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Docket #
01-10910

THOMAS R. DEVINE
(202) 835-8096

September 3, 1996

Docket Clerk
Rules Docket (AGC-10)
Federal Aviation Administration
800 Independence Avenue
Washington, D.C. 20591

Dear Sir or Madam:

Enclosed for filing in duplicate is the Independent Pilots Association's Petition for Rulemaking to Amend FAR §121.356 to Require TCAS II on Transport Category Airplanes Flown in All-Cargo Operations and a Summary of the Petition, as required by FAR §11.25. Please docket this Petition and send it to the appropriate offices within the FAA for processing. Thank you for your assistance in this matter.

Sincerely,

Thomas R. Devine

Thomas R. Devine
Counsel for
Independent Pilots Association

Petition for rulemaking on collision avoidance

Q49047-1

BEFORE THE
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Petition for Rulemaking to Amend 14 CFR §121.356 to Require TCAS II on Transport Category Airplanes Flown in All-Cargo Operations	)	**Rules Docket No. _____**

PETITION OF THE INDEPENDENT PILOTS ASSOCIATION (IPA) FOR RULEMAKING TO AMEND 14 CFR §121.356 TO REQUIRE TCAS II ON TRANSPORT CATEGORY AIRPLANES FLOWN IN ALL-CARGO OPERATIONS

The Independent Pilots Association (IPA), which represents over 2000 pilots who fly for United Parcel Service (UPS), hereby petitions the Federal Aviation Administration (FAA), pursuant to 14 CFR. § 11.25 (Federal Aviation Regulation (FAR) §11.25), to amend 14 CFR § 121.356 (FAR §121.356) to require transport category airplanes -- such as B-727's, B-747's, B-757's, B-767's, DC-8's, DC-10's and MD-11's -- flown in all-cargo operations in the airspace of the United States to be equipped with a Traffic Alert and Collision Avoidance System (TCAS II), the same as other transport category airplanes. The specific amendment IPA seeks through this petition for rulemaking is to revise 14 CFR §121.356 (FAR §121.356) as follows:

Redesignate subsection (a) as paragraph (a)(1), and add new paragraph (a)(2) to read as follows:

> (a)(2) Unless otherwise authorized by the Administrator, each certificate holder operating a transport category airplane in all-cargo operations, shall equip its airplanes with an approved TCAS II traffic alert and collision avoidance system and the appropriate class of Mode S transponder according to the following schedule:
>
> | **Date** | **Required Equipage** |
> |---|---|
> | July 31, 1998 | 50% of all covered airplanes. |
> | December 30, 1998 | 100% of all covered airplanes. |

STATEMENT OF INTEREST OF PETITIONER IPA

As the union representing pilots flying for one of the world's largest cargo carriers that serves over 80 airports, IPA has a profound interest in aviation safety matters in general, and particularly in the requirements for equipping cargo planes with appropriate collision avoidance systems. Our reasons for petitioning for a rule mandating that cargo planes be equipped with a proven, effective means of preventing midair collisions with other aircraft are simple--our health, safety, and lives are at risk. While IPA does not believe that the federal government should value the lives of pilots more highly than those of any other citizens, we clearly believe that our lives should not be valued any less than the lives of others. We also have a deep sense of responsibility for the multi-million dollar aircraft we fly, for the cargo shipped by UPS customers, and for the safety of the residents, workers, and others who populate the areas we fly over.

INFORMATION, VIEWS AND ARGUMENTS IN SUPPORT OF PETITION

The Public Interest in Saving Lives Would be Served by Granting the Petition

TCAS has a proven track record in reducing the risk of midair collisions. The FAA's Program Manager for TCAS has been quoted in the press as stating that pilots have reported approximately 50 instances in which they concluded that TCAS has helped prevent accidents. As recently as June 25, 1996, TCAS II appears to have averted a potential collision between a Virgin Atlantic plane and a TWA plane over the Atlantic Ocean. In its quarterly reports to Congress on progress in developing and certifying TCAS (as required by Section 203 of the Airport and Airway Safety and Capacity Expansion Act of 1987) the FAA has routinely stated that "[t]he analysis of the

data collection by the [TCAS Transition Program] TTP indicates that TCAS operation is providing an additional margin of safety against midair collisions." *See*, e.g., *Letters from FAA Administrator David R. Hinson, dated September 26, 1994, to the President of the Senate and the Speaker of the House.*

