

April 2007

ISTAT

Jetrader

International Society of Transport Aircraft Trading

ISTAT 24th Annual Conference

Phoenix

Q + A

Wolfgang Mayrhober
Deutsche Lufthansa AG

Asian Aviation Big Growth, Big Challenges

Flying in the Queen of the Sky



Success flies on the CRJ900

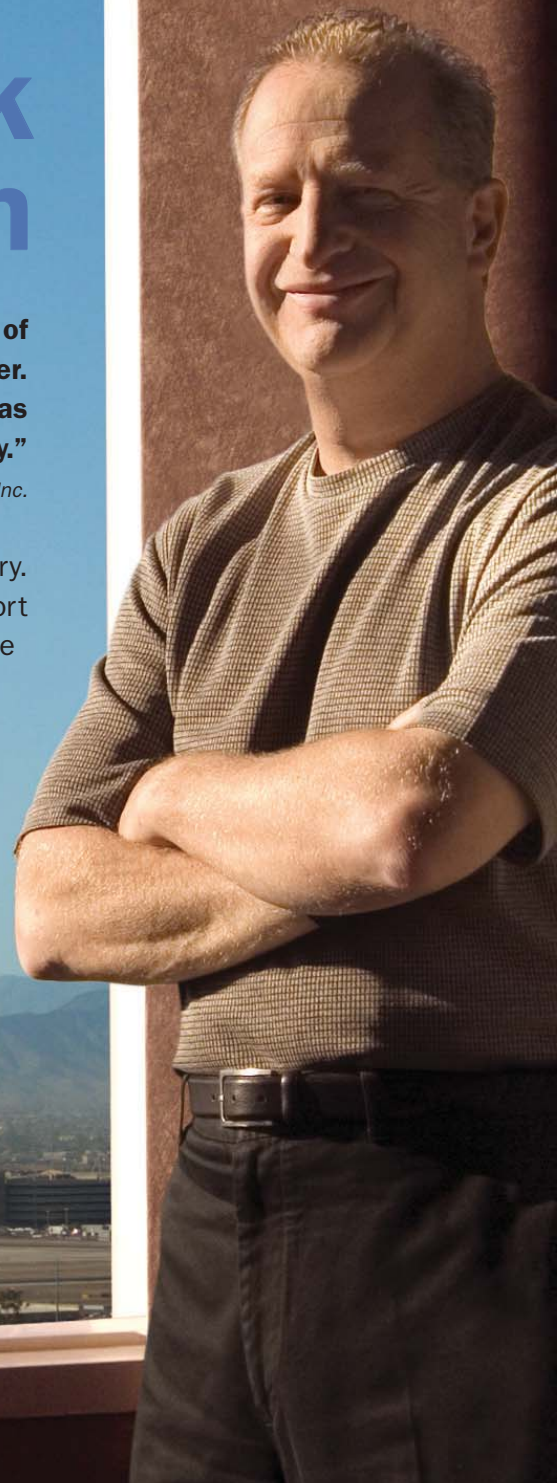
Just ask Jonathan Ornstein

"I don't think there's any doubt the CRJ900 has the best economics of any of the large regional jets. The fuel costs alone are 10-12% lower. Our success is based on reliability and low cost, and Bombardier has played an important role on both counts. The CRJ900 works for everybody."

Jonathan Ornstein, Chairman and CEO, Mesa Air Group, Inc.

The Bombardier CRJ is the most successful regional aircraft program in history. And the CRJ900's low operating costs, excellent performance and comfort have helped Mesa Air Group to become one of the most cost-competitive airlines in the United States. www.crj.bombardier.com

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I have the honor and privilege of assuming the ISTAT presidency at a very exciting time in our industry. Business is good. Airlines are finally making money. Manufacturers' backlogs are at an all time high. Leasing and finance companies are springing up, merging, going public and relocating, and portfolios are being securitized.

At the ISTAT 24th Annual Conference in Phoenix, we hosted 1,000 attendees, a new record. Of the 1,000 attendees, 192 hold the title of CEO, COO, President or Senior Vice President. That is a lot of top-level decision makers in one room. Since increasing international membership and awareness of ISTAT is one of our association's key goals, I am also pleased to report that 238 of our delegates were from outside the United States. In addition, 25 airlines were represented in Phoenix.

Although many of you were in Dublin and Geneva just a few weeks prior, you keep the ISTAT annual conference on your calendar because you know we put on a great show and bring together the right strategic partners. John Vitale, Chairman of the 2007 Conference Committee, did an outstanding job lining up top industry experts to share their views with our members. The week after our event, attendees also received a survey, seeking thoughts and suggestions on the conference, and how we can make it even better. We ask because ISTAT belongs to you—the members we serve.

If you are so inclined, you could probably spend most of the year attending aviation conferences. We are inundated with brochures and e-mails advertising the "must attend" conferences that take place around the globe on a weekly basis. The ISTAT Board of Directors addressed this issue, among many others, last January when we spent an entire day with a professional strategic planning moderator thinking about what makes ISTAT unique, valuable and relevant to you, our members.

ISTAT is not a conference production company. We are a not for profit, membership-driven organization that creates educational, networking and philanthropic opportunities for our members. At our strategic planning session, we recognized the value of the ISTAT appraisers program and determined that it is important to make sure our members appreciate the rigorous standards that ISTAT certified appraisers must attain to earn the ISTAT designation. We focused on our goal of selectively increasing our membership to include more international members and more airline members. We talked a great deal about providing additional member benefits and we worked on defining the respective roles of our officers, Board, Executive Director and professional staff. These are just a few of the initiatives we will explore to make ISTAT even better, moving forward.

