

June 2006

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Jetrader

International Society of Transport Aircraft Trading



Boeing's strategy for value

Farnborough



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ISTAT President **Thomas Heimsoth**

Jetrader is a bi-monthly publication of ISTAT, the International Society of Transport Aircraft Trading. ISTAT was founded in 1983 to act as a forum and to promote improved communications among those involved in aviation and supporting industries, who operate, manufacture, maintain, sell, purchase, finance, lease, appraise, insure or otherwise engage in activities related to transport category aircraft.

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Dear Members,

The Farnborough Air Show is upon us once again and we have been busy making preparations for our Reception, which has become, most certainly, one of the premiere events during the Air Show. All is set for our Reception, which is at The Science Museum, London, England on July 17, 2006 from 6:30 to 8:30 PM. We have expanded the venue to include both Making the Modern World & Energy Wings within the Science Museum so we are ready to receive our members and their guests. Just a brief reminder, the Reception is by invitation only, so please R.S.V.P. well before the Reception to assist us in our planning. Thanks to our sponsors Evergreen, GA Telesis, Guggenheim and Pratt & Whitney for their much needed financial backing to support this event.

Registration is now open for our upcoming 13th Annual European Conference on October 5-7, 2006. The ISTAT Board has selected a magnificent setting for this event at the beautiful Le Meridien Beach Plaza, Monaco. Peter Huijbers, our repeat European Conference Chairman, is deep in the preparations and is fine tuning the Conference Agenda in preparation for your arrival. Among the topics to be discussed at the Conference will include some of the challenges facing our industry due to the continuing high oil prices, transition of aircraft between Aviation Authorities, the Lessors' views of aircraft values, the new and used freighter market and commentary from a number of senior airline executives. Glance to your right and you will see Peter's travelogue, it will make you WANT to be there. Look inside and you will find the 13th European Conference brochure more fully describing this exciting Conference.

It's not too early to start planning for the 24th ISTAT Annual Conference, which will be held at the Marriott Desert Ridge Resort & Spa in Phoenix, Arizona March 11-13, 2007. We had almost 900 participants at the 23rd Annual Conference and expect to exceed that again. Please put the dates in your calendar as we prepare the program for our biggest 2007 event.

As many of you are aware, the ISTAT Foundation has made great strides over the past several years in the areas of our student scholarships and grant programs. We have also recently implemented a student internship program which brings our relationships with the universities to our member companies to provide a mutually beneficial program for all participants. Lastly, we have initiated a humanitarian relief element of our Foundation programs which has unlimited possibilities in the future. There is a shining example of this type of effort being performed by many of our existing ISTAT members primarily outside of our ISTAT Foundation but, through an organization that many of you are very familiar, ORBIS Flying Eye Hospital. I commend our members for their personal and financial contributions to this organization and ask each of you to take a moment and give thought to the amazing contributions the ISTAT Foundation can make to our world with the power of an idea and the energy of the members of ISTAT to give back to the many that have so little. I believe the ISTAT Foundation has only begun its journey as an important tool for the ISTAT membership to extend its positive contributions.

I look forward to seeing you at Farnborough and in Monaco.

Best,
Thomas Heimsoth
President.



cover photo Kiran Ridley
Flying Eye Hospital in Bangladesh
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13th European ISTAT Conference

5 - 7 October 2006
Le Meridien . Monaco



ISTAT is very pleased to have **Monaco** as its venue for the next European Conference.

Why Monaco? We believe Monaco has an appeal to the ISTAT members by offering an exciting program, great sponsors as well as a superb conference hotel. Nice Airport, as the next nearest airport to Monaco (if one ignores the helicopter airport) is easily reachable by either long haul carriers, European major carriers or low cost carriers.

The conference actually takes place in Monte Carlo; Le Meridien Beach Plaza has a wonderful conference area, elegant rooms and a nice outdoors infrastructure with the only private hotel beach in the country! The restaurant is open 24 hrs and as a result the bar as well.... The Monaco golf course is one of the most beautiful ones, overlooking the bay, just 20 minutes away.

We are also very pleased with our sponsors: Airbus, Avion Group, Boeing, GOAL -- German Operating Aircraft Leasing and WestLB.

Last but not least, you can enjoy spectacular weather during the conference with the potential for lunch and receptions outside—an average temperature of 70 F in October.

About Monaco: A sovereign and independent state, the Principality of Monaco has borders on its landward side with several communes of the French Department of the Alps-Maritimes; from west to east these are Cap d'Ail, la Turbie, Beausoleil and Roquebrune Cap Martin. Seawards, Monaco faces the Mediterranean. The population of the Principality consists of slightly fewer than 30,000 inhabitants. Its surface area is 195 hectares, of which nearly 40 were recovered from the sea during the course of the last twenty years. Its width varies between 1050 meters and a mere 350 meters. Its coastline is 4100 meters long. The principality took its name from Monoikos, the Greek surname for this mythological strong man.

After being independent for 800 years, Monaco was annexed to France in 1793 and was placed under Sardinia's protection in 1815. By the Franco-Monégasque treaty of 1861, Monaco went under French guardianship but continued to be independent. A treaty made with France in 1918 contained a clause providing that, in the event that the male Grimaldi dynasty should die out, Monaco would become an autonomous state under French protection.

Monaco has a tourist business that attracts as many as 1.5 million visitors a year and is famous for its beaches and casinos, especially world-famous Monte Carlo. It had gaming tables as early as 1856. The country was admitted to the UN in May 1993, making it the smallest country represented there. It celebrated the 700th anniversary of the Grimaldi reign in 1997. In 2002, the constitution was revised to ensure that the Grimaldi's retain the throne even if Crown Prince Albert has no heir.

Looking forward to meet you in Monaco, do not wait to sign up! Watch for more information on the speakers and program in the next Jetrader. Peter Huijbers, Lufthansa Technik, Conference Chairman

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Farnborough Air Show ISTAT Reception

Science Museum, London 6:30 to 8:30 (by invitation)
17 July 2006

calendar ISTAT

24th Annual Conference

March 2007

Marriott Desert Ridge Resort & Spa . Phoenix

Strategy for Value

Boeing delivers technology to Customers

Boeing Staff Report

Value in the commercial airline industry is represented and measured in several key ways. For instance, the airline must deliver value to the passengers and cargo forwarders. Additionally, the airlines must be able to see value in terms of efficient and reliable aircraft operation and reasonable ownership costs.

Accordingly, Boeing is focused on staying abreast of the most recent advances in technology both within the aerospace industry and elsewhere so that Boeing can create the airplanes and services that deliver the most value to the airlines of the world. This has been a standard procedure at Boeing for the entire history of commercial jet aviation.

A disciplined and steady approach is needed to ensure the company continues to invest in the skills and investigations required to understand the advances being made. Small, specialized teams keep track of developments and elevate them for review when progress appears promising. These teams often work closely with universities and international think tanks to keep abreast of new technologies and advances being made with existing technologies.

In this way, developments can be continuously considered for potential application on Boeing jetliners. But finding a candidate technology is just the beginning of the process.

Before Boeing puts any new technology on board its airplanes or into the service arena,

This is the process that Boeing has used to introduce the new technologies that have changed the course of our industry for decades – the longer-range capability of the 747, the fly-by-wire reliability of the 777 and now the super efficiency of the 787 Dreamliner.

Beginning in the year 2000, Boeing could see on the horizon a series of technology advancements that could be used to substantially increase the value of a commercial airplane.

Two very dramatic advancements were just becoming possible for commercial airplanes.

The first of these - composite materials - had proven their performance on the 777. They were lighter weight and more durable than aluminum and a clearly superior material for airframe structure. Boeing could see that along with its partners it could invent new manufacturing techniques and tools that would enable them to efficiently produce large structure from this material and introduce new efficiencies to the factory floors.

The second was in the systems area was to move to electrical power as the prime source of power for the airplane. This step involved replacing the traditional bleed air systems for cabin pressurization, wing anti-icing and high demand hydraulic power with electrically powered systems. This resulted in less power extraction from the engines and a simpler, more reliable set of equipment.

A new systems architecture was also incorporated as a result of a process that had been under way between Boeing and its systems suppliers for year. Instead of the traditional approach – which resulted in a closed system that was hard to update, the new approach is based

on industry standards and “open.” This means that new software can be written by and loaded more easily to provide for upgrades throughout the life of the airplane. Safeguards have been developed to ensure the lifelong integrity of the system.

Of course, the components that would be needed for new engines that would reduce fuel consumption and lower emissions were being developed by the engine manufacturers. New computer codes had been developed by Boeing that would allow engineers to further refine the exterior shaping of an airplane to ensure it was aerodynamically efficient.

And other digital tools, tools that would allow international, real-time access to an product definition database, would be available to allow the placement of work where it would be done most efficiently.

And they were all expected to be mature – proven ready for application on a commercial jetliner – in time for an airplane that would deliver in 2008.

By working with the world’s airlines, Boeing developed a strategy to deploy these technologies on a mid-sized airplane that would deliver efficient performance on long-range flights.

After developing the configuration and determining how to best apply the new technologies, Boeing began to offer the all-new 787 Dreamliner for sale in later 2003. Within four months, the airplane was launched with a record-setting order for 50 airplanes from ANA (All Nippon Airways). Today, the 787 is most successful launch of a new airplane ever with orders and commitments for nearly 400 airplanes from 29 customers.

