

**THE CURRENT STATE OF THE CARGO INDUSTRY –
AN ALPA PERSPECTIVE**

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1. Introduction

In March of 2001, as a part of the investigation into the fatal crash of a McDonnell Douglas DC-8-71 cargo aircraft, the Air Line Pilots Association, International (ALPA) published a position paper calling for the National Transportation Safety Board (NTSB) to conduct a public hearing on the matter of cargo airline operations and safety. In that paper, ALPA provided preliminary factual substantiation that pointed towards the lengthy chronicle of cargo airline accidents in the United States that would provide significant background material for conducting such a hearing.

Historically, there has been little attention given to cargo airplane accidents. However, the air cargo industry has grown in scope and significance to individuals, businesses and the economy such that we can no longer ignore the “people dimension” of cargo. Cargo is not just boxes. Shipments of cargo contain not only peoples’ ordinary goods, which are important to them in their own right, but also contain things like medical supplies, biopsies awaiting testing, parts to keep businesses and factories open, large sums of money, etc. In short, the loss of a cargo aircraft has the potential to impact the lives of people in much the same way that the loss of a passenger aircraft does.

As the air cargo industry has grown, new cargo airlines have started operation, and existing ones have grown. They have experience the same “growing pains” any business does, especially in the airline industry. Some airlines have incorporated robust, state-of-the-art safety programs and practices into their growth, recognizing that safety is good business. However, for a variety of reasons, these programs and practices are not universally used throughout the industry. The NTSB has recognized the advantages of a joint government-industry discussion of critical safety issues in the air cargo industry and ALPA applauds the efforts of all participants in the Air Cargo Safety Forum to begin a dialogue that will allow us to identify these issues and develop strategies to address them.

Since 1984, the NTSB has conducted at least 38 accident investigations involving cargo operators. These investigations have resulted in numerous recommendations to the FAA and to cargo operators. However, success in identifying and mitigating the safety deficiencies of the cargo airline industry has been limited. In fact, a recent UK Civil Aviation Authority (CAA) study of worldwide fatal accidents for western-built jets between 1980 and 1996 concluded that “...cargo operations have a fatal accident risk at least four times that for passenger flights.” A more current study of aircraft accidents in the United States conducted by the Commercial Aviation Safety Team (CAST) shows that from 1994-2003, while the overall commercial aviation accident rate is extremely low, the accident rate for cargo operations rate is twice the

equivalent accident rate of passenger flights. CAST also pointed out that when relatively low risk events such as ramp, turbulence, runway incursions, etc. are excluded from the study, the accident rate rises to 5 times the accident rate for passenger operations. Yet, cargo airline operations account for only 7% of the total number of commercial operations.

While cargo and passenger airlines have many similarities, they also have some significant differences that may contribute to the higher cargo airline accident rate. Today we have both ends of the spectrum in terms of equipment being used by cargo airlines; everything from the brand new MD-11F to the very old DC-8 and 727F. Soon the new Airbus A380 will join the fleets of U.S. cargo carriers. While there are passenger airlines operating in the United States today that also employ older aircraft, there is a significant average age difference between the passenger and cargo airline fleets. As of January 2004, the average age of the U.S. cargo airline fleet is approximately 28 years, whereas the average age of the U.S. passenger fleet is approximately 7 years.

It is important to note that the FAA and industry have not ignored the incidents and accidents or the issue surrounding the cargo airline industry. In April 2000, the FAA formed a Cargo Strategic Planning Group to address the cargo-handling issues that relate to 14 CFR Part 121 and Part 135 passenger and all cargo operations. By collecting data, analyzing that data, and evaluating current cargo operations and regulatory requirements, the group developed an action plan. They issued recommendations, identified responsible organizations, and identified issues in certification, operations and maintenance. One of the outgrowths of this group will be the issuance of an FAA Advisory Circular (AC) for Air Cargo Operations. At this writing, industry has been advised that the AC will not be made available for public comment and is expected to be published in late 2004. This activity has provided some important first steps and ALPA applauds such efforts. However, by its very nature, an Advisory Circular is “advisory” only and in this case will offer recommendations and guidance on procedures for managing an air carrier’s cargo operation. The regulatory foundation on which the AC is based has not changed, and in many cases, no regulatory requirement exists for any of the recommended procedures in that Advisory Circular to be followed by an air carrier.

