crash-protected unit to ensure survivability. Public Law 106-424, signed November 1, 2000, provides for withholding from public disclosure voice and video recorder information for all modes of transportation.

Video Recording - Large Aircraft

The Safety Board asked for the installation of cockpit image recorders in large transport aircraft to provide information that would supplement existing CVR and FDR data in accident investigations. This kind of additional information would have been extremely valuable in a number of important accident investigations, including ValuJet 592 near Miami, Silk Air 185 in Indonesia, Swissair 111 near Peggy's Cove, Nova Scotia, and EgyptAir 990. The RTCA Future Flight Data Collection Committee (FFDCC) considered the issue of video recording and concluded that this methodology would provide useful information to accident investigation, and that it was technologically feasible. The Committee did note concerns about the protection from disclosure outside of accident investigation, particularly for international flights. The Board's last reauthorization extended the protections that have long been in place for CVRs to now include image recorders.

Boeing 737 FDR Recommendations

The FAA's Febuary 2005 NPRM also did not address the Board's recommendations related to additional flight control parameters for Boeing 737 airplanes. However, on September 5, 2006, the FAA published a supplemental NPRM (SNPRM), "Revisions to Digital FDR Regulations for Boeing 737 Airplanes and for Part 125 Operators." The SNPRM seeks additional data and comments on the cost and feasibility of proposed changes to the parameters required to be recorded for Boeing 737 aircraft, and announces several decisions made by the FAA with regard to data that will be required. The Safety Board submitted comments on this SNPRM on October 18, 2006. The SNPRM announced that the FAA will not require the recordation of each rudder pedal force (4 sensors total), but rather will require a single rudder pedal force sensor located "midstream" in the rudder control system. The Safety Board has previously commented that the rudder pedal force exerted by each crew member is critical to loss of control problems on the B-737, and use of a single "midstream" rudder sensor cannot identify whether flightcrew control inputs are in opposition to each other or some other system anomaly forward of the sensor was responsible for the problem.

Actions Remaining

- Require the retrofit of existing aircraft CVR systems with RIPS;
- Require that for existing aircraft, the FDR and CVR be on separate generator busses with the highest reliable power so that any single electrical failure does not disable both;
- Require the installation of video recording systems in small and large aircraft; and
- Require the recording of additional needed FDR data for Boeing 737s.

As I mentioned earlier, the FAA completed the TSO on video recorders (a recommendation previously on the Most Wanted list) in 2006, but they are not going to encourage installation of video recorders; they will permit voluntary installation.

Reduce Accidents and Incidents Caused by Human Fatigue

Objective

- Set working hour limits for flight crews and aviation mechanics based on fatigue research, circadian rhythms, and sleep and rest requirements

Summary

The Safety Board has long been concerned about the issue of operator fatigue in transportation and has stressed its concerns in investigation reports issued throughout the 1970s and 1980s. In 1989, the Board issued three recommendations to the Secretary of Transportation calling for research, education, and revisions to existing regulations. These recommendations were added to the Board's Most Wanted list in 1990, and the issue of fatigue has remained on the Most Wanted list since then. The Safety Board's 1999 safety study of DOT efforts to address operator fatigue continued to show that this problem was widespread. Operating a vehicle without the operator's having adequate rest, in any mode of transportation, presents an unnecessary risk to the traveling public. The laws, rules, and regulations governing this aspect of transportation safety are archaic in many cases (aviation limits were addressed in the Civil Aeronautics Act of 1938 and the Federal Aviation Act of 1958) and are not adequate to address the problem.

Flight Crews

In December 1995, the FAA issued an NPRM to update the flight and duty regulations for airline pilots; however, in the intervening 11 years, the regulations have not been revised. The FAA has attempted on three occasions to reach consensus with the industry on a proposed rule but has not succeeded. FAA's ARAC upon reviewing Part 135 regulations has recently made some recommendations to simplify and improve the duty time regulations for flight crews covered by Part 135. The FAA recently advised the Safety Board that it is developing an NPRM that incorporates the ARAC's recommendations; the NPRM will include a fatigue risk management system that provides an alternative to prescriptive limitations.

The Safety Board recommended 13 years ago that the FAA close a loophole in the regulations regarding hours of duty for flight crews that allowed crews to be on duty flying for much longer periods of time than allowed under Part 121 or part 135. The 1995 NPRM proposed revisions that were responsive, however, those revisions resulted in considerable controversy and the FAA withdrew the NPRM. The Safety Board's concern that flight crew fatigue is a significant aviation safety issue continues today, yet little or no action has been taken by the FAA and they have not indicated any firm plans to take the recommended action.