This phenomenal market response to the 787 demonstrates that the rigorous process used by Boeing to identify, develop and apply new technologies to provide value for airlines and passengers continues to be the right approach.

Testing continues to validate the fitness of these technologies. Flight test – the ultimate proof of performance – is scheduled to begin in summer 2007.

there is a series of requirements that must be met to ensure that the technology offers a real increase in value delivered to the airline industry.

The technology – be it a new material, a new system or new processes, no matter how large or small – must be demonstrated to be safe to the rigorous requirements of the regulatory agencies and Boeing itself.

Boeing ensures that all technologies undergo significant testing to determine that they are reliable and can withstand severe flight conditions, hard and steady use by the airlines and the rigors of the modern air transportation control systems. Extensive testing and demonstration, starting with small sub-elements and leading to full-scale testing, must be done in the laboratory and sometimes on test flights. Boeing has its own laboratories for much of the testing. Other tests are conducted by its industrial partners or by universities, depending on the requirements and capabilities of the facilities available.

Meeting regulations isn’t enough to consider a technology ready to be included on or used by a Boeing jetliner however. In addition, the candidate technology must demonstrate that it provides value by being better than existing technologies in terms of quality, cost or performance. In order to be incorporated, the new technology must offer a measurable improvement in at least one of these three, without penalizing the others. The business realities of the airlines make it incumbent upon manufacturers to introduce changes only if they will lead to increased safety, improved reliability, enhanced environmental performance, lower costs or a better flying experience for passengers.

Once a new technology is on one Boeing airplane it is often considered both for other new airliners and for retrofit onto other Boeing airplanes – one way that commonality can be continued throughout the Boeing fleet even as new technologies are introduced.



Insurance is not a dirty word — “Insurance Underwriters are good people”

by Donald G. Kenny, Senior Vice President, Falcon Insurance Services

I hope these statements do not surprise too many aircraft insurance buyers, but both statements are absolutely true. In fact, some of my best friends are insurance underwriters. I think it's about time that we looked at the facts and spread some truth about the little known world of airline insurance underwriting.

To help put things into proper perspective, let's first glance at the world of automobile insurance. A few basic facts, there are about 235,000,000 private, public and commercial vehicles registered in the US and the average value of each is say, \$20,000. If we were insurance actuaries, we'd be able to apply the law of large numbers — the more units within a given population, the higher our likelihood of forecasting a specific occurrence. We could probably calculate with reasonable accuracy, (a) how many automobiles might crash in a given day, week or year, (b) what the average claim might cost, for Physical Damage as well as Bodily Injury and Property Damage liability.

After adding in some overhead expenses factors and a reasonable profit margin, we'd be able to set an actuarially sound premium level to charge our automobile insurance customers. Now let's put ourselves in the position of the airline insurance underwriter: There are only about 17,000 airliners flying around the world and any one could be worth as much as say, \$250,000,000. Many carry liability limits as high as \$ 1 or \$2 billion

Now here's the tricky part.

Today, the entire global pool of written premium for airlines is about \$2 billion. -How many of the 17,000 aircraft will suffer losses this year? What will be the insured hull value of a single loss, all losses? What will be the legal liability judgment of a single loss, all losses? What impact could the loss of just one aircraft have on the entire book of business?

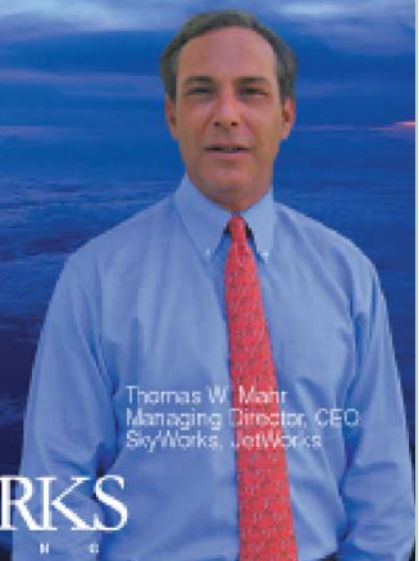
THE LOSS OF JUST ONE AIRCRAFT COULD POTENTIALLY WIPE OUT THE ENTIRE BOOK OF AIRLINE INSURANCE PREMIUM!!

Underwriters should be viewed as an integral part of the airline's risk management team. The fortunes and misfortunes of the airlines and their underwriters very much go hand-in-hand.

Insurance continued page 6

Innovative and accomplished teams of financial and technical professionals leading the aviation industry.

Our First Task Each Day: *Question All Assumptions*



Thomas W. Mahr
Managing Director, CEO
SkyWorks, JetWorks

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There is no actuarially sound way to price the airline insurance product. Sad to say, it's more often than not, a roll of the dice. Underwriters do their best to carefully select the safest aircraft operators and assign a premium level that reflects the actual exposure; they consider the types of aircraft flown, determine the Average Fleet Value, look at the Revenue Passenger Miles flown, look at the profile of a typical passenger, look at the routes actually flown, consider weather conditions in the areas the airline fly's, consider geopolitical risks, focus on how managements handling of safety issues, what pilot hiring/training minimums, etc, etc.

But when they are all done, it's still very much a roll of the dice.

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But when they are all done, it's still very much a roll of the dice. There are too few exposure units for the law of large numbers to apply. If underwriters set prices too low, losses quickly exceed written premiums and premium levels are forced upward. If underwriters set prices too high, profits mount and premium levels begin to drop as more underwriting "supply" enters this insurance sector.

So, accordingly, we are always looking at a traditional supply & demand business cycle. As underwriting losses mount, capacity (read \$\$\$) exits the business sector and premium levels rise. As underwriting profits mount, capacity enters the business sector and prices decrease.

The airline insurance broker will tell you that one of his/her roles is to monitor market conditions to assure that his/her client gets fair treatment from this dynamic market. Treatment that truly reflects the underwriting merits of the specific client. If market pressures are driving rates upwards by an average of 25% at this time in the rating cycle and I am renewing an exemplary account, I will try to make the case that this account does not warrant a full 25% market-driven rate increase. If market pressures are driving rates downward by an average of 25% at this time in the rating cycle, I need to justify why this client is deserving of more than a 25% rate reduction. Regardless of the underwriting merits of any given airline, one cannot ignore the overall impact of the dynamic supply & demand market pressures. The truth is that all clients are part of the total pool of exposures and losses and we are all in this together.

I recall placing insurance for an airline client that had not suffered a major/total loss in 23 years. Boasting about this immaculate track record with a European underwriter one year, he responded "... that may be a meaningful consideration if you reach 25 years. ..." Turns out we suffered a total loss two years later. Did that loss make this client a "bad" risk? Did the 24 years of good loss experience, make it a "good" risk? Of course, the answer to both questions is an emphatic "No".

The underwriting judgment on the desirability of a given airline is a much more complex question. There's a lot more art and alchemy in the airline underwriting profession than the underwriters ever get credit for.

This brings me to another sore point. Why do airlines partner with their bankers, team with their legal counsel, but just buy insurance from their underwriter??? Senior airline executives spend hundreds of hours each year discussing business, financial and legal issues with their financial and legal partners. Yet, senior airline executives, at best, spend only a few days

each year dealing with an insurance renewal. More often than not, insurance buying is just a chore delegated to the airline's Insurance Department for handling. **Let me see if I have this right.** Airlines rely upon the promise of an underwriter(s) to pay for a hull loss that might be as high as \$250,000,000 and to further rely upon that what's-his-name underwriter to protect the airline from a potential lawsuit totaling as much as \$2+ billion, and we only know what we see/hear from that underwriter in the once-a-year renewal meeting? **Is this any way to run an airline?** Underwriters should be viewed as an integral part of the airline's risk management team. The fortunes and misfortunes of the airlines and their underwriters very much go hand-in-hand. In 30 years of airline underwriting and broking, I've learned that it is good business practice to build a strong working relationship between a client and the underwriter. Underwriter and clients need to work together to build a comprehensive and competitive insurance program to meet the airline's needs.

It is a good practice to meet with your underwriter after the renewal negotiation. Too often, discussions can become heated during intense renewal negotiations. It's a good practice to calmly get together with your underwriter(s) about mid way through the policy year -- to review your current business plan, discuss any possible changes in aircraft fleet values or mix, new routes planned, etc. Learn from the underwriter the state of the insurance market. Understand the pressures the underwriter faces in this dynamic marketplace.

I use the word "underwriter", when actually, there are multiple "underwriters" involved in an airline's Hull & Liability and Hull War Insurance Programs. These programs are written on a "quota share" basis, i.e. a certain underwriter is selected as a "leader" (who sets policy terms, conditions, settles losses, etc) and then "following" underwriters sign under where the leader has written his/her name (underwriter, get it?). An airline insurance buyer should get to know your lead underwriter and the major following underwriters.

Promises Let's also remember that all insurance policies are simply "promises". Underwriters promise to do something. Airlines are not purchasing a physical product that can be measured or tested or "tried on for size". They are only obtaining a "promise". That "promise" is only as good as the integrity of the party making the promise. In fact, if they are very fortunate, the airline client will never give the underwriter a chance to fulfill that promise.