Several individuals and organizations representing cargo airlines have also been a part of CAST. These same individuals and organizations have endorsed the CAST process of data analysis of past accidents, identification of the safety enhancements that could have prevented those accidents, implementation of the most effective and feasible enhancements, measuring the results, and then repeating the process. Much of the data analysis and safety enhancement identification has now taken place. The data has identified the right things to do. It will be just as important for the cargo carriers to implement the safety enhancements that CAST has recommended as it will be for the passenger carriers.

While the FAA and industry have begun addressing some of the issues surrounding air cargo operations, there remains more to be done. The NTSB Air Cargo Safety Forum, for which this paper is written, is intended to identify safety issues in the industry that still require work, and to identify ways for government and industry to work together to address those issues. This paper will identify, from the point of view of the Air Line Pilots Association, International, issues that should remain the subject of robust discussion by the industry and the regulators.

2. Regulatory Certification

Although cargo airlines operate large, complex aircraft that are often variants of the passenger-carrying models, the FAA regulations governing the operations often differ, sometimes significantly, from those for passenger airlines. Some differences can be attributed to the unique character of cargo operations while others cannot. Differences that are not specifically intended to provide an equivalent level of safety to a unique operation can lead to higher risk in cargo operations than in similar passenger operations.

Cargo airlines frequently operate as “Supplemental” carriers under Part 121 of the Federal Aviation Regulations (FAR), while passenger airlines are normally operated as “Domestic” or “Flag” carriers. The FAR 121 Supplemental regulations are less restrictive than those of Domestic or Flag regulations in such diverse areas as flight time/duty time and alternate airports. Supplemental carriers can have longer flight and duty times. Domestic and Flag carriers are required to use flight dispatchers, which provided an important redundancy in the operational control of the flight, and therefore contribute to improved flight safety. Flight dispatchers are not required for Supplemental operators. Requirements for other safety-related elements such as weather reporting and alternate airport requirements are also less stringent under Supplemental regulations.

In addition to these Part 121 Supplemental differences, cargo aircraft are explicitly excluded from certain other requirements that apply to passenger aircraft. For example, cargo aircraft are exempt from requirements for certain critical safety equipment that is required on passenger aircraft, such as escape slides. Unlike for passenger aircraft, FAR Part 139, which applies to airport certification, permits cargo aircraft, which are likely loaded with hazardous materials, to operate into and out of an airport with no requirement for Airport Rescue and Fire Fighting (ARFF).

There are certain aspects of cargo airline operations that have a direct bearing on flight safety and are only peripherally addressed by regulations. For example, the personnel and organizations that are directly involved in the cargo preparation and loading are not required to be licensed and are subject to less stringent monitoring by the FAA. Additionally, cargo airlines also operate at many reliever and other less-frequented airports, where the airport safety-related facilities & infrastructure, such as lights and navigation aids are less developed or prevalent than at the major airports.

It is imperative that the regulations governing the cargo airline industry and the common practices used in the industry be reviewed, and where necessary, modified so that they provide “One Level of Safety” across the U.S. commercial air transportation system. The regulatory differences between cargo and passenger operators contribute to increased risk in the cargo industry, and likely to the higher cargo airline accident rates.

3. Equipment and Certification

The Federal Aviation Regulations on the design and certification of aircraft and aircraft equipment often do not provide a consistent “One Level of Safety” for passenger and cargo operations. Aircraft of the same type that operate in the same airspace at the same time can fall under different safety standards. These current standards result in a higher level of risk for aircraft and aircraft equipment used by cargo airlines relative to those of the passenger industry. Factors affecting that risk include the certification basis of the aircraft, the sophistication, capability and reliability of original aircraft systems and equipment, and the supportability of modifications to aircraft and equipment.

Many cargo aircraft began service as early-generation passenger aircraft. Though older aircraft are not inherently more or less safe simply because of their age, these aircraft were typically certificated to standards developed before many of today’s accepted safety standards were in place. Thus, they usually do not incorporate the safety improvements developed since their original certification. Significant safety improvements, especially those for design rules, are frequently not retroactive. A recent Emery Airlines DC-8 accident underscores this point. Had that aircraft been equipped with either of two design features required by FAR changes since the certification of the DC-8, it is likely that the accident would not have occurred.