Maintenance Personnel

In 1999, the FAA issued a report entitled *Study of Fatigue Factors Affecting Human Performance in Aviation Maintenance.* The FAA completed the first phase of the expanded study and issued a report in April 2000 entitled *Evaluation of Aviation Maintenance Working*

Environments, Fatigue, and Maintenance Errors/Accidents. The expanded study looked at multiple and combined environmental factors of temperature, noise, light, vibration, and sleep, which are known to accelerate fatigue onset, as well as the effects of lifestyle habits on fatigue and human performance. The study was designed to collect data in the aviation maintenance work environment on known factors that affect human fatigue and performance. The data were intended for use in predicting situations that are conducive to fatigue, accidents, incidents and errors.

The FAA's findings suggest that fatigue is an issue in this work force. Data from "mini-logger monitors" that recorded data from the selected parameters of light, noise levels, and temperature; activity monitors that monitored physical activity, sleep, and sleep quality; and the answers to background questions that employees were asked clearly indicate that sleep durations are inadequate to prevent fatigue. For most aviation maintenance technician specialties, 30-40 percent of respondents reported sleep durations of less than 6 hours, and 25 percent of respondents reported feeling fatigued or exhausted.

The DOT stated that the findings of its studies indicate that the extreme complexity of the issue of maintenance crew fatigue and duty time do not present appropriate material for regulatory activity, and education and training in fatigue management are the most appropriate actions for the FAA to sponsor and foster. The FAA has consequently conducted education and training activities on fatigue management for aircraft maintenance personnel. The Safety Board reviewed Advisory Circular (AC) 120-72, "*Maintenance Resource Management (MRM) Training,*" which seems to be the primary focus of the FAA's education and training initiatives related to fatigue among aviation maintenance crews. We found little in AC 120-72 that provides guidance on human fatigue in maintenance crews other than generalized warnings that attention to fatigue is important and should be considered in MRM Training. AC 120-72 contains little guidance as to how an employer should design a program to ensure that maintenance crews are not fatigued. In addition, the web site referenced in the reports to Congress (http://hfskyway.faa.gov) is in fact nothing more than a single page with a very general description of the FAA's aviation maintenance human factors research program. It contains no useful information to educate and train someone in the aviation community on the issues of fatigue management in aircraft maintenance personnel.

The Safety Board disagrees that regulating hours of service for aviation maintenance crews is not appropriate. In addition, the Board's reviews of the FAA's education activities related to limiting fatigue among maintenance crews shows them to be limited and of questionable value.

Action Remaining

- Issue regulations that establish scientifically based duty time limitations for air carrier maintenance personnel and flightcrews

Improve Crew Resource Management

Objective

- Require commuter and on-demand air taxi flight crews to receive crew resource management training

Summary

In April 2004, the FAA stated that the ARAC was reviewing Part 135 in many respects, including requiring CRM training for Part 135 operators. At that time, the FAA indicated that an NPRM for the Part 135 revisions, including requiring CRM training, was scheduled to be issued in fiscal year 2005. In June 2006, the FAA briefed Safety Board staff on its activities intended to lead to a requirement for CRM training for Part 135 on-demand flight crews. At that time, the FAA repeated that these requirements would be included as part of the comprehensive revisions to Part 135, and that an NPRM with the Part 135 revisions was scheduled to be issued by mid-2007.

To date, the NPRM has not been issued and the Board is concerned that the CRM revisions will be part of a comprehensive revision to part 135 that will be slow moving.

Action Remaining

- Implement a requirement for Part 135 on-demand operators to establish and implement a CRM training program in accordance with the CRM training requirements in part 121.

Conclusion

Let me say that the issues on our Most Wanted list tend to be those that are among the most complex and difficult to implement. While the FAA has made some progress, I am disappointed that there are so many recommendations on this list that are in an unacceptable status.