A unique relationship indeed. And what happens when a loss does occur? Settling Airline Hull or Liability losses is not always a simple black & white issue. There are often many shades of grey to deal with.

I've seen hull losses settled as "total" losses that some observers might have concluded are simply "partial" losses. Determining what is a "total" or "partial" loss is not always a precise science. The professional underwriter will adhere to the policy wording of course, but he/she are also sensitive to the pressures and priorities at the time of loss. The goal is to make the insured "whole" as quickly as possible.

Leading underwriters and airline brokers take pride in how quickly that can settle a major hull loss -- making \$100+ million loss payments within 48 hours after an accident is not unusual. This is a reflection of



Mr. Kenny is a senior aviation insurance expert with over 30 years experience as an aviation insurance underwriter and broker. His account responsibilities have included major aviation leasing/financing firms, major domestic and international airlines as well as primary airframe and powerplant manufacturers.

a partnership between the airline and the underwriter. In fact, I've also seen a client refuse a total loss hull payment a few short days after a crash, because it deemed such action to be in bad taste. They preferred to first focus on dealing with the injured and deceased passenger issues before worrying about their economic loss. That's a special kind of client.

Dealing with major liability losses are an even more involved process. All Airline Risk Management Department's have a written comprehensive and thoroughly rehearsed emergency response plan in that is endorsed and supported by the very highest levels of airline management.

This plan should integrate the resources and experience of the underwriter's claims representatives. Dealing with the human tragedy as well as the business impact of a major crash requires the unique set of skills that only a professional aviation underwriting organization can bring into play.

Most airlines thankfully, do not have to deal with a tragedy sometimes for generations, but the underwriter deals with such events on a regular basis. Draw from this vast pool of experience to help manage the entire process. At the end of the day, this is what you are paying for.

So the next time you are wondering why your insurance costs are going up –or down, remember, you are a part of the very small world of airline insurance. Your fleet of aircraft join the balance of the 17,000 airliners serving the traveling public. Both you and your underwriter serve the interests of these travelers.

13th Annual European ISTAT Conference

5 -7 October 2006
Le Meridien . Monaco



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Farnborough is Airbus' chance for some salvation

By Scott Hamilton

It's been a tough year for Airbus.

After riding high since 2000, over-taking Boeing in orders and deliveries and having two real winners in the A330 and A320 family, the company was looking forward to the entry into service of the A380 super jumbo at the end of the year.

The A350 got off to a good start after launch, despite conventional wisdom to the contrary. Within six months of launch, Airbus had 100 firm orders from 16 customers. This compared with 52 orders from two customers for the vaunted Boeing 787 in the first six months of its launch. The A350 launch trailed the 787 by a year, yet racked up 182 firm orders and commitments compared to 400 for the 787, a respectable showing if a fair and unbiased assessment were undertaken.

But things quickly unraveled in March. The annual general meeting (USA) for the International Society of Transport Aircraft Trading (ISTAT) was held in Orlando, FL, this year. Almost 900 industry officials attended. Many high-powered executives were present, including Airbus customers.

The Chief Operating Officer-Commercial of Airbus, John Leahy, was a presenter on the Tuesday morning of the conference. That afternoon, Steven Udvar-Hazy, Chairman and CEO of giant International

Lease Finance Corp., with Stephen Hannahs, CEO, Aviation Capital Group, and Henry Hubschman, CEO, GECAS, would be on the Lessor Panel. Hazy is known to be close to Leahy and ILFC is Airbus' biggest customer. ILFC orders include 10 for the A380 and 16 for the A350.

The A350 had an image problem. It began as a re-engined iteration of the A330, the Airbus answer to the 787 Dreamliner, dismissed so cavalierly by Leahy and his boss, Noel Forgeard, one-time CEO of Airbus but now non-executive chairman of the manufacturer and co-CEO of its parent, EADS. Airlines quickly let Airbus know that merely face-lifting the A330 and calling it the A350 wasn't sufficient.

After four tries, Airbus thought it had a solid competitor to the 787. The A350 had new engines, a new, all-composite wing (albeit based on the A330 wing design); an aluminum lithium fuselage it believed was easier and less costly to repair from ramp damage than the 787's composite fuselage; an A380-compatible cockpit; an all-new interior; and a host of other technical improvements. The only thing it didn't have was a new fuselage design—it was the same cross-section as the A300, designed nearly 40 years earlier—and a redesigned wing with a greater sweep for higher speed.

Airbus will get through this in time. It took Boeing nine years. It may well take Airbus an equal amount of time.

Stephen **Hannahs**, CEO, Aviation Capital Group; Steven **Udvar-Hazy**, Chairman + CEO, ILFC; Henry **Hubschman**, CEO, GECAS comprise the Lessor Panel at ISTAT's 23rd Annual Meeting in Orlando, March 2006

Airbus officials thought neither was a critical short-coming. The interior at armrest height was only 4 ½ inches narrower than the 787, arguably an inconsequential amount. The wing design produced an airplane 27 minutes slower than the 787 over 8,000 miles. But the A350 carried as many as 30 more passengers for greater revenue potential, analysis suggested.

It was a beautiful day. Certainly nothing to portend the figurative dark thunderheads and torrential downpours that were about to burst over John Leahy's head and Airbus' corporate headquarters in Toulouse, France, a continent away.

Leahy's Tuesday morning presentation was, as is typical for him, an entertaining one. There were

the usual light jabs at Boeing with Leahy's trademark quips. He gave his usual spirited defense of the controversial A380 and, by general consensus (even of Boeing), a good, credible and well-grounded presentation and defense of the A350.

That afternoon, Hazy, Hannahs and Hubschman participated in the Lessors Panel. GECAS and ACG are both Airbus customers, although ACG has on order only the A320 family. GECAS purchased the A320 and ordered the A350.

Hazy had been to Boeing's Everett, WA, delivery center the preceding Thursday. ILFC customer AeroMexico was taking delivery of its first 777-300ER, leased from Hazy's firm. During the course of the day, Hazy gave an interview to the Everett Herald's aerospace writer, Bryan Corliss.

Corliss was on his way out of town and filed a short piece for his aerospace blog, reporting that Hazy thought Airbus needed to do some more work on the A350 to make it a better airplane. The blog was brief and general, but it set the stage for the downburst about to hit Leahy and Airbus.

After the prepared presentation for the lessors panel of ILFC, GECAS and ACG, moderator Jim Ott threw open the discussion for questions from the floor.

"Last Friday," a question began, "The Everett Herald reported that you thought Airbus had to do more work on the A350. The report was too general to tell us much. Could you tell us specifically what you

Airbus continued next page



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Airbus continued

had in mind and what you think Airbus needs to do?"

Hazy asked if Leahy was still in the audience. From the back of the large room, leaning against the wall, Leahy affirmed that he was. Then Hazy launched. He recited Boeing's shortcomings of the previous decade and how Airbus capitalized on that. Then he said the situation had turned. Boeing now had the initiative and Airbus responded to the 787 with what was a good airplane but which was, in his view, a Silver Medalist to Boeing's Gold Medalist. The A350, unless a new fuselage and wing were added, would get no more than 25% of the market, he believed. And, oh, by the way, the A380 wouldn't sell more than 300 or 400 airplanes over the next 20 years.

It was an unprecedented public scolding of Airbus by its largest and perhaps most influential customer. If the crowd was stunned, the reaction in the next day's papers had world-wide repercussions.

The aerospace reporter for *The Seattle Times*, Dominic Gates, had been in the audience when Hazy smacked Airbus around. In his follow-up interview, Gates also talked with Henry Hubschman, CEO of GECAS. The story he filed that night, for print the next day, headlined Hazy's remarks and reported that the GECAS chief endorsed them. Airbus said later it talked with the GECAS CEO, who Airbus claims denied endorsing Hazy's statement, but by then the story had taken on a life of its own. The world's wire services picked up the story and soon, the CEO of Singapore Airlines weighed in on the record in an interview calling for a new wing and fuselage. A whole new round of world-wide stories began.

There was widespread speculation that Leahy had been fighting a losing internal battle to further improve the A350 and had put his friend, Hazy, up to making the public rebuke. One person close to both says each denies it and instead, Hazy was motivated more by the desire for Airbus to have a truly competitive product to increase ILFC's bargaining position with Boeing over future 787 orders—a theory that prob-

ably is more plausible for the shrewd businessman than Hazy is.

The rest of the A350 story is well known. Airbus officials authorized a fifth redesign of the airplane. At this writing, no official approval had been given to offer the fifth iteration of the airplane, but this was widely expected shortly before the Farnborough Air Show. It's also believed that the Air Show will see new orders for the A350 that will provide some salvation for the battered Airbus.

The A380 situation is more problematic. The surprise announcement in June that the airplane will have a second round of delivery delays of another six or seven months thrust the company into a leadership and governance crisis that will take months to get over, despite whatever immediate action is taken to change management or ownership structures.

The delivery delays will also shave \$2.5 billion in profits off the EADS income statements over the next five years. About 80% of EADS' cash flow comes from Airbus, and the hit comes at a very inopportune time. BAE, which owns 20% of Airbus, exercised its put option to sell its shares to EADS shortly before the A380 delays were announced. BAE felt at the exercise that its shares were worth more than \$5 billion—which happened to be more free cash than EADS had on hand at December 31.