In the February 17, 1995 Report to Congress, the FAA Administrator stated:

> A recent example of the value of TCAS was demonstrated by an incident involving the U.S. Coast Guard. The Coast Guard reported that a helicopter had communications with the tower and was on downwind at 1500 feet for a visual flight rules (VFR) entry to land at Opa-Locka Airport (Miami) when the crew received a TCAS "traffic advisory." The crew immediately looked for the traffic, but did not see it. Approximately 5 seconds later, they heard the TCAS "resolution advisory" directing them to "climb, climb now." The pilot flying the right seat, immediately executed a TCAS climb. Several seconds later, the copilot (left seat) spotted a Cessna 172 approximately 200 feet below at the 10 o'clock position. The Cessna continued under the Coast Guard aircraft and exited at the 3 o'clock position.
>
> The commanding officer stated, "This incident is representative of numerous other TCAS success stories. TCAS is a fantastic tool that enhances situational awareness and helps aircrews to see and avoid other aircraft. The traffic depiction with relative altitude is invaluable. If possible, TCAS II should be installed in all Coast Guard aircraft, both rotary and fixed wing.

Letters of FAA Administrator David R. Hinson dated February 17, 1995 to the President of the Senate and the Speaker of the House, at 2.

Attachment A sets forth just a handful of the many other instances, reported through NASA's Aviation Safety Reporting System (ASRS) or reported to FAA as ATC operational errors, in which TCAS II helped prevent a disaster in the air. Also included are two incidents involving freighters not equipped with TCAS II where severe evasive action had to be taken at the last minute to avoid a crash. In these cases, TCAS II could have provided aircrews with more advance warning to avert a collision.

In 1995, the FAA took the unprecedented step of authorizing pilots to deviate from their ATC clearance in order to respond to a TCAS resolution advisory ("RA"). See

Notification to Air Traffic Control (ATC) of Deviations From ATC Clearances in Response to Traffic Alert and Collision Avoidance System Resolution Advisories, Final Rule ("ATC Clearance Rule"), 60 Fed. Reg. 50676. Previously, a deviation from an ATC clearance -- without first obtaining an amended ATC clearance -- was allowed only in an emergency situation, and, in fact, under the current rule, the only non-emergency situation in which pilots are allowed to deviate from ATC clearance without first obtaining an amended clearance is in response to a TCAS RA. *See* 14 CFR § 91.123.

The FAA states that "[w]hen an RA occurs, the pilot flying should respond by direct attention to RA displays and should maneuver as indicated unless doing so would jeopardize the safe operation of the flight or unless the flight crew has definitive visual acquisition of the aircraft causing the RA." *ATC Clearance Rule*, 60 Fed. Reg. 50676. Instructing pilots to respond directly to TCAS Resolution Advisories and allowing pilots to deviate from assigned ATC clearances in response to a TCAS RA demonstrate FAA's belief that TCAS provides a valuable "backup (safety net) to visual collision avoidance, application of right of way rules, and air traffic separation services. Since its inception, TCAS has been considered by the FAA and industry to be a supplement to the ATC system that provides flight guidance to ensure adequate separation from other aircraft." *Id.* at 50678.

In the preamble to the rule, the FAA also stated that at an international TCAS conference, "TCAS was lauded by many flight crews as a safety enhancing cockpit device." *Id.* at 50677. The agency provided another example of TCAS in action, noting that "TCAS was credited by the captain of a major air carrier for saving the lives of nearly 700 people in two B747 aircraft traveling over the Pacific Ocean." *Id.*

Even if the federal government is only concerned with saving the lives of passengers and people on the ground, instead of pilots, the agency should understand that mandating the equipage of transport category cargo planes with TCAS II will help prevent collisions between cargo planes and passenger planes and help prevent catastrophes whereby cargo aircraft and aircraft with which they collide fall onto populated areas, causing injury or death to those below. As the 1992 crash of an El Al cargo plane in Amsterdam illustrates, an accident involving cargo planes may cause significant damage and loss of life on the ground.