In closing, I would, however, like to mention those activities the FAA has responded to over the past five years:

With regard to the recommendations issued from the Air Midwest accident in Charlotte, North Carolina, the FAA substantially revised and improved weight and balance guidance and procedures. Following the Alaska Airlines accident, the lubrication procedure for the jackscrew assembly on DC-9/MD-80/90/B-717 was substantially revised and improved and this improved procedure is being required by the FAA. And inform the American 587 accident revised guidance to pilots to avoid full deflection, alternate rudder inputs and improve adverse attitude training has been issued. The Capstone project in Alaska, which is the basis for ADS-B, has been substantially completed, and has shown very good results. The requirement for TCAS has been extended to cargo aircraft; a TSO for a video recorder system was developed and issued; guidance to cabin and flight crews was issued on the need to aggressively fight in-flight fires and

that use of Halon fire extinguishers did not pose a serious safety risk; and FAA established an organization to review air traffic control incidents, which is independent of the Air Traffic Service.

This concludes my prepared statement and I will be happy to respond to any questions you may have.

Jul-09-07 10:49am From-NTSB 202-314-6110 T-484 P 002/006 F-720

National Transportation Safety Board
Washington, D.C. 20594

Office of the Chairman

July 3, 2007

Honorable Jerry F. Costello
Chairman
Aviation Subcommittee
Transportation and Infrastructure Committee
U.S. House of Representatives
2251 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Costello:

Thank you for your letter of June 26, 2007, transmitting questions from Congressman Ben Chandler for response from the National Transportation Safety Board (NTSB) regarding issues from your June 6th subcommittee hearing on "The NTSB's Most Wanted Aviation Safety Improvements."

Enclosed please find the NTSB's response to Congressman Chandler's request.

If you have any additional questions or concerns, please do not hesitate to call me at (202) 314-6035, or Ms. Brenda Yager, Director of Government and Industry Affairs, at (202) 314-6006.

Sincerely,

Mark V. Rosenker
Chairman

Enclosure

cc: Congressman Ben Chandler

QUESTIONS FOR THE RECORD
FROM CONGRESSMAN BEN CHANDLER
AVIATION SUBCOMMITTEE
TRANSPORTATION AND INFRASTRUCTURE COMMITTEE
"THE NATIONAL TRANSPORTATION SAFETY BOARD'S
MOST WANTED AVIATION SAFETY IMPROVEMENTS"
JUNE 6, 2007

QUESTION: The NTSB regards the FAA's response to runway incursions—one of the NTSB's ten most wanted safety improvements—as unacceptable due to the five-year delay from the time when NTSB made its recommendation until the time when the FAA started to evaluate technologies to mitigate runway incursions. To what extent do you believe this delay has negatively impacted air safety?

RESPONSE: Until there is a system in place to positively control ground movements of all aircraft with direct warning to pilots, the potential for a runway incursion disaster will continue to be high.

Every year, hundreds of runway incursions are reported at both large and small airports. Many of these could have been avoided or mitigated had some type of runway incursion prevention equipment been installed; but progress has been slow even on concepts that have performed well in testing. While the Airport Movement Area Safety System (AMASS) and Airport Surface Detection Equipment Model X (ASDE-X) are an improvement and have been deployed at major airports, hundreds of airports with scheduled passenger service have no potential ground movement safety system on the horizon. AMASS and ASDE-X are not sufficient as designed to prevent all runway incursions. Safety Board investigations have found that AMASS is not adequate because too much time is lost routing valuable information through air traffic control (ATC). After an AMASS alert, the controller must determine the nature of the problem, determine the location, identify the aircraft involved, and determine what action to take. Only after all these determinations have been made can appropriate warnings or instructions be issued. Simulations of AMASS performance using data show that alerts may occur as little as 8 to 11 seconds before a potential collision. In recent incidents, AMASS did not alert controllers in time to be effective and the situations were resolved by flight crew actions. Despite AMASS and ASDE-X, the runway incursion rate in the United States has not appreciably changed over the past 4 years, and stands at about 5.2 runway incursions per 1,000,000 tower operations.

The Federal Aviation Administration (FAA) has conducted successful testing at Dallas/Fort Worth Airport of runway status lights that directly warn pilots of potential hazards during surface operations; however, the system has not yet been approved for wider use. The Safety Board believes that information needs to be provided directly to the flight crews as expeditiously as possible and more rapid progress needs to be made in order to prevent a deadly accident.

QUESTION: Please comment on the adequacy of the FAA's response to the following NTSB safety recommendations from December 12, 2006:

- Require all 14 *Code of Federal Regulations* Part 121 operators establish procedures requiring all crewmembers on the flight deck to positively confirm and cross-check the airplane's location at the assigned departure runway before crossing the hold-short line for takeoff. [A-06-83]

- Require that all 14 *Code of Federal Regulations* Part 121 operators provide specific guidance to pilots on the runway lighting requirements for takeoff operations at night. [A-0684]

Additionally, would an inadequate FAA response have a real-world impact on the safety of air travel?