Redesign of the A350 is estimated to cost an additional \$5 billion or more. As of May, Airbus had an unused \$10 billion credit line that could be tapped, but it's widely expected that Airbus will seek launch aid from governments for its A350 program. This will aggravate the trade war between the US and the European Union and could have a spill-over effect to the EADS proposal to sell converted A330s to the US Air Force as Northrop Grumman KC-30 aerial tankers. Many members of the US Congress don't believe the Air Force should award a contract to what essentially is Airbus while it's embroiled in a trade dispute.

Airbus' current troubles have generated hand-rubbing glee on the part of critics. But Boeing is not among them. Boeing engineers and the company's chief salesman, Scott Carson, are fully aware that delays in the 787 program are very possible. The complex nature of the composite fuselage production and the unprecedented out-sourcing by Boeing create all kinds of possibilities that the 787 could hit any number of snafus that could set back the aggressive production schedule forecast to commence with the first delivery in May or June of 2008. The Airbus critics also seem quick to forget Boeing's own production mess in 1997. The 737 and 747 lines had to be shut down for a month to straighten out the problems.

Airbus will get through this in time. It took Boeing nine years. It may well take Airbus an equal amount of time.

Scott Hamilton is an aviation consultant. He may be reached via www.leeham.net.

There was widespread speculation that Leahy had been fighting a losing internal battle to further improve the A350 and had put his friend, Hazy, up to making the public rebuke.

Hazy was motivated more by the desire for Airbus to have a truly competitive product to increase ILFC's bargaining position with Boeing over future 787 orders





Why I don't want to head the Fed

By Morton J Marcus

* One of the great mistakes financial analysts make is giving too much weight to interest rates in the total picture of economic activity. More important to the economy and to the Fed is inflation. Interest rates are just one means of seeking to control inflation.

There are many tasks we don't want. Race car driver. Bungee jumper. Grass mower. Barbeque chef. Mosquito abatement officer. Guest at a neighbor's grandchild's fifth birthday party. We each have our own list of abhorrent activities.

I would not want to be Chairman of the Federal Reserve Board. Ben Bernanke has the job and let him enjoy it. He is following Alan Greenspan. Arguably that is more difficult than following either Pope John Paul II or Bobby Knight. Greenspan never had the rabid following that Knight had among Indiana basketball fans. Nor did he enjoy the adoration that was given to John Paul. But Greenspan's efforts had a direct effect on the lives of virtually every inhabitant of the earth for more than eighteen years.

What is the Fed (as it is called by those who think they understand monetary policy) supposed to do? U.S. law, enacted by Congress, says it is to "promote effectively the goals of maximum employment,

stable prices and moderate long-term interest rates."

You can depend on that good old Congress to write a law with goals that have virtually no meaning. What is "maximum employment" and why would we want it? Is it our goal to have every citizen working? Did the Congress really mean a minimal unemployment rate? That makes no sense either. Only if people could get new jobs instantly would we have a zero unemployment rate.

Stable prices? Does that mean a change in prices between minus one percent and plus one percent per year? Perhaps it means a steady rate of price change. Does that mean we'll be satisfied with an inflation rate of just two percent per year? Would we be content if prices went up every year by ten percent? Inflation would be high be steady.

Are we to focus on the general level of prices or certain prices of key goods and services? We have the consumer price index and other measures to give us the general level of prices. But we get upset most about specific prices rising (petroleum, electricity, beer, and other necessities).

Then we have the real kicker. The Fed is charged with maintaining "moderate long-term interest rates". How is the Fed to do that? They can go into the market for long-term bonds (government or private securities). They could be selling bonds to push interest rates higher or buying bonds to push interest rates down.

Head the Fed continued page 14

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Delivering the Gift of Sight



By Capt. Gary Dyson, Central Region Chief Pilot
FedEx Express

You might say that I have one of the most unique offices around – the cockpit of a jumbo jet.

As a pilot for FedEx Express, I fly jets carrying cargo destined for various parts of the world. But there is another plane I fly in which the cargo is much different.

This plane carries a classroom, an operating room, a laser treatment room and a recovery suite. The passengers onboard include eye care specialists, nurses, and anesthesiologists working to eliminate avoidable blindness.

The airplane is the ORBIS Flying Eye Hospital – a DC-10 aircraft reconfigured into an ophthalmic surgical and teaching facility. It is operated by ORBIS International, a nonprofit humanitarian organization dedicated to preventing blindness and restoring sight in the developing world, where 90 percent of the blind and visually-disabled live.

By training eye care personnel and building suitable eye care services and infrastructure, ORBIS is improving the quality and accessibility of eye care in parts of the world where the need is greatest. The Privilege to Fly in Service of a Humanitarian Mission

How did I get the remarkable opportunity to apply my aviation expertise to work that changes people's lives in very profound ways? FedEx.

FedEx is a global sponsor of ORBIS and its Flying Eye Hospital. As ORBIS's primary aviation sponsor, FedEx provides at no cost to ORBIS, the annual aircraft maintenance, flight training and ground support required to keep the plane flying. FedEx also finances portions of ORBIS medical programs and ships urgently needed medical supplies to ORBIS program sites worldwide, again at no charge to the organization.



photo Peter Bregg

In addition, FedEx pilots volunteer to fly the world's only Flying Eye Hospital all over the globe to help ORBIS combat blindness through education and hands-on training of eye care specialists. This is why: the number of people who are blind is far greater than most people may think. More than 37 million men, women and children worldwide are blind. An additional 124 million suffer from acute visual impairment and are at high risk of losing their sight permanently.

Perhaps more staggering is the fact that 75 percent of the world's blindness is preventable – if existing treatments and cures can be delivered to the hardest hit countries. That's where ORBIS, FedEx, and other corporate and individual donors come in.

We have supported ORBIS since its inception in 1982. And as ORBIS's first Global Sponsor, FedEx is committed to the Delivering Sight Worldwide initiative, a global program aimed at increasing public awareness about avoidable blindness.

Annually, FedEx gives about \$1 million in cash and in-kind support to ORBIS. By underwriting the bulk of ORBIS's aviation costs and providing service to the humanitarian aircraft through 2011, FedEx is helping to ensure that individual cash donations can be spent directly on sight saving programs, allowing the charity to plan future training programs with in-

creased confidence.

Working Together To Share Sight-Saving Skills Around the World

It has been my good fortune to serve as an ORBIS volunteer for the last five years. I have piloted the Flying Eye Hospital to China, Bulgaria, Paraguay, Libya and other countries. Many of the world's leading health care professionals volunteer their time to perform surgery and teach aboard the aircraft in medical programs lasting one to four weeks.

Before this important work begins, the airplane is prepped for surgery in a host country. It is incredible to watch the ORBIS team transform the plane in just a few hours. It requires a tremendous amount of work – disinfecting the entire interior, setting up all the medical equipment, and more before patient screenings and surgical activities begin.

The first day of an in-country medical program begins with eye clinics at local hospitals where potential patients with eye problems such as tumors, glaucoma, and cornea disease are screened. The ORBIS medical team then selects surgical candidates.

After the screening and selection process is complete, the ORBIS medical staff perform surgeries



But what we see is the Fed adjusting what is known as the Fed Funds Rate – the rate at which banks borrow over-night funds from each other. That is a very short-term rate. And even here, the Fed does not set the rate; it only sets a target for that rate which is actually determined in the market among banks.

Every time the Fed increases rates, as it has for seventeen consecutive meetings there is an effect on every industry, world-wide. Higher interest rates not only slow the purchases of homes and autos, but of road-building equipment and the leasing of airplanes. But the effects are often less dramatic than the alarmists on TV would have us think.

Let's imagine that you want to build a house or lease an airplane. If interest rates are rising, and look like they will rise again soon, you will want to lock in today's rates with a fixed rate loan or lease. If you are lending money with expectations of rising rates, you're looking for a variable rate contract. Borrowers will be willing to absorb a somewhat higher rate to lock in now and therefore economic activity may be accelerated by the anticipation of higher rates. Thus rising interest rates may not slow down economic activity but actually increase it.

Changes in interest rates influence changes in the value of currencies. If the U.S. interest rate rises, it increases the value of the dollar because those with other currencies will find it more profitable to put their liquid assets into dollars than euros or another currencies.

Rising U.S. interests make Boeing's planes more expensive compared to those of Airbus. Many other factors are more important in determining the sales of these planes, but interest rates are part of the picture. Just as the value of the dollar will have a bearing on how many Americans will travel abroad, it is not the sole determinant.

One of the great mistakes financial analysts make is giving too much weight to interest rates in the total picture of economic activity. More important to the economy and to the Fed is inflation. Interest rates are just one means of seeking to control inflation.

The Fed must take either extreme or sustained action to influence inflation. Alan Greenspan and Ben Bernanke seek sustained action rather than extreme measures.

Remember that goal of stable prices? Stable prices mean that the value of the dollar remains steady not just in international markets but domestically as well. Stable does not mean fixed but flexible with minor, transitory variations. Who wants this? Does it matter to you?

That, as economists love to say, depends. If you have lots of debt, you would be happy to see the value of the dollar decline. You buy a airplane and finance it for \$7,000,000. Three years later you would not expect to get \$7,000,000 for your airplane. But if the value of the dollar has gone down, the amount of money you can get for your aircraft goes up. You feel fine. You got to use that plane for three years and are paying the bank back with \$7,000,000 that now will NOT buy the same airplane. The bank is not happy.