By virtue of their age and passenger-aircraft heritage, many current cargo aircraft have had numerous post-delivery modifications such as the installation of large cargo doors and specialized cargo floors. Many of these changes were designed and accomplished by organizations other than the original aircraft manufacturer. Many of these companies are no longer in business, and technical, troubleshooting and parts support is difficult to obtain. This can adversely affect the continued airworthiness of aircraft and their components. Thin economic operating margins and strong competition for timely cargo delivery can lead to an operating environment in which aircraft are being flown in marginal and sometimes unairworthy condition.

Despite obvious operational differences such as the absence of a cabin crew and the more prevalent carriage of hazardous materials, there are some significant discrepancies between the fire suppression requirements for cargo and passenger aircraft. The FARs do not require the main decks of cargo aircraft to be equipped with active fire suppression systems, nor do they require sufficient access in a loaded aircraft for a crewmember to use or deploy a hand held fire extinguisher. As was previously mentioned, unlike their passenger carrying counterparts, cargo aircraft are not required to be equipped with escape slides to enable the crew and additional onboard personnel to evacuate the aircraft.

4. Qualification and Certification of loading personnel

Although cargo preparation and loading directly affect flight safety, the personnel and organizations responsible for this critical element are not required to be certificated or licensed by the FAA. Furthermore, the FAA requirements for training and qualification of these personnel and organizations are inadequate. Significantly, in its investigation of a 1997 DC-8 accident in Miami, the NTSB stated that the loaders were "not aware of the potentially catastrophic

consequences of misloading the airplane and failing to properly secure cargo." Other cargo aircraft accident investigations and safety audits in the industry have identified similar problems.

These cargo preparation and loading personnel are frequently not extensively trained, and in many cases, these jobs are minimum-wage, high-turnover positions. Many cargo loaders perform their jobs in adverse and demanding physical conditions, under high schedule-driven pressure. These circumstances increase the likelihood of errors, can result in increased risk, and sometimes aircraft accidents occur. Therefore, the development and effective use of standard operating procedures (SOPs) are crucial to flight safety.

Many cargo airlines outsource the cargo preparation and aircraft loading activities to private organizations not affiliated with the airline. Frequently, these airlines utilize different contractors at the various outstations the airlines serve. This often results in a lack of standardized operations and increased difficulty in ensuring the effectiveness of the procedures used. Other results include the airlines' reduced ability to maintain adequate operational control from a safety standpoint, and the FAA's increased difficulty in ensuring compliance with the SOPs and FARs.

Ensuring accurate loading is a cornerstone to the safety of cargo operations. There are several factors that compound the difficulty of reliable and accurate loading. In recognition of the criticality of proper loading, the U.S. military utilizes specially trained, personnel known as "loadmasters" who are specifically responsible for the accurate loading of their cargo aircraft. Few commercial cargo carriers employ this approach. The role that loadmasters play in the operation is no less critical than that of a flight dispatcher. Yet the FAA certifies and regulates dispatchers but neither requires nor certifies loadmasters.

5. Cargo Handling

Safe and efficient cargo movement relies on the actions of many organizations which may not even know of the others' existence. The actions of every person and organization that comes in contact with the cargo, from the time it is originally packaged to the time it is delivered, must be carefully coordinated. Problems in any step of the process can present hazards, some of which may not be detected until an incident or accident occurs. Many factors can influence the safety of cargo handling. These include: oversight and regulation of originating organizations, oversight and operational control of the loading/handling operations, outsourcing, turnover rate of qualified cargo personnel, improperly built-up pallets or loaded unit load devices (ULDs), operational constraints, schedule pressure, "cross-loading" operations, and weighing equipment.

The larger loads and increased exposure mean the potential severity of weight and balance errors is greater for cargo aircraft than passenger aircraft. However, there are no industry standards for scales used to measure the actual weight of cargo. There is an IATA standard for weighing scale accuracy, but there is no requirement to comply with it. Some carriers use the IATA standard, others use their own, which may or may not be similar. Some do not address the issue of weight accuracy at all. In addition, there is no standard to require periodic calibration of scales to ensure they remain within a given tolerance. Given that variation, the accuracy of the weight of cargo transferred from one airline to another will not be within any specific tolerance.