RESPONSE: These two recommendations were issued in December 2006, as a result of the Safety Board's investigation of Comair flight 5191 in Lexington, Kentucky on August 27, 2006. The FAA responded to these recommendations in March 2007 and the Safety Board will fully evaluate and classify the FAA's responses to these recommendations in the final accident report, which will be discussed at the Board Meeting that is scheduled for July 26, 2007. The classifications will be forwarded to you following the Board Meeting.

On September 1, 2006, the FAA issued Safety Alert for Operators (SAFO) 06013, "Flight crew techniques and procedures that enhance pre-takeoff and takeoff safety." More recently, on April 16, 2007, the FAA issued SAFO 07003, "Confirming the Takeoff Runway." SAFO 07003 recommends that airlines establish and implement aircraft-specific standard operating procedures, supported by pilot training, which use all available resources to positively confirm and cross-check the takeoff runway and the airplane's location at the assigned departure runway before crossing the hold-short line for takeoff, and again once in takeoff position. In addition to the SAFOs, the FAA stated that it would address Safety Recommendation A-06-83 as part of a rulemaking effort on Part 121, subparts N and O under Qualification Performance Standards.

A SAFO is an advisory guidance, and is not a mandate from the FAA. When Safety Recommendation A-06-83 was issued, the Board acknowledged SAFO 06013 and indicated that although the information in SAFO 06013 provided a summary of available FAA advisory information relevant to the circumstances of the Comair flight 5191 accident, the Board was concerned that SAFOs are not mandatory. The Board found several operators that had not established the recommended procedures and told the FAA to move beyond providing advisory information and become more aggressive in effecting change in this area.

In response to Safety Recommendation A-06-84, the FAA issued Information for Operators (InFO) message 07009, "Runway Lights Required For Night Takeoffs in Part 121." This InFO instructs operators that, while runway lighting varies among airports and among runways, every pilot must understand three key points: (1) if there are no runway lights, a pilot should not take off at night; (2) checking pertinent Notices to Airmen (NOTAMs) is a must, and takeoff is not permitted on a closed runway; and (3) a pilot must think beyond the NOTAMs. InFOs are advisories only; not requirements.

A positive response to these safety recommendations will have a real-world impact on the safety of air travel. In issuing these two recommendations, the Safety Board found that a number of Part 121 airline carriers did not have procedures for positively verifying that the airplane is aligned on the correct departure runway. In Safety Recommendation A-06-83, the Board stated that the recommended procedure would directly address the circumstances of the Comair flight 5191 accident as well as other events investigated by the Board involving parallel runways. Implementation of Safety Recommendation A-06-84 would eliminate inconsistencies that the Safety Board found among Part 121 operators regarding rules governing or prohibiting takeoff operations from an unlighted runway at night.

QUESTION: Ground radar supplies air traffic controllers with a better view of traffic during low visibility and periods of darkness. In your view, would the availability of ground radar have reduced the chances of the Comair Flight 5191 accident in Lexington, KY from happening?

RESPONSE: It is doubtful that a ground radar system by itself (that is, a system that only displays aircraft positions without associated safety logic processing) would have reduced the chances of the Lexington accident from occurring. When weather and visibility conditions permit, controllers rely primarily on visual observation of traffic and airport surface operations. At the time of the Lexington accident, the airport was reporting good visibility with a few clouds at 9,000 feet. A reenactment of the accident aircraft's taxi to the runway showed that the controller should have had no difficulty in visually monitoring the aircraft as it moved across the airport and on to either runway 22 or 26. When interviewed, the controller stated that he stopped monitoring the accident aircraft, turned around to face a center console, and began performing an administrative task. There is no reason to expect that the controller would have been any more attentive to a ground radar display.

However, the Safety Board has an open-unacceptable recommendation (A-00-66) asking the FAA to require, at all airports with scheduled passenger service, the provision of a ground movement safety system that will prevent runway incursions and provide a direct warning to flight crews. FAA has partially responded to this recommendation by deploying AMASS and ASDE-X ground movement safety systems at approximately 42 airports (eventually approximately 75 airports are scheduled to receive the equipment). In addition to displaying aircraft and vehicle positions, AMASS and ASDE-X both incorporate safety logic software and can detect situations such as an aircraft attempting to take off on a closed runway. Both systems also include an aural alert to attract the attention of controllers even when they are engaged in duties other than directly monitoring the display, although neither system provides a direct warning to flight crews. The Safety Board believes that its existing recommendation, if complied with, would result in the development and installation of effective ground movement safety systems at airports such as Lexington. Appropriate pilot and controller responses to the warnings provided by such a system could possibly have prevented this accident.