In addition, of course, the economic loss of one or two transport category airplanes in a midair collision reaches into the tens or hundreds of millions of dollars. The value of goods carried by cargo planes and lost in a crash will also add significantly to the economic loss that TCAS II can help avoid.

Part 121 Does Not Distinguish Between Cargo and Passenger Airplanes In Requiring Other Airborne Accident Avoidance Devices and There is No Justification for Continuing to Make Such a Distinction for TCAS

Basically, a pilot of an aircraft in flight is concerned with avoiding four things:

-- a collision with the ground;

-- thunderstorms;

-- microbursts; and

-- a collision with other aircraft.

14 CFR Part 121 (FAR Part 121) mandates that cargo airplanes, along with passenger airplanes, be equipped with modern technology to assist the pilot in avoiding the first three problems. *See* §121.357, mandating installation in all "transport category airplane[s]" of approved airborne weather radar equipment; §121.358, mandating all "turbine powered airplane[s]" to be equipped with an approved windshear

warning and flight guidance system, an approved airborne detection and avoidance system, an approved combination of these systems, or an airborne windshear warning system, depending on the type of aircraft and the date of manufacture; and §121.360, mandating ground proximity warning systems for all "turbine-powered airplane[s]." Only with respect to avoiding collisions with other aircraft does Part 121 draw a distinction between passenger airplanes and cargo airplanes. *See* §121.356(a), which requires that "each certificate holder operating a large airplane that has a passenger seating configuration, excluding any pilot seat, of more than 30 seats, shall equip its airplanes with an approved TCAS II traffic alert and collision avoidance system and the appropriate class of Mode S transponder" according to a specified schedule that required full compliance by the end of 1993. [The schedule originally set a deadline of the end of 1991, but was subsequently revised by FAA.]

IPA understands that §121.356 was promulgated in response to a congressional directive, contained in the Airport and Airway Safety and Capacity Act of 1987, which mandated that "The Administrator shall require by regulation that, not later than 30 months after the date of certification of the collision avoidance system known as TCAS II, such system be installed and operated on each civil aircraft which has a maximum passenger capacity of more than 30 seats and which is used to provide air transportation of passengers, including intrastate air passengers." Pub. L. No. 100-223, Section 203 (December 30, 1987), recodified at 49 U.S.C. 44716. However, the congressional directive was the <u>minimum</u> requirement that FAA had to impose, <u>not</u> a <u>limitation</u> on the requirement that FAA <u>could impose</u> on air carriers with respect to TCAS II.

In fact, in the same rulemaking in which the FAA added §121.356, the FAA went beyond the Congressional mandate and required that TCAS I be installed on all Part 135 aircraft with 10-30 seats. *See Traffic Alert and Collision Avoidance System*, 54 Fed. Reg. 940, 951 (1989), adding §135.180. Thus, by its own rulemaking, the FAA tacitly acknowledged that it was not strictly limited to requiring airborne collision avoidance systems only for those aircraft mandated by Congress (*i.e.*, those with over 30 passenger seats).

In a Report to Congress earlier this year, the FAA explicitly acknowledged that its rulemaking authority regarding TCAS was not limited by the Congressional mandate. "While not required by Public Law 100-223, the Federal Aviation Regulations require the installation and operation of TCAS I in turbine-powered airplanes with 10-30 passenger seats operated under an air carrier certificate." *Letters of FAA Administrator David R. Hinson, dated March 29, 1996, to the President of the Senate and the Speaker of the House.*

Europe and Japan are Moving to Implement TCAS on All Aircraft Weighing More Than Approximately 34,000 Pounds