When the ISTAT 24th Annual Conference opened and I saw 1,000 of you gathered in the ballroom, I realized that while we are doing many things to make ISTAT even better, our association is already in great shape. Perhaps the most satisfying thing about the conference was seeing small groups of attendees gathered in the foyer, hallways, hotel lobby and outdoor tables exchanging business cards, shaking hands and making deals. That's what our conference is all about—bringing together our members and key industry executives in an environment where business gets done.

In the coming year, the Board will work on a number of new initiatives, all started by our Immediate Past President, Tom Heimsoth. We are creating a new database and Web site. We are working on our first Dubai Air Show reception. We will also launch a series of manufacturer forums, with the first scheduled at Embraer in May 2008. On behalf of all ISTAT members, I thank Tom for the countless hours he has dedicated to making ISTAT what it is today and for positioning us to grow even stronger in the future.

There are plenty of opportunities for our members to get involved in ISTAT and in the ISTAT Foundation. All it takes is one phone call or e-mail to any of our Board members, listed on www.ISTAT.com and in your membership directory. I promise you won't regret it!

Michael Platt



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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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International Society of Transport Aircraft Trading

Ron **Pietrzak**, Executive Director, rpietrzak@ISTAT.org
 Ben **Barclay**, Project Coordinator, bbarclay@ISTAT.org
 Dana **Henninger**, Member Services, dhenninger@ISTAT.org
 401 North Michigan Avenue, Chicago, Illinois 60611 USA
 T +1 312-321-5169 F +1 312-673-6579
 E ISTAT@ISTAT.org W www.ISTAT.org

A/E art /editorial content / advertising sales

Barbara **Rogers** . Stephen **Iverson** publishers
 Ajax News . 1060 N Union Street . Gary IN 46403 USA
barbara@ajaxnewservice.com
stephen@ajaxnewservice.com T +1 219 939 9581

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iSTAT Calendar

18 June 2007

Paris Air Show Reception

Pre-Catelan *by invitation*

30 September - October 2 2007

14th European Conference

Hilton Vienna

11 November 2007

Dubai Air Show Reception

Dubai Creek Golf & Yacht Club

9 - 11 March 2008

25th Annual Conference

Omni Orlando Resort at Championsgate

A Tribute to Mike Metcalf

On Saturday, February 17, 2007, Broward Community College celebrated, at a ceremony during its annual "Wings, Wheels & Waves" event, the dedication of a former FedEx B727-100 Freighter aircraft (MSN to the memory of the late "Commander Mike Metcalf". Mike was ISTAT's president from 2003 to 2005 and passed away last year. A long-time Ft. Lauderdale resident, he was instrumental in arranging, with David Sutton, FedEx's managing director of aircraft acquisitions & sales, for the donation of the retired aircraft to BCC.

More than \$15,000

has been raised by the ISTAT Foundation for the Michal A. Metcalf Scholarship Fund. BCC student, George Fuentes, was presented with a \$5,000 scholarship from this fund by Roland Moore, chairman of the ISTAT Foundation's Scholarship Committee.

At the time of the event, Mike's wife, Diana, was in the hospital recovering from a fall. However, she and Mike were represented by Mike's daughter Michelle and Diana's sister, Kristin Carter.

Other ISTAT members attending the "Aviation Day" event at BCC's South Campus in Pembroke Pines, Florida, included Vito LaForgia, Vincent LaForgia, Jim McMillen, Ed Collins, Mark Ebanks, Gary Spulak and Andy LaStella.



Asian Aviation :: Big Growth, Big Challenges

By Torbjörn Karlsson

Asia's aviation sector is poised for strong growth but faces many challenges; strong leadership is essential in the coming years. Bangkok's new Suvarnabhumi Airport is a potent symbol of where things are going well in Asia's commercial aviation sector; and an equally potent symbol of where improvements can be made. Standing by the runway on any given afternoon, it is possible to observe carriers from all over the world landing and taking off, as well as dozens of aircraft belonging to low-cost carriers — Thailand has done an excellent job with open skies agreements, liberalization, and allowing foreign airlines to enter its market.

On the other hand, bureaucratic meddling has plagued Suvarnabhumi from its inception and it was opened years behind schedule. Poor planning resulted in a number of well-publicized problems that have yet to be resolved. Nonetheless, Suvarnabhumi and other modern airports in Asia are a testament to the major role aviation has played in Asia's development — and the even bigger role it will play in Asia's future.

On the surface, the opportunities available to commercial aviation in Asia are the same as those for other sectors: rising wealth, booming economies, and increasingly mobile populations. Low-cost carriers are firmly entrenched, particularly in Southeast Asia, and Asia is now witnessing the advent of low-cost carriers focused on long-haul routes, recognizing the disproportionate share of long-haul travel undertaken by Asian carriers. Hong Kong LCC Oasis started flying the Hong Kong-London route late last year and says it will start flights to Oakland, California this summer; Singapore's Tiger Airways is set to launch a Singapore-Perth service; and Malaysia's AirAsia has announced it too will enter the long-haul game. What's more, professional airport management is taking off throughout the region, leading to improved profitability at airports and better operating conditions for carriers.