QUESTION: Lower density airports such as Lexington, KY and Charleston, WV have experienced air traffic controller staffing shortages. Recently, the manager at the Charleston, WV tower closed the tower due to staffing problems. Reports stated that as many as 18 aircraft

were moving on the airport during the period the tower was closed. To what degree does the NTSB support the closing of towers that normally provide air traffic services?

RESPONSE: The Safety Board has no current position on tower operating hours, except for a general belief that towers should be staffed, open and available when safety requires it. There are thousands of airports in the United States, of which only about 500 have control towers. Many of those towers are not open 24 hours a day because the traffic demand does not warrant it. Determining whether a tower closure is appropriate in a given situation requires examination of the facts and circumstances, but it would be dependent on more than just the number of operations during the hours of closure. The Safety Board does not believe that an airport without an operating control tower is inherently unsafe.

QUESTION: Why has a true public hearing, featuring sworn witnesses and a question and answer session for the general public, not been held regarding the Comair flight 5191 accident in Lexington, KY as have been held for airplane accidents in the past?

RESPONSE: The Safety Board conducts public hearings for the purpose of supplementing the facts discovered during the on-scene and subsequent follow-up investigation of an accident. One of the primary purposes of a public hearing is to collect information that will assist the Safety Board in its examination of the safety issues arising from the accident. This hearing involves Safety Board investigators, other parties to the investigation and expert witnesses called to testify. The technical panel often includes NTSB specialists in the areas of aircraft performance, powerplants, systems, structures, operations, ATC, weather, survival factors and human factors. Parties to the hearing include those persons, governmental agencies, companies and associations whose participation and special knowledge will contribute to the development of pertinent evidence. The public is not permitted to participate or ask questions during NTSB's public hearings. Public hearings are not conducted for every investigation. There were 3 public hearings held in 2006 and none so far in 2007.

In the Comair flight 5191 investigation, the Board determined that no sworn testimony or additional factual information was necessary, and thus decided not to convene a public hearing. The Safety Board's investigative staff were able to complete the fact-finding portion of this investigation and a technical review of the factual information was held in January 2007. At the conclusion of the technical review, all of the parties to the investigation and the Board Members agreed that all factual information necessary to complete this investigation had been developed. Since that time, the parties to the investigation have provided for the Safety Board's consideration their submissions on the accident. A Board Meeting under the Government in the Sunshine Act to publicly discuss the final report is currently scheduled for July 26, 2007. The Board Members and NTSB staff will discuss the report, and the Board Members will vote to accept, modify, or reject staff's proposed report. The public is invited to observe these deliberations, but will not be permitted to question staff or Board Members during the deliberative process. The final report will contain not only the facts of the accident, but the Safety Board's analysis, conclusions, probable cause determination and, most importantly, additional safety recommendations to prevent a similar tragedy. These recommendations will be released many months before they would have been if the Board had held a public hearing.

Amb. Edward W. Stimpson
Chairman

William R. Voss
President and CEO

Robert Vandel
Executive Vice President

Kenneth P. Quinn, Esq.
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STATEMENT OF WILLIAM R. VOSS, PRESIDENT AND CEO, FLIGHT SAFETY FOUNDATION

BEFORE THE COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,

SUBCOMMITTEE ON AVIATION,

ON JUNE 6, 2007

Chairman Costello, Congressman Petri and Members of the Subcommittee:

Thank you for the opportunity to appear before this committee and discuss aviation safety and the National Transportation Safety Board's Most Wanted Aviation Safety Improvements list. The Flight Safety Foundation appreciates the effort of the NTSB to raise awareness and try to inspire action through its expertise.

The Flight Safety Foundation was founded 60 years ago by leaders in the industry to address the problem of how to identify and solve safety issues. They believed that the industry needed a neutral ground where competitors could work together to share information, ideas and best practices for safety.

Our membership is over 1,100 and includes all segments of the aviation industry. We bring unions and management, regulators and operators, and rival manufacturers to the table so they can work together to find solutions. Moreover, the Foundation is nearly unique because of its international membership, which allows the many organizations that strive to improve flight safety standards and practices throughout the world to coordinate their efforts. Effectiveness in bridging cultural and political differences in the common cause of safety has earned the Foundation worldwide respect.