That is what the Fed is all about. The Fed is there to keep banks, their depositors, lenders, people with dollar denominated assets (like life insurance and leases) happy. When the Fed was created in 1913 it was for the purpose of preventing banks from going under. Bank failures in the past had caused massive, sudden recessions. The Fed was to be there to help prop up banks with cash when they needed it. The Fed was there to keep the value of the dollar from declining rapidly and thereby protecting the assets of the banks and other people and businesses that held cash or made loans.

When we hear that the price of oil is going up, it is putting downward pressure on the value of the dollar. The rising oil prices we have been seeing are in step with the declining value of the dollar. To encourage people to hold dollars (rather than other currencies) Mr. Bernanke and the Fed raise the Fed Funds Rate hoping that other interest rates will rise and investors will be encouraged to hold dollars.

It's a tricky business. If interest rates go up, consumers and businesses are less inclined to buy and build. Employment may fall. It is a juggling act more complex than any seen at any circus. That's why I don't want the job, but it still sounds better than mowing the lawn.

Mr. Marcus, formerly with Indiana University, is a freelance economist, speaker and columnist.



photo Robert Bell



photo Kiran Ridley



photo Geoff Oliver Bugbee

ORBIS continued

onboard the plane and in local hospitals. At the same time, they teach local medical professionals new surgical techniques since many of them have not had the opportunity to continue medical education courses.

Post-operative visits are conducted once the surgeries are complete. For me, this is when the magic unfolds. There are no words to describe what it feels like to watch someone have a cataract operated on one day, their bandages removed the next day, and then see – some for the first time in their lives – others for the first time in years. These patients include infants and children who will now be able to go to school, parents who can again earn a living for their families, and grandparents who will no longer need to rely on their children and neighbors. It is heartwarming to witness these life-changing experiences, and to know you played a small part in it.

On an ORBIS mission to Fuzhou, China, I became particularly close to one patient who was blinded in both eyes by cataracts. The lenses in this man's eyes had deteriorated due to poor diet and exposure to the sun, which resulted in him being unable to work or take care of his family.

On the day of his surgery, an ORBIS volunteer doctor invited me to observe the procedure to replace the lens in the man's right eye. While excited to witness the surgery, I was even more grateful to share in his special day. I stayed with him before the operation up through recovery, and then watched him return two days later to have his bandages removed and sight restored.

In just a matter of days, this man's entire existence changed. And all because of a relatively simple procedure performed onboard the ORBIS Flying Eye Hospital. I was forever changed by being a part of this man's remarkable transformation.

From Africa to Asia to South America, the Flying Eye Hospital touches down in areas struggling against poverty and lacking the kind of health care that we in the U.S. often take for granted.

That's why I am proud to serve as an ORBIS volunteer – so that the eye care training and treatment that is desperately needed around the world can be delivered. To date, more than a million people have received direct medical treatment. And it is now estimated that as many as 22.5 million children and adults have benefited from ORBIS programs worldwide as a result of the skills gained by medical professionals through training, then shared among colleagues and passed on to patients.

Few organizations put the power of aviation into a more powerful use than ORBIS and its Flying Eye Hospital. I am proud to work for a company like FedEx that is committed to delivering sight worldwide.

I also salute the members of the International Society of Transport Aircraft Trading who have generously supported this humanitarian cause since 1996. Through the ISTAT Foundation, ORBIS has received more than \$25,000 to date. On behalf of ORBIS and the Flying Eye Hospital volunteer flight crew, I'd like to thank the ISTAT Foundation for enabling us to reach more people with cures and timely treatments.

The Flying Eye Hospital and its crew are about to set off to Africa with training programs scheduled in Ethiopia, Uganda, Ghana and Nigeria throughout the summer. Needless to say, individual and corporate contributions – and the continued support of FedEx and the ISTAT Foundation – will enable ORBIS to reach thousands more children and adults before they forever lose their sight.

ORBIS continued next page

A Quarter Century of Saving Sight

ORBIS was created by a group of doctors, philanthropists and aviators, who came together in Houston, Texas to address the problem of avoidable blindness.

Betsy Trippe DeVecchi, daughter of Juan Trippe, founder of Pan American Airways and A. L. Ueltschi, founder and chairman of FlightSafety International, were among the aviation leaders inspired by Dr. David Paton, a Houston ophthalmologist who pulled ORBIS together in the 1970s.

In 1980, United Airlines donated a DC-8 aircraft to serve as the world's only Flying Eye Hospital. It completed its first program in Panama in 1982. Ten years later, the DC-8 was more than 30 years old, and replacement parts were becoming more difficult and expensive to obtain. ORBIS programs also were expanding in scope, and it became clear that a newer, larger aircraft was needed to replace the ORBIS DC-8.

In 1992, ORBIS purchased the DC-10. It was the second DC-10 to roll-off the McDonnell Douglas assembly line, and the company used it on marketing flights, which kept its mileage low.

After spending two years transforming the DC-10 into a mobile ophthalmic unit, the ORBIS DC-10 took off in 1994

RECOVERY ROOM photo Kiran Ridley

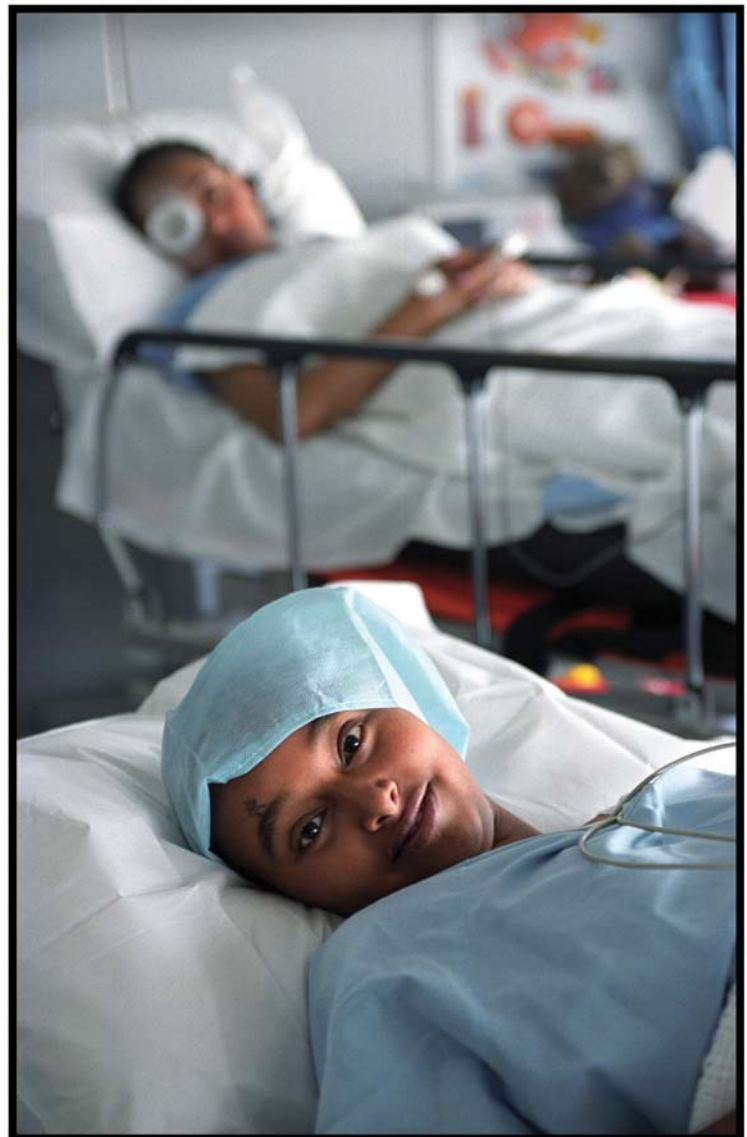




photo Kiran Ridley



ORBIS continued

and the original DC-8 Flying Eye Hospital was retired. It is currently on display at the Aerospace Museum in Beijing.

Recognizing that the campaign against avoidable blindness required more comprehensive solutions, ORBIS established the first of its long-term country programs in 1998. Today, major ORBIS blindness prevention efforts are underway in five priority countries – Bangladesh, China, Ethiopia, India and Vietnam, and regional programs are progressing in Eastern Europe, Latin America and the Caribbean.

No longer limited to an airport or local hospital, ORBIS entered cyberspace in 2002 with our telemedicine initiative, Cyber-Sight, linking expert ORBIS volunteer ophthalmologists with doctors around the world via the Internet, thus creating an extended presence for training, mentoring and patient care consultation.

ORBIS has worked in 84 countries to restore sight to the blind and to transfer sight-saving skills to more than 93,000 doctors, nurses and other eye care professionals. They have in turn gone on to give an estimated 22.5 million people back their sight and their future.