Consequently, the accuracy of gross weight and center-of-gravity calculations, both critical for safe operations, cannot be determined.

NTSB investigations and other evidence suggest that personnel involved in cargo handling, particularly at the point of loading, may not know that if they improperly load the cargo and/or incorrectly list the weight of a pallet, a serious incident or accident could result. The NTSB has examined many of these areas and made recommendations to prevent these conditions from reoccurring. Despite these recommendations, there remains a lack of adequate industry standards pertaining to load planning systems and to the qualifications, certification and training of ground personnel who handle cargo. Factors unique to cargo operations, such as generally greater cargo weight, oversized cargo, and the variety of containers available can compound the complexity of required tasks, and increase or exacerbate the possibility of errors.

Further education and training is needed in the handling of cargo destined to be carried on aircraft. Issues involving the supervision and training at many levels need to be addressed, including legal and oversight issues, and the consequences of the mishandling and incorrect loading of cargo. These hazards can be greater for “all cargo” operations than cargo placed on passenger aircraft. Several of the cargo carriers have developed excellent procedures to adequately address cargo handling. However, as we’ve seen in past accidents and incidents, the industry has not universally adapted a consistent methodology for cargo handling. By incorporating the industry’s “best practices” into universally used Standard Operating Procedures that address these issues, the overall level of industry risk will be reduced.

6. Ground And Flight Crew Qualifications And Training

Cargo air carrier accidents exceed those of passenger carrying accidents in both the takeoff and climb phases of flight. Many of these accidents have resulted from misloaded or shifting cargo that resulted in an airplane mistrimmed condition. The ability to prevent misloading or to successfully cope with a mistrimmed aircraft can frequently be traced to deficiencies in training of either ground or flight crew.

More needs to be done to reduce the risk of a serious mistrimmed condition due to improperly loaded cargo. The FAA did not satisfactorily address the NTSB’s recommendation that air carriers instruct flight crews on mistrim cues that might be available during taxi and initial takeoff. On March 12, 2001, the Board classified its recommendation as “Open Unacceptable Response,” and no further regulatory action has been taken. FAA and industry actions since do not adequately address the NTSB’s recommendation.

Flight crews are ultimately responsible for the safe conduct of any flight. In passenger operations, the flight crew has a cabin crew, and for some situations, the assistance of the passengers themselves to aid in identifying and correcting problems. Flight crews on cargo aircraft can quite literally be *solely* responsible for the identification and correct resolution of any safety issues occurring during flight. However, there is no requirement for flight crews of cargo airliners to receive any detailed or specialized training in dealing with cargo-unique problems arising during flight from loading, packaging, or handling cargo, including hazardous materials.

Simulators used to train cargo aircraft pilots are generally of limited value in training crews to cope with shifting cargo.

The prevention of cargo air carrier accidents caused by misloaded or shifting cargo will not improve unless we examine more thoroughly the reasons for these shortcomings. Further analysis into some of the systemic factors associated with training issues for ground and flight crews in the cargo airline industry is necessary. These include cargo handling, loading and flight training deficiencies. The industry also needs to address discontinuities between the Captain's responsibility and the Captain's authority over loading operations – the Captain bears the final responsibility to verify the aircraft is safe for flight, yet he or she has neither the training nor the direct authority over the loading personnel to ensure that loading is accomplished in accordance with safe operating practices, the adequacy of load planning documentation and the verification procedures. The current FAR training requirements for cargo pilots needs to be examined to determine their adequacy in addressing issues unique to cargo operations, including the best use of aircraft simulators to accomplish the intent of the NTSB's recommendation to address dangerously mistrimmed takeoff conditions.

7. Aircraft Aging

The aviation industry began aggressively working on solutions to the problem of aircraft structural aging several years ago and has made great strides to overcome that problem. However, some passenger operators have resolved their aging aircraft issues by selling older aircraft and buying new ones. Many of these aircraft are not removed from service, but are sold to other passenger operators, often carriers that are outside of FAA jurisdiction. These same aircraft may then be sold again for use as freighters by U.S. cargo operators. In addition to structural issues, there are other problems caused by aging such as outdated technology, higher part failure rates, lack of availability of replacement parts, and a decrease in support available from manufacturers. Although the problems of aging aircraft are not unique to the cargo carriers, they are more pronounced.