The one constant over the past 60 years has been the understanding that the industry *cannot* compete on *safety*. When there is a crash or a serious incident, the entire industry is affected, not just the particular airline or manufacturer. The air transport industry is a global enterprise — a single flight can cross the borders of several countries and continents. The Foundation, with members from 142 nations around the globe, transcends local, regional or national political interests.

Extraordinary Improvements in Aviation Safety Continue

Before beginning a discussion on improving safety in aviation, it is important to acknowledge how far this industry has come. If we had the same accident rate today as in 1996, there would have been 30 major commercial jet accidents last year. There were 11. That is a remarkable achievement, especially when considering that it is increasingly difficult to improve on a system

that is progressively safer, and continually growing. It is also remarkable to consider the number of lives that have been saved. To keep up that sort of progress, all of us in the aviation industry have to re-evaluate and challenge our approach to safety improvements.

Multiple Approaches Drive Increasing Safety Levels

The oldest and most venerable safety tool in aviation is the science of accident investigation. Accident investigations were basically the only source of safety improvements for several decades after World War II. The investigations identified causes and made findings and recommendations. The purpose of these recommendations was to avoid recurrence of accidents involving the same causes. This is what the NTSB does better than anyone in the world. Objective accident investigations will always be an essential part of the safety equation, but today they are only part of a more complex picture.

Today, aviation safety professionals have much more to work with than accident reports. They have adopted a more proactive safety management approach. They identify risk and prioritize actions by downloading and analyzing data from normal flights. They use reporting systems that allow pilots, mechanics and others to report problems that would normally go unrecorded or unrecognized. Studies show that this type of data will indicate several hundred anomalies that could be a factor in a serious accident or incident.

This information identifies latent risks and leads to proactive actions that drive risk down by making the system more resilient. We don't have to wait for a crash to act. When one risk is mitigated another rises to the surface and the process begins again.

Differing Perspectives Are Inevitable, But Continued Action Is Essential

One difficulty is that different approaches to safety can sometimes reach different conclusions. Accident investigators will urge that recommendations are followed so that the possibility of that particular type of accident recurring is minimized. Safety practitioners who are trying to balance the overall risk of the system will gladly follow these recommendations until data shows that there are higher risks elsewhere that need to be prioritized.

Neither viewpoint is wrong, because both types of input are necessary. Investigators must always tell us how to minimize the possibility of a crash. Safety professionals must always take this information seriously and use it together with all the other available information to target the things that are most likely to cause the next crash.

The Proactive Approach of Safety Management Is the Key to Meeting Future Safety Challenges

This new approach to safety saves lives by focusing attention on those items likely to cause the *next* crash. Accident investigations focus attention on what caused the *last* crash. In a safety management approach, information comes from monitoring the product of reporting programs built on a foundation of trust and commitment.

Safety management is now the main driver of aviation safety. It functions quietly in the background outside the view of the public and the press, but if it were to be compromised the consequences would be unbearable. We cannot go back to a time where lives had to be lost

before safety issues were revealed. We must develop and then *protect* systems that alert us to risks before the crash.

The Safety Management Approach Is Vital, But It Is Also Vulnerable

Proactive safety management is built on a foundation of commitment and trust. If we lose that trust, the information flow ceases and we are condemned to wait for the next incident or accident. Trust is a difficult thing to maintain in the U.S. aviation environment. The industry and the regulator have been through difficult times and labor relations are strained. The Flight Safety Foundation takes no position on the political debates, but we do issue one caution: the debates between management and labor in this industry must *never* be allowed to compromise the free flow of safety information in the system. If information stops flowing from the cockpit, the ramp or the control room floor, risk will be needlessly increased.

NTSB's Most Wanted List

The NTSB's Most Wanted List has always been a valuable tool to highlight the risks as seen by the dedicated and professional accident investigators. But we must never forget that there is more information to be considered than what comes from the crash site. The Flight Safety Foundation will attempt to comment on these items from the broader safety perspective.

Eliminate Flammable Fuel/Air Vapors in Fuel Tanks on Transport Category Aircraft

The Flight Safety Foundation has not been directly involved in this difficult safety challenge but can offer a general perspective. A great deal of effort has been invested in the management of potential ignition sources. This may not be the ultimate solution to the problem but these actions were clearly good as immediate responses to mitigate risk. These actions have been followed by longer-term efforts to develop fuel tank inerting technologies. Our understanding is that this will be followed by FAA rule making requiring operators to reduce flammability levels. We believe that this layered approach has reduced, and will continue to reduce, the risk associated with fuel tank explosions.