To learn more about ORBIS or to make a donation, visit www.orbis.org or call 1-800-ORBIS-US.



photo Jonathan Cr

Large Regional Jets— The Next Battleground

By Steven T. Gaal – Managing Director & COO, SkyWorks Capital LLC
and Arif Husain – Vice President, JetWorks Leasing LLC

Prior to the early 1990s regional aircraft were synonymous with turboprop and piston operators. In 1991, Bombardier sowed the seeds of the regional jet ("RJ") revolution by introducing the CRJ-100. By the middle of the decade, the CRJ-200 and its contemporary, Embraer's EMB-145, had begun to propel the regional airline industry into the jet age. Passenger preference for jet aircraft aided the cause of the RJ as regional airlines and their 'surrogates', faced with the choice of operating RJs or potentially losing market share, placed large orders for Bombardier and Embraer RJ aircraft, among others. Recently, however, the airline industry started to witness a paradigm shift. The 'small RJ' era, which saw the introduction into service of approximately 2,000 regional jet aircraft over a 10 year period, appears to have rapidly matured, paving the way for a new battleground – competition with Large RJs. (For purposes of this article, 'Large RJs' will be a term of convenience used to refer to in-production aircraft models with 51-110 seats; however, the authors believe that the lines begin to significantly 'blur' between RJ aircraft and narrowbody aircraft for a number of types falling into this category, particularly given mission capabilities and seating capacity).

Birth of the Regional Jet

The introduction of the RJ (primarily 50-seat aircraft) in the early 1990s started a revolution that rapidly spread through North America and Europe. By the end of the decade, 50-seat jet aircraft (and similar variants) played a vital role in reinforcing the 'fortress hubs' of network carriers, and became the preferred platform to provide feeder traffic to these hubs. For this ascension to the top of the regional aircraft hierarchy, RJs (both Bombardier and Embraer aircraft) owe a large part of their success to two phenomena – labor arbitrage and pilot scope clause relief. On the one hand, since a vast majority of RJs were operated by regional carriers at significantly lower labor rates, RJs became a more cost effective tool in the hands of network carriers; on the other, continued expansion of scope clause relief enabled network carriers to increasingly outsource the operation of 50-seat aircraft. There was also a third catalyst for the wide scale adoption of regional jets – the availability of favorable direct and indirect financing support from the regional jet manufacturers and other 'interested parties'.

Today, network carriers are continuing to adapt their business models to cope with record high fuel prices and increased competition from low-cost carriers. In particular, the high relative fuel consumption of 'small RJ' aircraft coupled with continued pressure on unit revenues from low-cost carriers is shifting network carrier preference for incremental capacity and a portion of previously deployed regional jet capacity to larger jet aircraft that offer lower unit operating costs. For similar reasons turboprop aircraft are also enjoying increased relative demand, particularly for use in shorter haul (typically sub-500 nm) segments.

Labor Cost and Scope Clause Restructurings

In the post 9-11 era of out-of-court restructurings and bankruptcies, cost containment is a pivotal issue on which network carriers have staked their future. From 2002 through 2005, the nine largest network airlines in the United States (excluding Southwest) posted combined operating losses in excess of US\$ 20 billion. To help stem losses and increase competitive standing, U.S. network carriers have sought a combination of increased scope clause relief and more dynamic wage structures – the objective being to competitively operate new aircraft models in the 51-110 seat segment, which had turned into a relative 'void' as carriers pursued the wide-scale retirement of their older aircraft types. Northwest and Delta are the latest network carriers pursuing competitive crew cost structures with which to operate Large RJs.

We view the actions being undertaken by Northwest and Delta to restructure labor costs, as well as the establishment by US Airways of a 100-seat pilot scale closely approximating that of JetBlue's, as having enormous strategic implications for the industry. An intense competitive environment coupled with attaining a certain threshold of deployment of a given aircraft type/category can lead a fleet planner into making a decision that arguably falls under the subject matter of game theory. Specifically, the risk of being left behind quickly becomes more untenable than following suit with others – even if it is probable that any competitive advantage will be short-lived since most or all competitors will make the same decision.

With 20/20 hindsight it would appear that the extent of the 50-seat regional jet phenomenon was driven in part by this type of dynamic. It is our belief that the large regional jet segment could experience a similar phenomenon within a 3-5 year period as competitors seek to maintain a level playing field. We hold this view most strongly for the 80-110 seat segment, since aircraft falling within the 51-79 seat segment are subject to some degree of competition from 50-seat RJs to the extent such aircraft are available at the current market lease rates estimated by most appraisal firms.

Introduction of Large RJs

Labor cost restructurings and the easing of pilot scope clause restrictions in themselves are significant developments, but for the industry to undergo a discernible change that could be classified as a paradigm shift, another key ingredient is required – the aircraft! The actual success of a particular aircraft – as well as of a type-category more generally – hinges on how competitive the operating economics are on both an absolute and relative basis. Our analysis indicates that certain large regional jet aircraft types currently offered by Bombardier and Embraer – coupled with competitive wage scales that did not exist just several years ago – provide operating seat-cost economics that are within a few percentage points (under certain assumption sets that we view as reasonable) of certain popular narrowbody aircraft models currently in production.



Steven T. Gaal



Arif Husain



Opportunity for Large RJs

A look at the U.S. domestic airline market indicates that a substantial percentage of markets are relatively smaller sized (particularly if competition is assumed in a reasonable number of the markets). Additionally, the majority of U.S. markets are within the range capability of the Bombardier and Embraer large regional jet products (roughly 2,000 nm, give or take). Based on our analysis, we believe that the market opportunity for Large RJs is up to 80-85% of passenger demand in the top U.S. domestic markets (see figure 1).

Distance	100-400	400-700	700-1000	>1000
>2000	6.3%	3.5%	3.0%	2.2%
1500-2000	5.2%	3.4%	1.8%	1.6%
1000-1500	6.5%	5.7%	3.8%	4.8%
500-1000	12.6%	6.7%	5.3%	8.0%
250-500	6.1%	3.3%	3.3%	2.5%
0-250	1.6%	0.6%	0.6%	1.7%
	Market Size by PDEW			

Figure 1 – U.S. Domestic Daily Passenger Travel

The actual penetration is likely to be much lower than this range and will depend upon multiple factors. Nonetheless, the ability to deploy Large RJ aircraft at relatively competitive unit costs and low break-even passenger levels should prove to be an attractive value proposition for many carriers. Longer-term, the U.S. as well as Europe should continue to experience the shifting of capacity from hub & spoke to point-to-point service as part of the long-unfolding deregulation of the industry. We believe that this continued shift drives growth in the number of carriers serving particular markets and growth in the connecting of new city pairs – factors that we believe will also lead to long-term carrier preference for smaller shell sizes for some material level of markets served.

In assessing the probable supply/demand characteristics for Large RJs it is also interesting to note that only about 10% of the worldwide operating fleet of Western-built regional jet and narrowbody aircraft fall into the 61-100 seat segment, and that approximately three-quarters of these aircraft are out-of-production models (such as Fokker 100s, DC-9-30s, etc). We believe that the relatively few number of 'modern' aircraft falling into this seat category combined with the positive economic fundamentals previously discussed indicate favorable long-term positive demand for aircraft falling into the 61-100 seat segment.

Large Regional Jets – The Next Battleground

As previously discussed, the industry's evolution towards Large RJs is well grounded in terms of operating economics. Historical patterns indicate that labor agreements at the network carriers will continue to restructure in a manner which ensures that most carriers will not enjoy too great of a competitive advantage over their peers. If this pattern holds, the potential operator base that can 'competitively' operate Large RJs (i.e., through outsourcing or by operation with

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mainline crew at reduced pay scales) should substantially widen. These changing industry dynamics pave the way for the wide-scale penetration of Large RJs over the long-run.

Based on the foregoing views presented in this article, we expect the following three trends to emerge in the airline industry:

- ✧ Network carriers increasingly deploy Large RJs (predominantly with 80-110 seats) to enhance competitiveness in certain markets;
 - ✧ Regional carriers concentrate their growth on Large RJs (predominantly with up to 79 seats) on behalf of network carriers and potentially some LCCs; and
 - ✧ Additional LCCs operate Large RJs (predominantly with 80-110 seats) to tap thinner markets or to compete more effectively in highly contested markets.
- ✧ First Wide-Scale Deployment of the Large RJ by a Low Cost Carrier

If ever the Large RJ needed a high profile 'flag bearer' to trumpet its capabilities, it found one in JetBlue, which deployed the first of its EMB-190s in October 2005. The growth of this fleet type by JetBlue might just be the catalyst the Large RJ (in particular, models in the 80-110 seat category) needed to tip it from a viable idea to an



industry phenomenon. Although JetBlue has experienced some 'hiccups', these appear to be normal 'teething' issues similar to those experienced on certain of the most popular narrowbody aircraft types in worldwide service today. Some industry analysts believe that JetBlue will suffer a competitive disadvantage from introducing a second aircraft type into its operations. It is our view that David Neeleman's 'crystal ball' – which has had an outstanding overall track record throughout his career – should not be discounted too quickly this time around!

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More information on SkyWorks and JetWorks can be found at www.skyworkscapital.com and www.jetworks.aero.



Dear Friends,

Our recent effort to support humanitarian causes has taken the ISTAT Foundation in new directions. As we look for ways to alleviate suffering in the world, we have learned that many of our members share our commitment to this cause.

Our guiding principal is simple: We want to use our knowledge and control of aviation assets to deliver humanitarian aid to those places in the world that need it most.

There is no better example of this than the ORBIS Flying Eye Hospital. FedEx and United have contributed enormous "in kind" value to ORBIS since 1982. Royal Bank of Scotland raised over \$250,000 for Orbis through their Flight to Sight Balls in 2004 and 2005. This combination of financial and "in kind" assistance from ISTAT members is truly powerful.