The United States, under the leadership of the FAA, has traditionally been at the forefront of aviation safety improvements worldwide. In fact, the United States led the way in developing and implementing collision avoidance systems through the TCAS program. However, it now appears that other nations are moving ahead of the U.S. in mandating TCAS requirements for aircraft based on their size -- not just the number of seats they hold. In the same March 29, 1996 Report to Congress cited above, the FAA noted that

> The Eurocontrol airborne collision avoidance system Policy Task Force has recently completed the development of a unified policy for the implementation of TCAS in European airspace. The policy delivered to

> the Committee of Management specifies that TCAS be implemented in all European airspace effective January 1, 2000. It would require the implementation of TCAS by all aircraft with more than 30 passenger seats or weighing more than 15,500 kilograms [approximately 34,000 lbs.].
>
> In addition to the Eurocontrol decision to mandate TCAS within European airspace, the Japanese Government recently decided to mandate TCAS operation within its airspace effective January 1, 2001, for aircraft with more than 30-passenger seats or weighing more than 15,000 kilograms [approximately 33,000 lbs.].

Id. (emphasis added).

The approach taken by the Japanese and Europeans to ensure that all aircraft above a certain size are equipped with TCAS -- whether or not they have more than 30 seats -- makes sense, given the operational characteristics and operating environment of such aircraft, as discussed extensively below. The FAA should amend its regulations, as proposed in this petition, to incorporate an aircraft size-based component into the TCAS requirement, to ensure that aircraft operating in the U.S. airspace are at least as protected from mid-air collisions as aircraft operating in the airspace of other countries.

Significant Increases and Changes in Cargo Operations Since Enactment of §121.356 Warrant Mandating TCAS II for Transport Category All-Cargo Airplanes

The operating environment for cargo airplanes has changed dramatically since the 1987 TCAS II legislation and the original 1989 TCAS II rule. In the mid-1980's the overnight package business was a fledgling industry. Now, it is booming, growing at a rate of 10-15% per year domestically. In the past 15 years, the size of the cargo fleet has expanded dramatically; as of earlier this year, the two largest overnight package delivery companies, Federal Express (FedEx) and United Parcel Service (UPS), were operating 251 and 181 transport category airplanes, respectively. All told, it is estimated that the cargo carriers operate 700 to 800 transport category airplanes. In

addition, FedEx and UPS have 126 airplanes on order, with options on an additional 157 airplanes; addition of these airplanes would result in a 65% increase in their fleets. Thus. the air cargo industry is large and still growing rapidly. The number of airplanes the cargo industry operates, and will operate in the future, is substantial, especially considering the fact that the total number of airplanes operated by the carriers covered by the TCAS rule was 3,365 when the FAA promulgated the rule in 1989. *See* 54 Fed. Reg. 948.

Moreover, the nature of the overnight cargo industry has made its operational characteristics more closely resemble those of the passenger carriers. No longer do cargo carriers operate only a few flights, separated by wide distances in a point to point route system. Rather, they have hub and spoke systems in which large banks of flights arrive at and depart from their hubs in close proximity. For instance, in the Ohio Valley, 700 arriving aircraft are processed by the ATC system between the hours of 2300 and 0330, destined for cargo hubs at Indianapolis and Terre Haute, Indiana; Wilmington, Dayton, Cincinnati, and Columbus, Ohio; Louisville, Kentucky; and Memphis, Tennessee. Between 0330 and 0600, the same 700 aircraft depart, with various requests for direct routing (*i.e.*, outside of established airways) to their destinations. The ARTCC's responsible for this region (Indianapolis and Memphis Centers) control these arrivals and departures plus overflights from the east/west coasts and north/south borders, amidst some of the most inclement weather known to pilots. Thus, the workload demands on controllers are heavy, and there is a compelling need for on-board collision avoidance systems.

A sample one-day traffic count for four of the airports is set forth below, and it shows the magnitude of air freight operations during the nighttime.[1] Of particular significance is the fact that air traffic control workload during night time peaks nearly equals, or actually exceeds, the maximum workload during daylight hours. See for instance, Dayton at 0500 and 0600, Indianapolis at 0400, Memphis at 0200, and Louisville at 0400 and 2300.