In a presentation last November, Andrew Herdman, Director General of the Association of Asia Pacific Airlines (AAPA) gave some idea of the scale of the aviation industry in Asia — and its potential. He estimated that the combined 2005 operating revenue of airlines in Asia Pacific was US\$110 billion, with 340 million domestic and 70 million international passengers carried. Although Asia has well over half the world's population, AAPA puts Asia's share of global passenger traffic at just 28 percent.

But the skies ahead are not entirely clear. Asia is far from being a single, homogenous place. The political systems of the region's countries run the gamut from full-blown democracy to single-party rule. Protectionism is an issue in many countries, particularly in sensitive industries such as aviation — the region is probably 20 years behind Europe in terms of deregulating its aviation markets. Infrastructure is also an issue: World-class airports in cities such as Singapore and Hong Kong are offset by obsolete airports in cities like Manila and Mumbai.

The sector's strong growth and rapidly changing business models pose a challenge for industry leaders. In just 20 years, Asian aviation has gone from being a staid, cozy sector to a dynamic, innovative business where there is fierce competition for passengers, routes, and financing. Strong leadership is essential for coping with the challenges facing the sector. Asia's airline leaders need to appeal not only to stakeholders in their home base, but also reach out to stakeholders in far-flung destinations in other countries — particularly as public concerns about the environmental impact of aviation

growth. At the same time, safety is as important as ever. Keeping the correct balance between operational necessities and profitability is a balancing act worthy of the world's most talented managers.

Last month, former Air New Zealand CEO Ralph Norris (now CEO of Commonwealth Bank in Sydney) told Heidrick & Struggles that the skills airline leaders need today include "an ability to think outside the square and challenge conventional wisdom — and a strategic mindset." An examination of the challenges the industry faces throughout the region illustrates the importance of the strategic mindset Norris refers to.

Asia's future superpowers, China and India, have the potential to be the world's biggest aviation markets, but there is a long way to go. China's airport infrastructure is good, but it has yet to liberalize its aviation sector. Three state-controlled carriers dominate internal travel, and low-cost carriers have yet to appear. Only through greater competition will the quality of service available in China improve.

India has the opposite problem. Its infrastructure urgently needs expansion and upgrading, but its deregulated domestic aviation market has resulted in a dogfight between dozens of private carriers desperate to grow market share. Poor infrastructure compounds this problem: Scheduling, for example, is often determined not by business needs, but by issues such as where slots and parking are available. In the coming years, India's overcapacity is bound to result in a painful consolidation.

In Southeast Asia one finds the full spectrum of what is good and bad in the Asian aviation business. Thailand, Malaysia, the Philippines, and Indonesia have made good progress toward opening up their domestic routes to low-cost carriers, improving service and lowering costs. Some of these moves have been made at the expense of their flag carriers, but with the exception of Thailand they are still dubious about throwing open the door to foreign competitors. A limited ASEAN (Association of Southeast Asian Nations) open skies agreement is likely to be implemented in 2008, allowing flights between the capital cities of ASEAN nations, but flights between other cities won't follow until later.

Japan's aviation sector is making slow progress toward liberalization, but obstacles still remain. Infrastructure is prohibitively expensive there, and vested political interests have resulted in many airports being located too far from city centers. Startup airlines are starting to appear, although it will be some time before they present a serious challenge to the country's heavyweights, Japan Airlines (JAL) and All Nippon Airways (ANA).



Wolfgang Mayrhuber

Chairman of the Executive Board and
CEO Deutsche Lufthansa AG



JETRADER: Good Afternoon Mr. Mayrhuber. Thank you for talking to the JETRADER. I hope that you have enjoyed the magazine.

WM: Yes, particularly on long flights.

JETRADER: Then we have accomplished our purpose. Could we start with your view of fuel prices today, where you see them in the near future and their impact on Lufthansa?

WM: Well, as I am sure you are aware, we have been recognized for our fuel hedging policies. We participate in this market to limit our surprise with future fuel price increases or fuel price changes. We believe that as the world economy grows and with fuel resources struc-

urally limited in the short run, fuel prices reflect both a measure of speculative concern as well as an assessment of the risk of future fuel price changes. Lufthansa has a two-fold strategy to manage this risk; one is hedging and the financial structure that supports it and the second is the operational and technical management of this cost. We have the most modern airplanes, we maximize their operating efficiency and we focus on operating methods to reduce consumption. Finally the market decides ticket prices not us. We have to be diligent in working to lower our costs to remain competitive and not bet that fuel prices can be passed through to passengers.

JETRADER: What is the impact of the growing competition from the airline market fragmentation including competition from LCC's and their successors? What role do acquisitions play in Lufthansa long-term strategy?

WM: Well, our home turf is Europe and that is from where we base our growth strategy, which is the world. In Europe the airspace is comprehensive and congested, with the main market in the center. The periphery is much more lightly served. The US differs with traffic on the East and West Coasts, traffic between the Coasts and partially North South. In Europe the traffic is much more in the center with over 60% of traffic in flights averaging about one hour. How do we do it and who are our competitors. There are three global network carrier systems in Europe, British Airway and One World, KLM/Air France and Sky Team and Lufthansa and the Star Alliance. We have managed to develop a strong airline in Europe with a very dense and competitive feeder system. We have focused on lowering our costs and broadening our array of products. We target our customers by giving them mobility a la carte. We offer a full array of services from our no frills or low cost product as we call it, Germanwings, which competes in this segment. There is a firewall between the classical network carrier Lufthansa and Germanwings so that they can compete with each other. This way all of our business segments can best feel the market pressure. In a nutshell, we offer differentiation through quality, working with the densest network that we can organize by ourselves and with our partners, the Star Alliance. Therefore providing our customers the choice from low cost to private jet service. In the in the center of course is Lufthansa classical service.