I hope this wonderful letter from Captain Dyson will help to generate excitement among ISTAT members for ORBIS and other humanitarian causes that we may identify in the future.

Best regards,
Bob Brown



photo Robert Bell



It was gratifying to see more overseas ISTAT members sitting the exams at Orlando; with a record number of successful candidates this year it was a 50/50 split between the US and UK.

The successful candidates are as follows:

Certified Senior appraiser Fred J. Klein, Aviation Specialists Group, Inc. US
John Trevitt, Mach Two Ltd/Flight Safe Consultants, Ltd. UK
Certified Appraiser Anthony Brooks, Airclaims, Ltd. UK
Bryant E. Lynch, Boeing Capital Corp. US
Jonathan McDonald, IBA Group, Ltd. UK
Stuart Rubin, Aviation Specialists Group, Inc. US

This brings the total of certified appraisers to 31, and those who have advanced to the senior grade to 11; it is from the latter group that the chairman of the Appraisers' Program International Board of Governors (IBG) and its two appraiser members are elected. The five non-appraiser members are elected by the ISTAT board members from a cross section of the other various professions represented in the ISTAT membership as a whole. This majority ensures that the IBG is not a self-serving body.

On occasion we have been asked just how difficult are the questions in the exams? Well it is not easy to qualify to sit them in the first place. For the appraiser grade, at least five years full time in aviation-related business, of which two full years must be spent in doing aircraft appraisals. For the senior grade, it is seven years of full time employment of which six years must be on appraising aircraft. The term aircraft includes spare parts, engines, simulators and ground support equipment.

In addition to the foregoing, candidates must submit to the appraiser members of the IBG two full appraisal reports he or she has written; they must have personally participated in the aircraft's inspection and on-site review of the maintenance records for one of these reports. When the reports have been accepted as meeting standard, then the candidate can sit the exam.

How do the candidates overall fare in the exams? From my data base here is the failure rate of all the four-hour long papers written since the start of the process in 1988:

Technical, 30 percent; Ethics and Methodology, 36 percent;
Appraisal report, 64 percent; Senior exam; 37 percent.

Candidates can re-take the failed papers the following year.

ISTAT Appraiser Certification Exams March 25-26, 2006 Orlando

By Bill Bath

Steve Iverson, of Jetrader, requested that a representation of the exam questions be included in this piece for the non-appraiser readers to answer. The results (no names) will be published in the Jetrader, so send them to Steve and copy me.

Ethics: "Appraisal assignments are normally kept confidential. Cite at least two exceptions to this rule".

Senior Exam: What are the five principal constituents of turbine engine exhaust gases, and which of these are possible targets to meet pollution control standards?

Appraisal report: Besides correct calculations to determine the current value estimates and forecast of future values; to attain the 80 percent pass mark for this exam the report must include specific statements, explanations and descriptions. What are they?

Answers to these questions will be published in the next issue of Jetrader.

The ISTAT Appraisers' Program appraisal report standards follow those set by The Appraisal Foundation's Uniform Standards of Professional Appraisal Practice (USPAP). Although a private entity its standards are recognized by Congress through the Savings & Loan Bail-Out Bill of 1989. The key was to ensure that the professional appraiser has an ethical obligation to act in behalf of the public interest, and not out of self-interest.

⊙ The above group photo of the appraisers' briefing was taken at Airbus, Toulouse on May 16-17. There were 21 of us, including Simon Finn of Airbus (on left) who was the coordinator; he is an ISTAT Certified Appraiser.

Development of the Jet Engine

When I started to research the development of the jet engine by Frank Whittle of England and Hans von Ohain of Germany in the 1930s, I was struck by the similarity of the competition between these two brilliant engineers and that between Isaac Newton and Gottfried Leibnitz in the invention of calculus during the seventeenth century. Newton invented calculus in the mid-1660s but did not bother to tell anyone at the time; a little later Leibnitz came up with the same idea independently but his was a more easily understood version. With the exception of this latter point, so it was with the invention of the jet engine.

Frank Whittle's patent for the aircraft jet engine was granted in 1931 and widely published, including by the German magazine *Flugsport*; however, a few years later he could not afford to pay the £5 renewal fee and the patent lapsed.

In 1935 Hans von Ohain had just received his Ph.D in physics and aerodynamics when he patented his design of a jet engine; this patent was classified secret and like the Whittle design also had a centrifugal compressor, but instead of turbine blades, used a centrifugal disc with the hot gas flowing through it in reverse from the rim towards the hub. He visited Ernst Heinkel's factory in March 1936; after a long hard grilling from the engineers, and showing photos of his design of a small working model built in his home by his garage mechanic, they agreed to try and develop a full size engine.

In the same month Whittle founded Power Jets Ltd. to build and test a jet engine. An unconventional London investment bank, O.T. Falk provided the funds; a senior partner was a philosopher and intellectual who had worked in theoretical physics at Cambridge and had had discussions with Albert Einstein, as well as becoming friendly with Max Born and attending Neils Bohr's lectures. His name was Lancelot Law Whyte, and he described later how upon meeting Whittle for the first time the impression was overwhelming; it was genius not talent – a stunningly simple idea with one moving part. He went on to say that it was like meeting a saint in an earlier religious epoch; a single-minded personality born to a great task.

With a £5,000 contribution from the Air Ministry, Power Jets was established in an old disused foundry near Rugby in the English Midlands and the prototype jet engine made its first successful run on April 12, 1937, one month after the Heinkel engineers ran their first Ohain engine using hydrogen.

Being also an airframe manufacturer, Heinkel was ready to fly an aircraft, the He 178, in August 1939 with a much improved von Ohain engine running on gasoline in which machined parts replaced many that had been fabricated from sheet metal. Twenty one months later the British flew the Gloster E28/39 in May 1941, just as the Battle of Britain was about to commence. On its first flight the He 178 flew at a maximum speed of 360 miles per hour with the engine producing 838 pounds of thrust; with the Whittle W.1 engine the E28 attained a speed of



Pictured Sir Frank Whittle, left, with Dr. Hans von Ohain in 1978

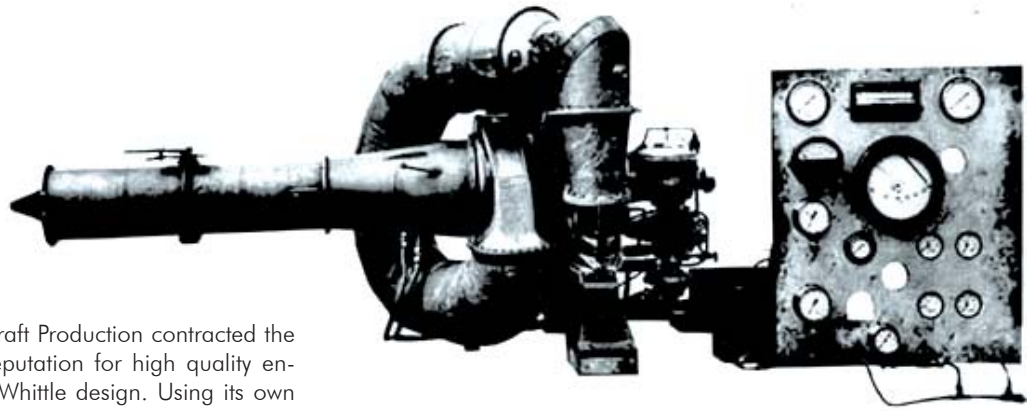
338 mph with a thrust of 860 lbs on its first flight. The faster Heinkel had its landing gear locked down for the eight minute flight and both aircraft progressively flew faster as improvements were made to the engines. The Heinkel attained a maximum speed of 435 mph and the E28 was clocked at 466 mph, and a range of 410 miles. Interestingly the E28 had provisions for two .303 machine guns but these were never fitted. In 1941 Heinkel flew the world's first twin jet, the He 280; its top speed was in excess of 570 mph.

Von Ohain's engine was never installed on a Luftwaffe combat aircraft; the HeS 8, a more powerful design had severe development problems, whereas the Junkers Jumo 004 axial compressor design was making good progress; it was this engine which was adopted for the Messerschmitt Me 262. This twin engine fighter entered squadron service in June 1944 one month before the twin engine Gloster Meteor, powered by the Rolls-Royce Derwent engine (2,000 lbs of thrust each).

How did Rolls-Royce get to produce the jet and not Whittle? This is a long and convoluted story; briefly, Power Jets had no production facilities and was having trouble producing more power given the 180 degree turn from the compressor into the combustion cans so that its new W. 2 design was stalled. This design made for a short and rigid engine to prevent destructive shaft whirling (like a skipping rope). Also the compressor impeller was bursting at its 18,000 rpm operating speed; General Electric in the US had solved that problem with its turbo superchargers for piston engines and shipped to Power Jets the impellers it was using in its copy of the engine. The design had been given to the US, together with radar, as part of the allied war effort.

V Sir Stanley Hooker; former chief engineer of Rolls-Royce once said, "the four-stroke piston engine has one stroke for producing power, and three for wearing it out. By contrast, the jet engine produces power continuously").