Dayton, OH		Indianapolis, IN.		Memphis, TN.		Louisville, KY.	
Hour	Total Traffic	Hour	Total Traffic	Hour	Total Traffic	Hour	Total Traffic
0000	23	0000	33	0000	56	0000	35
0100	24	0100	31	0100	60	0100	15
0200	17	0200	17	**0200**	**88**	0200	20
0300	1	0300	14	0300	23	0300	22
0400	10	**0400**	**61**	0400	45	**0400**	**39**
0500	**35**	0500	10	0500	68	0500	28
0600	**37**	0600	13	0600	84	0600	19
0700	21	0700	13	0700	17	0700	17
0800	19	0800	36	0800	17	0800	22
0900	15	0900	36	0900	77	0900	27
1000	23	1000	45	1000	57	1000	27
1100	22	1100	32	1100	23	1100	26
1200	16	1200	38	1200	48	1200	25
1300	34	1300	31	1300	87	1300	20
1400	19	1400	42	1400	62	1400	19
1500	25	1500	38	1500	73	1500	34
1600	32	1600	36	1600	26	1600	40
1700	34	1700	59	1700	23	1700	32
1800	25	1800	37	1800	64	1800	20
1900	16	1900	50	1900	61	1900	22
2000	20	2000	37	2000	96	2000	25
2100	14	2100	29	2100	40	2100	10
2200	14	2200	33	2200	45	2200	12
2300	13	2300	23	2300	52	**2300**	**41**

[1] Table depicts traffic on a random day, Wednesday, November 15, 1995, except for Louisville, for which an hourly 24-hour count was unavailable for that day. Louisville traffic is for a random day of Wednesday, August 14, 1996.

Due to System Maintenance Typically Performed at Night, Fatigued Controllers On the Midnight Shift Often Operate an ATC System Without Automated Conflict Alert Capability

Compounding the dangers to air carriers operating at night in an often-congested environment is the fact that the FAA computer system needs preventive maintenance, system validation checks, enhancement installation, and testing, all of which are typically performed during the midnight ATC shift. When these computer maintenance tasks are being conducted at night, Terminal Area Radar Approach Control (TRACON) controllers lose the benefit of many of the features of the ARTS IIIA system, particularly the conflict alert software. When an Air Route Traffic Control Center (ARTCC) is operating in the Direct Access Radar Channel (DARC) backup system mode, conflict alert, Mode C Intruder and automated interfacility handoffs are not available. Thus, the workload imposed on the TRACON and ARTCC controllers to perform what would ordinarily be routine tasks is significantly increased during the frequent computer down time during the midnight shifts, when ATC enhancements to help prevent loss of aircraft separation are not available. An *NTSB Special Investigative Report on Air Traffic Control Outages*, adopted January 23, 1996, Notation 6644 (the "NTSB Report"), notes that most controllers were initially trained on--and have become dependent on--features such as automated handoffs and conflict alert. NTSB states that these features "are in fact safety enhancements." *NTSB Report* at 18. "Training" on the use of the DARC backup system occurs on the midnight shift--with real traffic--not simulated traffic. *Id.* NTSB found that on the job training familiarization is "a useful, but currently insufficient, way to train controllers on DARC operations." *Id.* at 19.

Added to this concern is the fact that controllers working the midnight shift are operating under sleep-deprived conditions. A recent study by the FAA's Civil Aeromedical Institute (CAMI) found that the amount of sleep obtained by controllers working on a 2-2-1 (afternoon-early morning-night) schedule "showed a characteristic decline from approximately 8 hours before the two afternoon shifts to 5 hours before the two early-morning shifts to 2.4 hours before the night shift."[2] This was even lower than the 3.5 to 3.75 hours of sleep before the midnight shift that had been reported in previous studies. *CAMI Study* at 13.