JETRADER: What will be the impact of the Open Skis policy on Lufthansa? Has the US Bankruptcy laws given an unfair advantage to US Carriers seeking that route?

WM: I strongly believe that after the liberalization and deregulation in

the US and later in Europe and the subsequent bilateral agreements between the member states in Europe and the US, we have reached a status where we can say let's have an open market from California to the Urals, including Europe the North Atlantic and the US. In my opinion this could be a blueprint for an even playing field, an open market. We then could say let the market decide who is the best and this would create value for everyone. We cannot expect today that the South American, African or Asian markets, which developed later, are at a stage where they can be completely open. Eventually they should be open, as we don't want a fragmented and regulated world. So I see this as very positive. Now the negotiations have concluded with a compromise and the compromise is a right step in the right direction. It doesn't meet my personal expectations because they fall short. Given the demographical change in the world and the growth in Asia I think it would be prudent if Europe and the US could join forces to develop a better position in the years to come and show the world the way to go. But this is a compromise we can live with especially since our customers will benefit the specific element of one stop security. Recognizing comparable security standards from both parts of the world will reduce the hassles for our customers, which will be very beneficial.

JETRADER: How has the US Bankruptcy laws influenced Lufthansa operations.

WM: Chapter 11 did not help anybody. It was meant to give US carriers a chance to restart. Management was generally not able to take corrective action in due time because creditors, unions and other stake holders were unwilling to negotiate because they knew that in Chapter 11 they would have to give up everything. I believe more value would have been created if this regulation did not exist. It creates distortion in the US but it also creates distortion with competitors on a global scale. It is difficult to see companies in Chapter 11 be capacity and price leaders while extracting money from its workers, creditors and competitors. Chapter 11 is not the best regulation for the baseline of future development. I would not like to run my airline on the proposition that if we fail there is a shelter in Chapter 11. Our stakeholders know that we are in the loop or we are out, there is no golden parachute.

JETRADER: Could you address the issue of foreign ownership of US airlines?

WM: This too is a compromise. Living in Europe, I do not completely understand the reasoning and worries behind free capital markets and the anxiety of foreign ownership. The American economy has benefited immensely from free access to capital markets and foreign direct ownership with funds flowing into the US. I talk about BMW who would not have their second largest plant in Spartanburg if they could not control it. If you acquire an airline to shift jobs away from where you produce, this is wrong. I don't see European companies treating their employees in a way that should make Americans be afraid of their ownership.

JETRADER: How does Lufthansa manage a high cost structure with a variable revenue sources? How do you handle Euro costs and dollar revenue?

WM: Well this is a cocktail with many ingredients. We are in constant communication with our employees saying we cannot cost more than what we can sell. We should have the flexibility to adjust our capacity to demand. We cannot spend more than we earn. If price flexibility leads to fare reductions due to currency fluctuations, competition and other factors, it requires us to adapt our own costs structures. Our commitment to our employees is that we will reinvest a substantial portion of the revenue found from efficiencies. Our employees know that cost cutting does not lead to job reductions but to reinvestment that benefits all of the stakeholders in Lufthansa. So the company is focused on being more efficient today than yesterday and keeping our customers aware of the differentiated products we offer: a cheap

fare with limited flexibility and service or high mobility with superior service at a premium price. This has really helped us attract the premium customer.

As to foreign exchange issues, we sell on both ends, in the US and Europe. Our underlying philosophy is that we have to be competitive at whatever the exchange rate. Flying an airline is managing risks and we are pretty well balanced as to foreign exchange exposure. Managing our foreign currency exposure is what we try to do with the diversified businesses we have. As a result we have a natural hedge. JETRADER: What is Lufthansa fleet strategy? What is the role of leasing versus ownership in your company?

WM: It is very healthy to have competition and currently we have two suppliers for the 100 seaters and up and several suppliers for the smaller ones. We are big enough to make decision that make strategic and economic sense and do not feel that we have to commit to one supplier although this can change with time. The lease/own equation has several aspects. The first is that if you need flexibility to discard some of your fleet then leasing has its charm and in our case that is true. But as the lessors will tell you the fundamental principal is asset value retention. And since we have Lufthansa Technik as a wholly owned subsidiary we know that we can maximize the value of that asset. We also have an investment grade rating along with only two other airlines in the world so our cost of capital is not much different from a leasing firm.

So we manage our assets to maximize their value. We also manage our staff efficiently as this is a knowledge-based industry. It is good to have competition in suppliers, capital markets and we are dedicated to maintaining our flexibility. We work with many airlines that have a wide variety of equipment needs. As long as we have the financing flexibility and we can write off the value of assets we have the best operating environment. We demonstrated that when we grounded 77 aircraft after 9/11 that had been fully depreciated with an average age of 12 years old and reduced the work hours of our workforce until the industry recovered.

JETRADER: How does Lufthansa approach the war for talent particularly the management and financial expertise to run your business?

WM: As long as Lufthansa is perceived to be a valued employer we can find the people we need. Last year we had 97500 applications for 2500 hires. We are rated the third most sought after employer in Germany after Porsche and BMW and have a significant number of university hires. We have never had a hire/fire strategy and have the

flexibility to adjust employees work schedules as we have encountered turbulence. Our employees will decrease their work hours in moments of difficulties and repay that time when we are in need of extra help. We also have a ready pool of candidates trained by other companies who would really rather work for us. Finally we have a huge training capacity and spend much effort to train people inside of our organization and that gives us an even more flexible response to market conditions.