As noted above, many aircraft in cargo fleets have seen service in U.S. passenger airlines and foreign passenger airlines before moving to their present operators. Typically, such aircraft are less capable in terms of performance, reliability, and automation. In addition, older aircraft and their subsystems (e.g. avionics, engines, etc.) usually have higher failure rates and hence require higher levels of maintenance.

Many older aircraft and components are no longer produced and are no longer in widespread use. As a result, support by the airframe and component manufacturers is limited. Some of the original equipment manufacturers of these aircraft and components are no longer in business. Since many cargo operators purchase their aircraft and components from other airlines and not from the original manufacturers, even if the original manufacturer is still in business, there are weaker communication and business ties between these operators and the original manufacturers.

8. Aircraft Modifications, Support and Maintenance

As a result of the older aircraft fleets, cargo operators face many maintenance issues trying to adequately support their aircraft. The source of much of this complexity is the fact that many cargo aircraft were manufactured as passenger aircraft and have been modified from the original configuration to become freighters. Many cargo aircraft undergo numerous modifications and/or conversions prior to being put into cargo service. The aircraft condition and configuration can be significantly different than when the aircraft was produced and delivered.

Extensive modifications result in major variations in aircraft cockpits and systems on the same model aircraft. These modifications may be the result of specific requirements by the original purchaser, Supplemental Type Certificates (STCs) by subsequent owners, or conversions to make a passenger aircraft into a cargo aircraft. These changes can result in non-standard configurations and increase the complexity of both operations and regular maintenance. Similarly, record keeping and other accountability processes become more complex. As airlines grow and fleets expand, aircraft with the same original type certificate may be purchased, but these same-type aircraft may have been ordered by different carriers at different times and may have been through vastly different changes in ownership. This can result in significant differences in cockpit layout, installed equipment, and performance.

Because of the level of activity and schedule pressures, maintenance may often be deferred at the main hub. Thus, much maintenance is performed at outstations that may have limited resources. Outsourcing maintenance can result in the potential loss of two safety benefits: strong operational control and thorough familiarity with one's fleet. Language problems and long distances from parts supplies and company control can complicate maintenance done in other countries. As older mechanics retire, corporate knowledge is lost and it becomes more difficult to find people who can work on older systems. The decreased ability to repair or replace failed components results in many aircraft being repeatedly operated with multiple Deferred Maintenance Items or inoperative equipment.

The industry needs to acknowledge and address the unique maintenance challenges faced by air cargo operators. Maintenance practices and the oversight of those practices need to account for these unique aspects.

9. Flight Time and Duty Time

The present flight time and duty time rules applicable to cargo flying are a patchwork of domestic, supplemental and flag regulations developed over the past fifty years. The FAR Supplemental rules that are usually applied to cargo operations were developed decades ago, many for unpressurized piston operations with crews consisting of two pilots and a flight engineer. Carriers have used modern technology to increase pilot and aircraft utilization, which has put additional pressures on flight crews.

The current regulatory structure does not provide the same standards for cargo operations as for passenger operations, even if the only difference is the nature of the payload. As a result, some

safety deficiencies get addressed in collective bargaining agreements. However, dealing with deficiencies in this manner affects only a part of the industry and may not result in uniform treatment of the same issues across all carriers. They are subject to modification without the scrutiny and industry involvement afforded by the rulemaking process. The FAA last proposed to modernize the flight time/duty time regulations in 1995. That attempt stalled for a variety of reasons. The clear weight of scientific evidence supports the case that modernization of the flight time/duty time rules in the cargo industry is overdue, and needed to enhance safety.