Sleep deprivation has been shown to decrease alertness and the ability to perform simple or complex tasks. The CAMI Study noted that previous research had found that "performance was mainly affected on the night shift." *Id.* at 2. Working the backside of the clock, during the body's natural circadian low point, has been the subject of a NASA study which states that

> Over the past 45 years, there has been a significant increase in scientific knowledge regarding sleep loss, circadian disruption, and their effects on performance and alertness. Laboratory studies have demonstrated that reducing sleep by 2 hr on one night is sufficient to significantly decrease subsequent alertness and performance. . . . In laboratory studies, the combination of working through the circadian temperature minimum with a sleep debt produces the poorest performance.

NASA Technical Memorandum 110380, Crew Factors in Flight Operations VII Psychophysiological Responses to Overnight Cargo Operations, February 1996 at 4.

The NASA study went on to warn that

> night work can require people to work through the circadian lowpoint in alertness and performance and displace sleep to a part of the circadian cycle where its quality and quantity are reduced. Currently, there are no countermeasures, which have been shown to

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[2] *Sleep Patterns in Air Traffic Controllers Working Rapidly Rotating Shifts; A Field Study*, FAA Civil Aeromedical Institute, DOT/FAA/AM-95/12 (April 1995) ("CAMI Study") at 13.

> be safe and effective in operational settings, to overcome the incomplete adaptation of the circadian clock to night work.

Id. at 5.

Of course, at the same time that sleep-deprived controllers are working without the benefit of conflict alert, which is available to their better-rested colleagues during the day, pilots are flying transport category airplanes while suffering from similar sleep loss and circadian lows. If ever there was an environment in which an automatic airborne conflict alert system could significantly enhance air safety, it is at night, when there are periods of heavy traffic, but controllers and pilots are likely to be sleep-deprived and fatigued, and when the ATC system's automated conflict alert feature may be unavailable due to system maintenance.

FAA Computer and Communications Outages Heighten the Need for Airborne Collision Avoidance Systems

ATC computer outages have been widely publicized, and NTSB found that, aside from controllers who regularly work the midnight shift, "the procedures for transition from normal operations to DARC/standalone, and vice versa, are not well-established or well understood." *NTSB Report* at 18. NTSB views such outages as "a serious condition that controllers must be prepared to handle" but often aren't. *Id.* Loss of the ATC-based safety enhancements such as conflict alert underscore the need for airborne collision avoidance systems.

NTSB found that controllers were even more concerned with communications problems--particularly air-to-ground frequency degradations or failures. "[C]ontrollers and air traffic managers said that they were more concerned about radio frequency outages . . . because controllers can only issue instructions to pilots with whom they are in radio contact." *Id.* at 20. Aircraft that lose radio contact with air traffic

controllers--and, thus, are no longer "controlled" by them--need airborne collision avoidance systems to be able to maintain adequate separation from other aircraft and operate safely. See Attachment A, Incident # 5.

The Move Toward "Free Flight" Provides an Additional Basis for Requiring Full TCAS II Equipage for All-Cargo Airplanes.

In the recent NPRM issued by the FAA proposing to eliminate the requirement for Mode S transponders for non-TCAS II equipped aircraft, the FAA points out one more development which argues for broader TCAS II coverage, the current effort to develop advanced methods of separation to allow "free flight," an "operational vision that will allow aircraft to cooperatively plan and execute their optimal flight paths with minimal interference from ground-based controllers." *Air Traffic Control Radar Beacon System and Mode S Transponder Requirements in the National Airspace System*, 61 Fed. Reg. 26036, 26037-38 (1996). The need for airborne collision avoidance systems in all transport category airplanes is heightened in an environment in which there is "minimal interference from ground based controllers."