JETRADER: The ISTAT Foundation is actively developing an Internship Program for students interested in the Aviation Industry. Does Lufthansa have internship opportunities?

WM: Yes. We have a whole array of programs on an international basis where people can intern with us and we select the best. We also have a web-based program called intern@work to stay in touch with our interns even after they have left our organization.

JETRADER: What role does ISTAT play for Lufthansa and the aviation industry?

WM: ISTAT is the perfect platform for the various constituencies to meet and discuss the issues that will face the industry in the future, to share the experience of working in this industry and to take advantage of the many opportunities available. Not only for trading airplanes or moving the assets around but to discuss what we need to make this industry more attractive, more vital for all of the stakeholders employees, suppliers, shareholders and the consumers.

JETRADER: What do you see as the next big challenge to the global aviation industry?

WM: If you look at the global airline industry we realize it is a relatively young industry that is facing a major shift in demographics and in economic power that will create major changes in its structure. That is where I think the global regulatory framework can affect how we operate technically and operationally, including the security element, and where we will be in two to five years. It is necessary that we stretch the plate, not look at it from an American or European perspective but from a global perspective. Finally we need to address the perception of politicians and the public about how aviation really contributes to global prosperity, affects mobility and now more urgently how we impact the environment. These are the challenges we will face.

JETRADER: Thank you Mr. Mayrhuber for your time.





ISTAT Foundation 2007 Scholarship Winners



It's my pleasure and honor to write to you as the new Chairman of the ISTAT Foundation Board of Trustees.

I approach this appointment in the hope that I can continue the good work that has gone before me and that I can help along with my Board colleagues to

capture the enthusiasm and support for the Foundation that we all experienced during the Phoenix conference and convert this into meaningful commitments to benefit others both within and outside the aviation community.

Elsewhere in this issue of *Jetrader* you will find some images of the conference and some of the scholarship recipients and whilst not wishing to be repetitive I would just like to add my thanks to all of those participants who made the Foundation aspect of the Phoenix conference so successful and inspirational including, The Scholarship recipient representatives, Roundtable Members, The Batchelor Foundation, Steven Udvar-Hazy to name just a few. We continually review the Scholarship programme and I have been interested to hear some observations of ISTAT members in respect of broadening the scope and range of future scholarships and we will be considering this further. The Embry Riddle disaster relief effort was something that was spotlighted in Phoenix and I am pleased to say has continued to receive support from the membership post Phoenix and you will also be receiving a further message related to this programme in the near term.

As not only the new chairman but also a new member of the Foundation Board of Trustees I intend to spend the first few months of my Chairmanship listening to my fellow Trustees and hearing the background of how we arrived at where we are today and also getting up to speed on the various initiatives that are in the works already. I am also available to the whole membership to receive any thoughts and suggestions that you may have and wish the Foundation to consider. However please don't think that this means you have a few months of reprieve where I will not be knocking on your door and looking for contributions and support as that will not be the case (don't screen my number when you see it on your caller ID – it could be a deal or a solicitation for support!!!!).

It would be remiss of me to not thank Bob Brown for his tremendous commitment and dedication to the Foundation during his tenure as Chairman even though the fruits of his and the Trustee's labors were self evident in Phoenix I would like to thank Bob on behalf of the ISTAT membership for his tireless efforts over the last two years. I am fortunate to have Bob remain on the Board of Trustees to help guide me through my term and look forward to working with him and my colleagues on the Board. Finally I would like to congratulate Mike Platt on his appointment as President of ISTAT and I also look forward to working with Mike to extend the relationship between ISTAT and the Foundation and to look at ways in which we can increase the cooperation that already exists.

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Pictured with **Mauricio Botelho**, Embraer and **Steven Udvar-Hazy**, ILFC **Elizabeth Halsmer**, pictured lower right, 2006 recipient of a type-rating scholarship from Aero-Services addressed the assemblage on the final evening at the President's Gala dinner



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GREENWICH • SAN FRANCISCO

The 7 Year Itch

In my previous article for this publication I noted that, post 9/11, the aviation market experienced a period of sustained change. Unlike what used to be known in the aviation insurance market as the 'Seven Year Cycle', rates rose dramatically and were slow to fall – partly due to the consolidation of capacity into fewer insurers and partly due to the nature of new capacity entering the market. The new breed of professional 'capacity providers' such as Berkshire Hathaway made it clear that they expected a greater return on their investment than the traditional markets had experienced and also made it clear that their capacity could be withdrawn if their objectives were not met. The result was a much more gradual return to lower rating levels that would have been the case in the past.

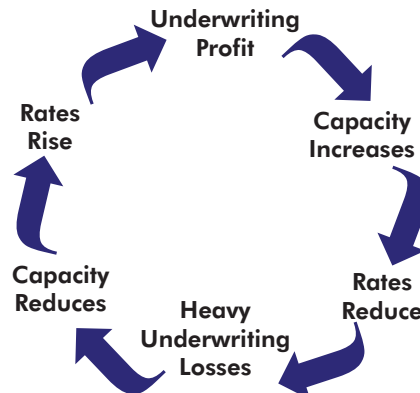
The final quarter of 2006 saw the first really dramatic reductions being obtained by brokers, with double-digit drops being the norm. This is a trend that, barring a severe downturn in loss experience, we expect to continue – at least until the final quarter of this year when the generally accepted October to September 'renewal year' has run its course.