There is a need for a unification of the passenger, cargo, and domestic and international flight time/duty time regulations to provide “One Level of Safety.” Certain basic rules should be established to provide a baseline for all operations. To maintain this ideal of “one level of safety,” certain unique aspects of cargo operations must be addressed by rules tailored to those operations. Some of the specific areas that are unique or predominant in cargo are fatigue and rest issues due to the non-scheduled nature of all-cargo operations and heavy assignment of back-side of the clock schedules; human factors introduced by non-standardized airport infrastructure, crew support and rest facilities, increased workload due to aging aircraft; and the use of FAR Part 91 ferry operations to position aircraft.

10. Hazardous Materials

Current regulations allow carriage of greater quantities of hazardous materials on cargo aircraft than on passenger aircraft. The hazards of carrying some substances are great enough that they may not be carried at all on passenger aircraft. However, such substances may be, and routinely are, shipped on cargo airliners. Thus, cargo aircraft consistently carry hazardous materials in greater quantities and containing materials judged more hazardous than are found on passenger carriers. Non-compliance with regulations and procedures therefore represents a more serious safety problem in the air cargo industry, since exposure to the risks is greater. The current regulatory and operational systems do not provide adequate safeguards to ensure the proper identification, packaging, and handling of these materials. Moreover, there are no requirements for any special health monitoring for cargo aircraft crews, in spite of the higher potential exposure rates to hazardous substances.

Undeclared, improperly packaged, improperly loaded hazardous materials and even shipments of material never authorized for shipment via air continues to be a problem. The additional quantities and more hazardous nature of these hazardous materials on cargo airliners further increase the risk from a leak or release. Public awareness and employee training are essential to eliminating this hazard.

Flight deck crews are an integral part of the “checks and balances” in ensuring safe operations. Crews must be informed of hazardous materials shipments. This must include timely notification and accurate information to ensure proper handling and placement of hazardous materials. In practice, schedule pressure frequently results in flight crews receiving a large volume of documentation without sufficient time to properly review it. In addition, there is no established requirement for procedures that ensure hazardous materials is properly identified from the time it is first packaged until it is loaded on an aircraft. The pilot in command only indicates he/she has

received the paperwork, a loader signs certifying that it has been loaded and there is no evidence of damage, but no one verifies the accuracy of the information.

11. Regulatory Compliance and Oversight

Regulatory compliance and FAA oversight to ensure such compliance are key elements in the safety of any airline operation. Many recent NTSB major aircraft accident reports discuss FAA oversight, and in most cases, problems with the oversight have been identified. While there are many reasons for oversight problems, there is no doubt that there are more difficulties associated with conducting oversight of cargo operators than there are for passenger operators.

The nature of the operation - moving packages instead of people - can lead some people to conclude that allocation of scarce resources should favor passenger carriers. Unique aspects of cargo airline operations present logistical difficulties not encountered in oversight of passenger operations. These include such factors as the concentration of night operations, the flexible route structure, often with hubs or destinations at more remotely located airports, including some with no passenger service, and the amount of cargo handling and aircraft maintenance activity that is outsourced to other organizations. These characteristics increase the workload, time and effort required by both the operator and the FAA to ensure compliance with standard operating procedures (SOPs) and the FARs, and adds to the burden of FAA offices, especially when they are understaffed or operating with other significant resource limitations.

This organizational and geographic diversity often results in the distribution of oversight responsibilities among multiple FAA offices for the same airline, which raises several issues. These include the inspectors' familiarity with cargo operations in general, the inspectors' familiarity with the operator or outsource organizations, and the potential for inconsistent application of rules. Clearly, additional effort must be expended to ensure the completeness and continuity of the oversight function.

The air cargo industry is more subject to oversight by multiple regulatory agencies than the passenger industry. For air cargo, these agencies include at least the FAA, the Research and Special Programs Administration (RSPA), and the Occupational Safety and Health Administration (OSHA). This complicates the operators' and regulators' ability to ensure compliance. Ideally, these organizations should coordinate their activity to ensure that, from both a regulatory and oversight standpoint, all aspects of the operation are considered, with minimal overlap. Furthermore, the system of multiple regulatory agencies raises the possibility of 'jurisdictional creep', a condition where one of the regulating agencies inappropriately expands its scope into the purview of another regulating agency. This has the potential to result in inappropriate or ineffective regulation, oversight and compliance.