Reduce Dangers to Aircraft Flying in Icing Conditions

Aircraft icing has been a dangerous and challenging problem since the early days of aviation. The Flight Safety Foundation pioneered the design of deicing technologies in the 1940s and published a special issue of *Flight Safety Digest* in 1997 devoted to the topic. Sections of "Protection Against Icing: A Comprehensive Overview" are still being reprinted in various magazines ten years after publication.

In the early days of aviation, when the pilot hand-flew the aircraft with mechanical controls, it was easier for the pilot to sense when the aircraft's performance was being degraded by icing. In today's world, aircraft spend much of the time on autopilot, and many aircraft rely on fly-by-wire systems. This tends to isolate the pilot from feedback from the aircraft as ice accumulates. The result can be a sudden loss of control or an unexpected, dramatic performance degradation.

Proposed rules addressing pilot training, aircraft handling qualities, and installation of icing detection and alerting systems should greatly reduce the risk posed by this constant threat.

Stop Runway Incursions/Ground Collisions of Aircraft

While there have been relatively few fatalities associated with runway incursions, it is impossible to ignore the number of incidents that have been reported. The NTSB recommendation focuses largely on the implementation of technologies that warn the pilot directly. This is clearly a valid approach since runway incursions happen quickly and there is little time for a controller to interpret the situation and issue warnings.

However, it would be advisable to broaden the solution set to keep attention on pilot awareness and training. A tremendous amount of training material intended to reduce runway incursions has been produced and distributed around the world, but it is not being fully utilized. A major European regulator conducted a survey of pilots to see if the information was being used and discovered that only 8 percent of the pilots surveyed had seen any of the multitude of runway incursion material available. There is work to be done while we wait for the technology to be deployed.

The NTSB may also wish to reconsider the scope of this issue. Runway incursions are a subset of the larger problem of runway safety.

During January 2007, the Flight Safety Foundation called a meeting to assess the overall state of not just runway *incursions* but also the larger question of runway *safety*. In our work we break the problem of runway safety into three components: runway *incursions* such as at Tenerife, runway *excursions* such as Southwest Airlines in Chicago, Air France in Toronto and Garuda in Indonesia, and runway *confusion* such as Comair in Lexington, Kentucky.

One of the findings of this meeting is that runway excursions presented a much larger threat than most had assumed. The accidents do not often result in mass fatalities, and therefore, they often get less attention. Nonetheless, the data suggest these accidents deserve more attention.

Table 1

Runway Accidents 1995–2006
Resulting in Substantial or Greater Damage

	Number	Percent
Incursions	10	0.8
Excursions	374	29.4
Confusion	4	0.3

Note: Data based on 1,270 turbojet and turboprop accidents.

Table 2

Runway Accidents 2002–2006 Resulting in Fatalities

	Accidents	Fatalities	Percent of Fatalities
Incursions	3	17	0.4
Excursions	13	283	7.1
Confusion	1	49	1.2

Note: Based on analysis of 512 turbojet and turboprop accidents (including 134 fatal accidents resulting in 3,944 deaths).

The Flight Safety Foundation would be pleased to work with the NTSB in broadening this item to address the full spectrum of runway safety threats to include runway confusion and runway excursion.

Improve Audio and Data Recorders/Require Video Recorders

It is clear that the data retrieved from audio and data recorders (and potentially video recorders) play a central role in the investigation of an accident. What is less commonly known is that these devices are increasingly used to gather data on normal operations. Many major airlines, and some corporate operators, extract data from digital flight data recorders to provide information about safety risks. They are able to identify abnormalities such as non-stabilized approaches that could lead to landing accidents. Some airlines currently use this data to identify crew fatigue issues.

That being said, the use of recorder data to prevent accidents is not unlimited. Flight recorder data can be used to identify risks in normal operation because it can be de-identified. It is more difficult to de-identify voice and video recordings. For that reason, it is likely these tools will only be able to serve accident investigation and will not play as large a role in accident prevention. When regulating new requirements for these devices, it will be necessary to balance investment made in post-accident investigation tools against investments made in accident prevention training and technology.

At this point the FAA has introduced rule making that would target some of the most important flight recorder upgrades that could be implemented at reasonable costs. Attention should also be paid to how existing flight recorder systems are being maintained and used.