To the outsider, the vagaries of aviation rating levels can be hard to comprehend – after all, most homeowners are used to fairly predictable insurance costs, with inflation gradually pushing up premiums to compensate for rising claims and litigation costs, and competition for market share generally gives the insurance buyer multiple options. The majority of insurance classes have a very wide premium base compared to the size of individual claims – but not aviation.

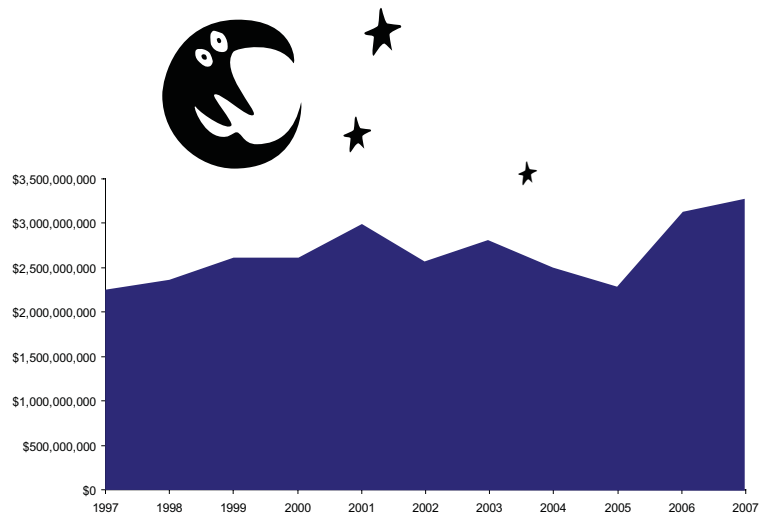
Despite constant improvements in air safety and ever-increasing sophistication in risk modelling, the bare fact remains that the loss of several old jets in developing countries will hardly raise a blip on insurer's screens; however, the loss of one modern wide-bodied jet full of American or Japanese citizens can easily erase the best part of half a year's total worldwide airline insurance premium – and even the very best of operators can "have a bad day".

The aviation insurance market has always been capacity-driven. Abundant available capacity gives brokers the option to drive premiums down as capacity competes for share. As rates fall, losses begin

to get ahead of premium and some insurers start to withdraw from the class. A shortage of capacity inevitably acts to drive up rates once again.



The chart below shows how worldwide aviation insurance market capacity for a typical major non-US airline has developed over recent years. The apparent increase in capacity over the years needs to be viewed against the higher hull and liability limits now required and the need for brokers to complete the placings at the most competitive terms.



The seven year cycle may be history, but it will be very interesting to see how deep the next nadir is and how long the subsequent recovery takes.



Peter Barleycorn is a senior aviation insurance market analyst at Jardine Lloyd Thompson. JLT is a leading risk management adviser and insurance and reinsurance broker with a major global specialty in the field of aviation insurance. Peter.Barleycorn@JLTRE.COM
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Conference Panel Financing New Aircraft Needs

Moderator : **Gary Laderman**, SVP, Corporate Finance & Treasurer, Continental Airlines Inc.

Panelists : **Walt Skowronski**, President, Boeing Capital Corporation; **Birgitt Garitz**, Managing Director, Global Head of Aviation, WestLB AG; **Robert Gates**, Director, Merrill Lynch; **Mark Streeter**, Vice President, JP Morgan Securities; **John Slattery**, Managing Director, Head of Aviation Capital – The Americas RBS Greenwich Capital



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Let's talk airplanes! And that's what happened through numerous educational sessions, exhibits and networking. Speakers included Scott Carson of Boeing, Frederico Curado of Embraer, Gerry Laderman of Continental Airlines, John Leahy of Airbus, Wolfgang Mayrhuber of Deutsche Lufthansa, Trung Ngo of Bombardier, Doug Parker of US Airways, Walt Skowronski of Boeing Capital and Steven Udvar-Hazy of ILFC. Our panelists discussed relevant topics on financing aircraft needs, aircraft valuation and operating lessors. The annual golf tournament raised funds for the ISTAT Foundation which provides scholarships, educational programs and grants to promote the advancement of commercial aviation and humanitarianism. Plan to attend our 14th European Conference in Vienna, 30 September to 2 October 2007.



24th ISTAT Annual Conference

Phoenix
March 2007







Conference Panel Aircraft Valuation

Moderator : **Doug Runte**, RBS Greenwich Capital Markets;
Panelists : **Fred Klein**, President, Aviation Specialists Group; **Phil Seymour**, Managing Director, IBA; **Pete Seidlitz**, President, Bristol Associates; **Doug Kelly**, Vice President, AVITAS; **Clive Medland**, SVP Simat, Helliesen & Eichner, Inc; **Robert Agnew**, President & CEO, Morten, Beyer & Agnew



Conference Panel Operating Lessors' Panel

Moderator : **Perry Flint**, Editor, Air Transport World;
Panelists : **Steven Udvar-Hazy**, Chairman & CEO, ILFC; **Klaus Heinemann**, CEO AerCap; **R. Stephen Hannahs**, Managing Director, & Chief Executive, Aviation Capital Group; **Franklin Pray**, President & CEO, AWAS



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Bombardier CRJ-900 Appraisal . John Keitz, President

BK Associates, Inc . tele +1 516 365-6272 . email john.keitz@bkassociates.com

Background :: The Bombardier Regional Jet Series 700 is a stretched, 70-seat variant of the 50-seat Bombardier Regional Jet Series 100 and 200 aircraft and entered service in 2001. It is powered by two General Electric CF34-8C1 engines.