Particularly relevant is the practice of some air cargo companies of maximizing fuel efficiency by seeking clearance to fly "against the grain," *e.g.*, flying eastbound at 35,000 feet, an altitude ordinarily reserved for westbound flights, in order to take advantage of prevailing winds and more efficient fuel burn. While pilots understand the desire of companies to save time and money, flying opposite prevailing traffic routes is somewhat akin to a visitor from England barrelling down the left side of a country road in the middle of the night. He makes great time until he plows into an American driver heading straight for him in the same lane. The original impetus for TCAS is that pilots operating airplanes traveling at hundreds of miles an hour do not always have adequate time to react to avoid a collision when they are in a see-and-avoid mode. This is

particularly true when flying at night against the prevailing traffic, when the closure rate is 1000 m.p.h. Modern TCAS II equipment aboard all jet liners can give aircraft operators the freedom to fly more fuel efficient routes without compromising safety. *See* Attachment A, Incident #1.

Cargo Flights Increasingly Operate in the Same Time and Place as Passenger Flights.

Even if the FAA were to take the dubious position that it does not matter whether cargo planes are properly equipped to avoid collisions with each other, changes in the nature of cargo operations have also increased the frequency of such operations in the same place and at the same time as passenger carrier operations. The public demand for overnight/same-day/2-day service is requiring air freight operators to conduct more business during daylight hours, when the ATC system is operating at or near 100% capacity with passenger carrier, corporate, and general aviation operations. Major cargo operators now fly a significant portion of their flights during daylight hours, compared to 10-15 years ago, when they flew almost exclusively at night. There has been an increase in daytime flying for cargo operators, for example, in departing west coast airports during the evening rush hours of passenger flights. To illustrate the point, the schedule for just one overnight cargo carrier shows that, in order to reach its Midwest sorting hub between 0200 and 0300, its departures from the major west coast airports must take place between 6:45 and 7:50 PM--well within the congested hours for those facilities.

TCAS II works best, of course, when the airplanes that are on a collision course are both equipped with the system, so that the two TCAS II units can communicate and coordinate evasive maneuvers. If a passenger airplane equipped with TCAS II and a cargo airplane without TCAS II are headed towards each other, obviously

there can be no such coordination. In essence, the airplanes are unintentionally engaged in a high speed game of "chicken," in which neither airplane or crew knows which way the other will go to avoid a collision. They may both climb, or both descend, which will not reduce--and could actually increase--the likelihood of a collision. Therefore, it is essential to the safety of the passenger airplane, as well as the cargo airplane, that the cargo airplane be equipped with TCAS II, allowing the two airplanes to coordinate the evasive action to avoid a collision.

A specific practice which demonstrates the need for equipping cargo airplanes with TCAS, given that passenger and cargo planes operate in the same environment, is the increasingly common request by passenger flights, particularly at night, for "block altitude" clearance, i.e., a clearance for a range of altitudes, such as 33,000-37,000 ft., which gives the pilot the right at any time to change altitudes within that range. Pilots of passenger aircraft request block altitudes in order to be able to adjust their altitudes to avoid turbulence which might disturb sleeping passengers. A consequence of this practice, however, is that the air traffic controller and other pilots--and even the pilot of the passenger aircraft--do not know at any given point in the flight the altitude at which the aircraft will be flying. Equipping surrounding aircraft with TCAS II will obviously enhance the safety of such operations, where aircraft are allowed to change their altitude without specific clearance for a precise altitude from ATC.

Innovative Use of TCAS

The following, real life scenario indicates the planned positive results that are being accomplished using TCAS II. An American MD-11 with TCAS II flies eastbound from Honolulu to Dallas. A United B-747, also with TCAS II, is following 20 nautical

miles behind, en route to Los Angeles. The United plane wants to operate at a greater speed than the American plane and pass through the same altitude. Today both aircraft can be serviced safely in the system by utilizing TCAS equipment to ensure adequate separation. The United B-747 can use the TCAS Aided Oceanic In-Trail Climb Procedure to climb above the American MD-11 and operate at a greater speed. This is a very safe procedure developed in cooperation with the FAA for areas where radar coverage is not available. To date, only United, American, Delta, Northwest, and Singapore Airlines flights operating in Visual Meteorological Conditions within the Oakland or Anchorage Flight Information Regions (FIRs) are approved for this procedure. With the addition of TCAS II to the cargo fleet, cargo carriers could also be approved to use the procedure.