Frank Whittle's first experimental jet engine, 1937



In 1940 the Ministry for Aircraft Production contracted the Rover Car Company, which had a reputation for high quality engineering, to produce a flight-worthy Whittle design. Using its own engineers, the 180 degree turn was eliminated, giving a straight through air flow from the compressor to the combustion chambers. When Whittle heard about it he was furious. Ernest Hives, later the head of Rolls-Royce as Lord Hives, apocryphally remarked that "as we are giving so much information to the Americans we might as well give it to each other".

Relations between Whittle and the Rover Engineering group deteriorated to the point that Rover's chairman, S. B. Wilkes called his friend Hives, then the general works manager and a director of Rolls-Royce, who had started work there as a mechanic and chassis tester. They had lunch in a favorite pub in the village of Clitheroe near the Rover Barnoldswick test facility for the engine; a brief discussion ensued over the situation and Hives proposed that Rover turn over the jet engine work to Rolls-Royce, and in turn he would give Rover the tank Merlin engine factory at Nottingham. The deal was as simple as that.

Frank Whittle entered the Royal Air Force as a boy entrant, with training in the various airman ground trades; from the several hundred apprentices he was one of five selected for officer training at Cranwell and passed out second in academics and exceptional as a pilot. His thesis was on the subject of the internal-combustion gas turbine; he had so impressed his superior officers that he was sent to Cambridge for a degree in mechanical engineering, at which time he started to give serious thought to jet engine design. For thirty years, aircraft piston engines performance in flight were calculated on inaccurate empirical formulae; Whittle's jet engine performance formulae, created before he even built one, is still in use today, and are so precise they are frequently more accurate in calculating performance than in-flight measurements between take-off and Mach two. In his biography Sir Stanley Hooker relates how Whittle had calculated his compressor design for the W.2 engine would be 80 percent efficient; when Rolls-Royce tested it at 18,000 rpm its measured efficiency was 79 percent. Hooker continues how he considered himself one of the world's experts on centrifugal compressors, but after discussing them with Whittle for a few minutes he realized he was talking with his master.

Whittle went to live in the United States in 1976, and was on the faculty of the Naval Academy at Annapolis. While there he met von Ohain who was living in Florida and eventually they became good friends. von Ohain was brought to the US in 1947 by Operation Paperclip and worked at Wright-Patterson Air Force Base; by 1975 he was the Chief Scientist of the Aero Propulsion Laboratory there. He died in March 1998; Sir Frank Whittle died in Maryland at the age of 89 in August 1996.

End Note: Most of you know that the DeHavilland Mosquito was made mainly of wood; did you know the He 178's wings were wood, and that an all wood jet fighter, the He 162 was in production? It was built by unskilled workers, mainly prisoners, and destined to be flown by very young glider pilots! At the end of the war 116 had been delivered to the Luftwaffe and 800 were on the production line; the RAF sent 11 to the UK for close examination, seven went to France and two to the USA.

Von Ohain's engine, a type of "axial flow", with intake at left and jet gas exit at right.



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by Bert van Leeuwen, DVB Bank

BIG Moves

DVB Bank establishes DVB Capital Markets LLC

DVB Bank formed DVB Capital Markets LLC, a U.S. registered broker-dealer. William J. Abrams has been appointed Managing Director. DVB Capital Markets registered with the U.S. Securities and Exchange Commission as a broker-dealer and a member firm of the NASD in April 2006.

Senior management changes in DVB's Aviation Finance team

DVB Bank AG announces that Frank Wulf will relocate to London to take up the position of Regional Head of Aviation 'Europe, Middle East & Africa'. Mr Wulf served as Regional Head of Aviation 'Asia/Pacific' and as Deputy Managing Director of DVB's wholly-owned subsidiary DVB Group Merchant Bank (Asia) Ltd in Singapore. In Singapore, Vicente Alava Pons, a Senior Vice President in the Singapore Aviation team, will be promoted to succeed Wulf as Regional Head of Aviation 'Asia/Pacific' with effect from 1st August. DVB has hired aircraft finance specialist Silke Tipper (nee Richter) to join the Bank's Aviation Finance team in London.

Stephan Sayre to head DVB Bank's Deucalion Fund

DVB Bank AG announced that Stephan Sayre will join DVB in London as the new head of the Deucalion Fund with effect from July 13th, 2006. Stephan joins DVB from RBC Capital Markets in London where he held the post of Managing Director, Global Debt Markets.

A J Walter Aviation appoint Business Development Manager

A J Walter Aviation have appointed Matthew Millbank as Business Development Manager for the Company. With over 20 years experience in the industry. Matt manage and maintain long-term customer partnerships for aircraft spares support and maintain new business.

Monaco and Commercial Aviation are not a very obvious combination, but with the upcoming ISTAT 13th European Conference from 5-7 October there is enough reason to highlight some of the attractions of "La Principauté de Monaco".

Monaco is composed of five neighborhoods, each with its own character: · Monaco-Ville: the Principality's historic seat which dominates the town from the Rock; · Monte-Carlo: founded in 1866, during the reign of Prince Charles III, this area is built around the Casino; · La Condamine: the area surrounding the Port Hercule, the place to see some of the world's mega yachts; Fontvieille: this new industrial area built on land reclaimed from the sea; Les Moneghetti: the area around the Jardin Exotique, the Mediterranean botanical garden.

Monaco-Ville is centered around the Place du Palais. Lined with batteries of cannons, the Place du Palais offers a unique panoramic view overlooking the Port and Monte-Carlo, stretching as far as Bordighera in Italy and Cap-d'Ail to the south-west. Every day at 11:55 AM sharp, in front of the Palace's main entrance, the guard ceremony is performed by the "Carabiniers" in full dress uniform. East of the Place du Palais are the narrow streets of the Old Town.

In Monte Carlo, the Place du Casino is the main attraction. Dress code is jacket and tie for men. Also on Place du Casino stands the world's first and grandest Old World Hotel, built in 1864, "Hôtel de Paris". This nineteenth century "palace" is owned by the Société des Bains des Mer and has been home to royalty and many of the world's best known celebrities.

Perhaps the Casino and Hotel de Paris are best known to many ISTAT members all over the world as part of the scenery of the Grand Prix de Monaco for Formula 1 cars. Held for the first time on April 14, 1929 the GP de Monaco is perhaps the most prestigious motor-racing event in the entire world. From experience we know that there are many motor-sports affectionadoes amongst the ISTAT membership, driving (or maybe better) walking part of the Grand Prix track may be an attraction of its own.

Practical Information Monaco does not have an own airport apart from a heliport. Nice-Côte d'Azur International Airport is a 30-minute drive. An attractive alternative is to take the helicopter. Heli Air Monte Carlo takes you in approximately 7 minutes from Nice Côte d'Azur Int'l Airport to the Principality of Monaco. Daily flights depart every 20 minutes and the average rate is 95 € one-way, per person. Any person of foreign nationality who wishes to enter Monégasque territory must have the document required for entry into French territory. French is the official language, however, English and Italian are widely spoken.

Where to Stay. Clearly, with the ISTAT conference held in Le Meridien Beach Plaza, this must be the place to stay during the conference. Le Meridien Beach Plaza is the only hotel of the Principality to own a private beach, 3 swimming pools and conference center "Le Sea Club", which is considered as one of the most stunning conference centre in Europe and is able to accommodate up to 2000 people. A – maybe less convenient - alternative to Le Meridien of course could be the Hôtel de Paris. This hotel connects directly to Les Thermes Marins seawater spa. It is acclaimed for its savoir faire and gourmet dining, with 3 restaurants including Alain Ducasse's *** Louis XV, and rooftop Grill. The Hôtel de Paris's also has a celebrated wine cellar and salons.

Where to Eat. Apart from the Hôtel de Paris, Monaco has everything from Tex-Mex to Japanese, from sublime dining in the Louis XV to portside cafés. Be sure to try some of the Monégasque specialties like barbagiuau, a delicious tidbit of rice, spinach, leek and cheese, served as an appetizer. Current favorites for "lite snack" sandwiches are toasted paninis, focaccia, and open faced bruschettas found in the Old Town. During the ISTAT Conference, however the organisers have secured even more exclusive dinner and reception locations. With the farewell reception at the Oceanographic museum, the mood may be set for a fine seafood dinner. Inaugurated in 1910 by its founder, Prince Albert I, this exceptional museum of marine sciences is a monumental architectural masterpiece with a façade rising majestically above the sea to a height of 279 feet. After that, dinner will be served in "H.S.H. The Prince of Monaco's Private Collection of Classic Cars"-museum. Apart from about 100 vintage Bugatti's, Rolls Royces etc. the collection features some winners of the Monaco GP.

So, while Monaco may lack major aviation attractions, there is an abundance of other "Toys for the Boys (and Girls)". Classic cars in the museum, mega-yachts in the Port of Monaco and super sports cars and limo's around Place du Casino, should provide sufficient entertainment to make this one of the most exciting venues for the ISTAT conference ever.

An abstract painting featuring two stylized human figures in the foreground, rendered in vibrant red and orange with vertical brushstrokes. To the left, a tree with a yellow-green trunk and purple and green foliage stands on a green hill. The background is a deep blue sky with dark, swirling clouds. The overall style is expressive and modern.

ISTAT 13th European Conference

5 - 7 October 2006
Le Meridien

Monaco