A still further stretch to 90 seats, the CRJ-900 entered service in 2003. It has the same fuselage cross-section as the -700 but is 12-feet longer and allows for four additional rows of seating. Three versions are available. The CRJ-900 Standard, the -900ER (extended range) and -900LR (long range).

The CRJ-705 (so far, operated only by Jazz Air) is based on the CRJ-900 platform, however, has a separate Type Certificate from the CRJ-900 and is limited to 75 seats to satisfy the pilot scope clause. Both models are powered by two General Electric CF34 8C5 engines.

Basic Specs ::

Wing Span — 81.5 Ft.

Length — 119.3 Ft.

Maximum Takeoff Weight — 84,500 Pounds

Maximum Landing Weight — 73,500 Pounds

Maximum Zero Fuel Weight — 70,000 Pounds

Operating Weight Empty — 47,800 Pounds

Fuel Capacity — 2,945 U.S. Gallons

Range With 86 Passengers — CRJ-900 — 1,596 n.mi.

CRJ-900ER — 1,840 n.mi.

CRJ-900LR — 1,976 n.mi.

Passenger Configuration — 86 Seats - All Economy (-900)

74 Seats — 2 Classes (-705)

Current and Future Market Outlook :: As the regional airlines out-grow their 50-seat or less aircraft, there is no doubt that the demand for 70 to 100-seaters will continue to improve. The consensus of forecasts is for demand for some 4,000 or so aircraft in this size category over the next 20 years. So far, neither the CRJ nor its competitors from Embraer have dominated the market and the recent announcement that Bombardier will introduce the larger CRJ-1000 will further encroach on the CRJ-900's market share, although there are still reports of an expected large order from another U.S. airline.

When one considers the factors that usually indicate market success and retention of value such as performance characteristics, fleet size and operator base, there are pluses and minuses for both the CRJ-900 and ERJ 190 families.

There are 351 ERJ aircraft in service or on order with 14 operators indicating an impressive operator base for an aircraft that was only introduced in 2005. However, two U.S. operators dominate the fleet with 195 aircraft between them.

The ERJ 190 family is slightly larger, by a few seats, and has longer ranges — 1,700 to 2,200 n.mi., depending on the variant. Based on the sources we have, the purchase price for a new CRJ-900 is about \$1 million less than the ERJ 190 and, according to U.S. DOT data (from U.S. airlines only), the direct operating cost — crew, fuel and maintenance — is \$16.22 per seat/block hour for the CRJ-900 versus \$18.01 for the ERJ 190.

One must conclude that the CRJ-900 has been modestly successful and a little more market penetration in Asia would make its day.

Current Fleet + Backlog by Region as of March 2007

			Region			No. of Operators	Total Fleet	Firm Orders	Announced Options	Stored	Total	Percentage
			Africa/Middle East			14	37	1	0	0	9	4
			Asia/Pacific			20	113	0	0	0	0	0
			Europe			28	118	27	0	0	65	30
			Latin America/Caribbean			13	33	0	0	0	0	0
			North America			7	207					
			Private/Gov't/Military/Mfg			0	5	—	—	—	—	
			Unannounced			0	0					
			Total			82	513					
Yr. Of	CMV	Base Value in \$ Millions (2.5% inflation)										
Mfgr.	2007	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
2003	18.00	19.70	18.70	17.45	16.55	15.30	14.55	13.65	13.15	12.60	12.25	12.05
2004	19.70	21.55	20.60	19.30	18.15	16.80	15.95	14.95	14.40	13.80	13.45	13.10
2005	21.40	23.35	22.55	21.10	19.85	18.30	17.30	16.25	15.65	15.05	14.60	14.10
2006	23.10	25.20	24.50	22.90	21.50	19.80	18.75	17.60	17.00	16.30	15.75	15.15
2007	24.75	27.00	26.40	24.70	23.20	21.30	20.15	18.95	18.25	17.55	16.90	16.15

The aircraft values stated herein are work product of independent third parties sources, and ISTAT neither approves or indorses the information contained herein or the use thereof for any purpose whatsoever.

Boeing 767-300ER Appraisal . John McNicol, President,

Aircraft Information Services, Inc. telephone +1 419 582 8888
email jmcnicol@aisi.aero

Background :: The B767-300ER is a twin engine, widebody, stage 3, two man crew aircraft sized between Boeing's B757 and B777. Rollout and first flight were late in 1986 with certification in January 1988. First delivery was February 1988 to American Airlines. The B767-300ER is powered by three engine types, GE CF6-80 engines, PW 4000 engines and RR RB211 engines.

Basic specs ::

Wing Span — 156 ft 1 in

Length — 180 ft 3 in

Maximum Takeoff Weight — 380,000 to 412,000 lbs

Maximum Landing Weight — 300,000 to 320,000 lbs.

Maximum Zero Fuel Weight — 278,000 to 295,000 lbs.

Operating Weight Empty — 193,800 to 198,400 lbs.