In a paper presented to the International Civil Aviation Organization (ICAO) during March 2006, the NTSB recalls that investigations into five of the seven major crashes of 2005 were hampered by poorly maintained flight data recorders. The NTSB went on to confirm that " … oversight regarding flight recorder maintenance continues to be a worldwide airworthiness concern during accident and incident investigations." Since 2006 the situation has only worsened. Developing States are not making the maintenance, or even the recovery, of flight data recorders a priority. The flight data recorder from the January 1, 2007 crash of Adam Air

574 still lies at the bottom of the ocean due the reluctance of the Indonesian government to pay for its recovery. The cause of that crash remains a mystery.

Flight data and voice recorders are essential to aviation safety. The U.S. Government should stress this point in appropriate international forums.

Reduce Accidents and Incidents Caused by Human Fatigue

In this area a broad consensus had developed, supported by mature science. Human error has long been identified as the leading cause of aviation incidents and accidents. Fatigue plays a major role in human error.

The aviation industry began setting hourly working limits for flight crews some three decades ago in an attempt to reduce the risk of fatigue. Addressing fatigue in aviation must include all sectors including the cockpit crew, cabin staff, maintenance personnel, air traffic controllers and ramp workers. A comprehensive program for these disciplines needs to include all factors that induce or increase fatigue.

Flight- and duty-time limitations and rest requirements traditionally have provided the regulatory basis for managing fatigue. The Flight Safety Foundation believes the best way to reduce fatigue among today's aviation workforce is through a non-prescriptive program which monitors fatigue. A system which goes beyond traditional flight- and duty-time regulations and incorporates a fatigue risk management system (FRMS) is essential for reducing the level of fatigue. FRMS provides alternative, scientifically based management of the risks associated with fatigue and can enable companies to safely conduct flight operations beyond existing prescriptive regulatory limits.

FRMS should be an integral part of a safety management system to ensure that employees' alertness and performance are not unacceptably reduced by fatigue. The purpose of an FRMS is to prevent errors, incidents and accidents in which to which fatigue contributes. FRMS is expected to improve safety, efficiency, productivity and operational flexibility while satisfying the company's duty of care to its employees as well as the regulator's to the public.

An effective FRMS would include a fatigue risk management policy, education and awareness training programs, a crew fatigue-reporting mechanism with associated feedback, procedures and measures for monitoring fatigue levels, procedures for reporting, investigating and recording incidents in which fatigue played a role, and processes for evaluating information on fatigue levels and fatigue-related incidents, implementing interventions and evaluating their effects.

FRMS, with appropriate regulatory oversight, should be considered an acceptable alternative to prescriptive flight- and duty-time limitations and rest requirements. For operators that choose this alternative means of regulatory compliance, the FRMS should become a required component of the safety management system.

Improve Crew Resource Management

In this area there is strong support from various segments of the aviation community. The recommendation supports introduction of crew resource management training into regulation

addressing the air charter industry. Crew resource management training is something that has been commonplace in the airline industry since the 1980s. Training providers that serve the corporate aviation community have voluntarily adopted it as well.

The original concepts of crew resource management training in the airline industry have evolved to include new concepts addressing Threat and Error Management (TEM). This addition gives the pilots strategies to manage risk as a team when problems and errors present themselves. This new TEM approach is actually the next generation of CRM.

The Corporate Advisory Committee of the Flight Safety Foundation is taking this training approach from the airline industry and moving forward aggressively. Efforts are under way to push this new type of training out to thousands of corporate pilots over the next year. Plans are also in progress to promote CRM and the new TEM training into the air charter community within the next few months.

A regulation that specifies CRM for air charter operators would be welcome. But it should not be a surprise if much of that industry has moved aggressively forward while such regulation is pending.

Conclusion

The aviation industry in the United States is in an enviable position. Through decades of work by the investigators, regulators, industry and other experts, the accident risk is one of the lowest in the world. This gives us all the opportunity and the luxury to dig deeper into the data from not only accidents and incidents, but also "successful flights," and begin to address risk at levels beyond what is done anywhere else in the world.

At the Flight Safety Foundation, we like to consider the people walking around today whose lives were unknowingly saved by the hard work of the investigators of the NTSB, the regulators at the FAA, and the experts in industry who are constantly making a safe industry even safer.

Thank you very much for allowing me this opportunity to testify before you today. I would be happy to take any questions.

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