12. Safety Culture

A core fundamental business practice of any company must be a well defined corporate safety culture. An organization with a strong safety culture views safety as something that influences

everything the company does. A strong safety culture is specific, it is deliberate and it is learned. This can be the primary tool that a company has to combat accidents and incidents and then consequently positively affect the profitability of an organization.

A clue to the strength of an airline's safety culture can be determined in observing where its safety department sits in the company's organizational chart and to whom its chief safety officer reports. Some airlines bury their safety department deep in the organizational structure so that safety issues get filtered to the Chief Executive Officer through several layers of management. An airline that views safety as a core fundamental business practice will have their safety department reporting directly to the CEO.

An airline with a strong safety culture must establish clear safety goals for their organization that recognizes the fact that safety is good business and thus has a business plan that maximizes both profit and safety. In order to achieve safety goals, there are some essential initiatives and programs that have been developed and endorsed by the FAA, many airlines, and their associated labor organizations. Voluntary reporting systems that provide a means for front line personnel to identify safety deficiencies so that corrective action can be taken to correct them form the foundation of the safety culture at many airlines. Other programs such as the Flight Operations Quality Assurance Program (FOQA), the Aviation Safety Action Program (ASAP), and Line Oriented Safety Audits (LOSA) have also been implemented throughout the industry.

Today's cargo industry is made up of a wide range of operators from the small "mom and pop" operation to the large carriers operating hundreds of modern jets all over the world. To assess the entire industry's safety culture and attempt to paint all cargo carriers with a broad brush would be both impractical and unfair. However, there is a strong disparity in the number of safety programs and initiatives that have been implemented at passenger carriers as compared to cargo carriers. For example, in the U.S. there are twelve airlines with operating FOQA programs, of which only one is a cargo operator. Of the 32 ASAP programs in operation, only four are at cargo carriers. LOSA audits have been conducted at 16 airlines but not a single cargo carrier has participated in this program.

All airlines need to have a strong safety culture that considers risk management as an integral part of their operations. The type of safety programs and initiatives incorporated into an airline's operation are one measure of the quality of that safety culture. These disparities in safety programs between passenger and cargo carriers are significant and contribute to the some of the safety deficiencies between the two groups.

13. Conclusions

Today a passenger carrier and a cargo carrier can be seen operating the same airplane type, operating in the same airspace and into the same airport. Yet because one airplane is carrying passengers and the other cargo, often the airline and its flight crews are operating under different regulatory requirements and thus to different safety standards. Clearly, there are unique aspects to cargo operations, and these unique aspects may justify standards that differ from their passenger counterparts. However, there should be nothing in the operations, regulations, certification, or training of personnel that allows greater risk in one operation than another based on the aircraft's payload.

Some of the safety issues identified in this paper are unique to operating a freight airline. Others have application to both cargo and passenger operations, and their study may well serve to decrease risk in both arenas. It is important as the regulators and industry analyze and discuss the issues, that those hazards that are not limited strictly to cargo operations not be dismissed with the observation that "the same problem exists for passenger operators." Similarly, we must not fall into the trap of assuming a risk is acceptable simply because it is limited to one segment of commercial aviation: cargo operations. As has been discussed in this and other papers prepared for the NTSB Air Cargo Safety Forum, cargo operations have the potential to impact individuals, businesses, the worldwide economy, and society at large in a significant way. We find ourselves in a time when this industry simply cannot afford to dedicate resources to anything that does not maintain or increase the level of safety while improving our ability to deliver cargo and passengers reliably and efficiently. Given the extreme resource constraints we all face, it is more important than ever before that industry and government work together to identify hazards and develop effective, efficient mitigation strategies. The hazard mitigations we develop throughout the entire aviation industry must ultimately be implementable in the real world in order to have any positive impact on the industry. Therefore we must also consider the feasibility and return on investment, which may well be different for some fleets and operations than others.

While the FAA and industry have made significant progress in attempting to mitigate many of the hazards that have been identified through the analysis of past accidents and incidents in the cargo industry, it is important that more study, discussion and positive change be continued. Recognition of the issues, developing action plans, and issuing Advisory Circulars are a good place to start, but they will not solve all of the problems the cargo industry faces. We must continue to strive toward a commercial air transportation system in which people and their belongings, as well as the flight crews operating every aircraft in the system, are equally protected by a single high level of safety.