Additionally, the FAA, in cooperation with ICAO, is establishing a Reduced Vertical Separation Minimum (RVSM) to be used in oceanic airspace.[3] This will reduce the present 2000 ft. vertical separation to 1000 ft. for aircraft operating between FL290 and FL410, inclusive, with Phase 1 of this program limited to altitudes from FL330 through FL370. Ensuring that all aircraft operating in the reduced separation environment are equipped with TCAS II will help ensure the safety of such operations.

Utilization of Flight Management Systems (FMS)[4] for aircraft to offset 10 to 20 nautical miles from the flight plan route is being developed for use in the continental U.S. This procedure would eliminate many air traffic control system bottle-necks on

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[3]Federal Aviation Administration (FAA) (September 1994) *OCEANIC OPERATIONS, An Authoritative Guide to Oceanic Operations* (Advisory Circular # 91-70).

[4]FMS is an aircraft computer system with a large database that can be programmed for a proposed route of flight, constantly updated, and can be altered en route for changing conditions.

preferred routings by allowing the aircraft to use parallel courses. Again, widespread use of TCAS II will allow such operations to be conducted safely.

CONCLUSION

TCAS II has proven to be a great success in averting midair collisions and near mid-air collisions. It is time to close a loophole by which transport category, all-cargo airplanes are not required to be equipped with TCAS II. These airplanes -- which include B-727's, B-747's, B-757's, B-767's, DC-8's, DC-10's and MD-11's -- are just as large and travel just as fast and have the same maneuvering characteristics as their passenger counterparts. The airspace environment in which they operate makes them at least as susceptible to the risk of mid-air collisions as passenger airplanes. In some cases, it is the same operating environment. The FAA's goal of one level of safety cannot be met with a significant portion of the transport category fleet unequipped with a proven airborne collision avoidance system.

SUMMARY OF PETITION OF THE INDEPENDENT PILOTS ASSOCIATION (IPA) FOR RULEMAKING TO AMEND 14 CFR §121.356 TO REQUIRE TCAS II ON TRANSPORT CATEGORY AIRPLANES FLOWN IN ALL-CARGO OPERATIONS

The Independent Pilots Association (IPA), which represents over 2000 pilots who fly for United Parcel Service, petitions for rulemaking to close a loophole whereby large airplanes flown in air cargo operations under 14 CFR Part 121 need not be equipped with TCAS II. The petition asks the FAA to amend 14 CFR §121.356 to require TCAS II on all transport category airplanes flown in all-cargo Part 121 operations, not just those airplanes with more than 30 passenger seats, as §121.356 currently provides. The deadline for equipping the cargo fleet with TCAS II would be December 31, 1998.

Factors militating towards the need for expanding the scope of the TCAS II requirement include: the exponential growth in all-cargo operations since the imposition of the requirement, particularly in the overnight package delivery services--which operate in a hub and spoke system that brings hundreds of airplanes into ATC sectors within a few hours, similar to passenger hub operations; use of the same airspace at the same time by cargo and passenger carriers, brought about by an increase in daytime flying for cargo operators, e.g., in departing west coast airports during the evening rush hours of passenger flights, and increased daytime flying due to the advent of same day and second day air service; the desire of air cargo companies to maximize fuel efficiency by seeking clearance to fly "against the grain," *e.g.*, flying east bound at 35,000 feet, an altitude ordinarily reserved for westbound flights, in order to take advantage of prevailing winds and more efficient fuel burn; and the current effort to develop advanced methods of separation to allow "free flight," to allow aircraft to cooperatively plan and execute their optimal flight paths with minimal interference from ground-based controllers.

IPA believes that mandatory equipage of transport category all-cargo planes with TCAS II will significantly enhance aviation safety by reducing the risk of cargo planes colliding with each other and with passenger aircraft operating in the same airspace. This will reduce the risk of death and serious injury to pilots, passengers of other aircraft, and persons on the ground, and reduce the risk of economic loss caused by destruction of aircraft, the goods they carry, and property on which the wreckage may fall.