Fuel Capacity — 23,980 U.S. Gallons

Range with 218 Passengers — 6,105 nm

Passenger Configuration — 218 Seats — 3-class

269 Seats — 2-class

Up to 351 Seats — 1-class

Average Fleet Age — 11.9 years

As of March 2007: Current Fleet + Backlog by Region

Region	No. of Operators	Total Fleet	%	Orders	Stored
Africa/Middle East	14	37	7.2%	0	2
Asia/Pacific	20	113	22.0%	10	1
Europe	28	118	23.0%	0	2
Latin America/Caribbean	13	33	6.4%	8	3
North America	7	207	40.4%	0	6
Private/Gov't/Military/Mfg	0	5	1.0%	0	0
Unannounced	0	0	0.0%	4	0
Total	82	513	100%	22	14

Current Fleet + Backlog by Engine

Engine	Total Fleet	%	Orders	Stored
General Electric	299	58.3	18	10
Pratt Whitney	183	35.7	1	4
Rolls Royce	31	6.0	0	0
Undecided	0	0.0	3	3
Total	513	100 %	22	14

Current and Future Market Outlook:

The closest direct competitor to the B767-300ER in capacity is the A300-600R, although its 4150 nm range is clearly inferior. The newer A330-200 with 12% more capacity, has surpassed the B767-300ER in range and maximum cruise speed, and the Cross Crew Qualification or CCQ benefits of the A320/A330/A340 family has resulted in the newer design Airbus widebodies overtaking the older B767 design in the marketplace. The new A350XWB in development would theoretically compete with the B767 300ER/400ER, however its larger size and 2015 delivery date make the point moot. The new, all composite B787 which is intended to supplant the B757, B767 and possibly the smallest B777 will start deliveries in 2008 and with 15% to 20% improvement in operating costs has the potential to obsolete similar sized existing aircraft

Production of the B767 will probably cease in 2008 unless the often deferred Boeing proposal to the U.S. Air Force for some 100 KC767A (B767-200ER derivative) tanker aircraft is accepted. There is an active cargo conversion program for the B767-200/200ER with 26 conversions and an unknown number of orders, and now an active B767-300F conversion program. This is perhaps not surprising as in our opinion the B767-300ER is a better candidate for conversion, having considerably larger capacity for little extra conversion cost.

Appraisal Values: Aircraft: B767-300ER, CF6-80C2B6, 400,000 lb

Yr of Mfgr	HLCMV	HLBV M US\$	HLFV	HLFV	HLFV	HLFV	HLFV	HLFV	HLFV	HLFV	HLFV	HLFV
2007	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	
1988	23.82	23.58	21.54	19.8	18.22	16.76	15.41	15.20	13.09	12.06	11.10	10.24
1990	26.95	26.68	22.37	22.41	20.61	18.95	17.44	16.06	14.80	13.65	12.56	11.59
1992	30.07	29.77	27.19	25.01	22.99	21.15	19.45	17.93	16.52	15.22	14.03	12.93
1994	33.19	32.86	30.01	27.60	25.38	23.35	21.48	19.79	18.23	16.80	15.49	14.26
1996	37.10	36.73	33.55	30.85	28.38	26.09	24.00	22.12	20.39	18.79	17.31	15.95
1998	41.62	41.21	37.63	34.61	31.83	29.27	26.93	24.82	22.87	21.08	19.42	17.90
2000	46.73	46.73	42.36	39.03	35.97	33.15	30.54	28.14	25.93	23.89	22.02	20.29
2002	52.79	53.87	48.06	44.47	41.15	38.07	35.20	32.44	29.90	27.55	25.38	23.39
2004	61.16	63.71	55.95	51.99	48.30	44.87	41.63	38.36	35.35	32.58	30.01	27.66
2006	70.24	76.77	64.98	60.95	57.17	53.63	50.17	46.23	42.60	39.26	36.17	33.33
2007	74.64	84.57	68.73	64.04	59.75	55.75	52.01	48.53	45.29	42.25	39.43	36.71

HLCMV (Half Life Current Market Value) HLBV (Half Life Base Value) HLFV (Half Life Future Value)

Future values transition from current market values today to a balanced market 5 years out. Future values assume 2.5% annual inflation from today to future dates. Values are average, single aircraft, half life values.

* Note: 2007 aircraft's CMV and BV are half life for comparison. New Aircraft values would be \$8.8 million US dollars higher today.

The aircraft values stated herein are work product of independent third parties sources, and ISTAT neither approves or indorses the information contained herein or the use thereof for any purpose whatsoever.



Keri Wiznerowicz

"...as students grew in their educational experience, the industry employees themselves showed corresponding educational growth, with each gaining confidence by providing input into the creation of new knowledge for product improvement"

Education model instills real-world readiness into graduates

By Denver Lopp and David Stanley, Purdue University Department of Aviation Technology

Students who demonstrate the discipline to succeed in college through hard work and strong study habits often expect a somewhat similar response in industry, only to be highly disappointed when these same approaches in industry do not result in similar success with career advancement. Soon after their arrival in the business world, these new graduates begin to realize that the system they developed in college for success has little relationship to the soft skills and transfer of technical knowledge demanded in a profit-oriented organization. Proficiency in project management, process analysis, applied research techniques, pragmatic measurements and especially business politics can become very difficult in attempting to transfer their "A" successes in controlled classroom settings to the actual industry environment.

As presented at the 2003 AMERC Conference, the data strongly support the fact that in the technical fields, including aviation, companies continually hire on technical skills, and "fire" because of a lack of soft skills. Purdue's Department of Aviation Technology in the last 10 years has experimented with closing this gap between academic learning knowledge and applied application in real work settings through a structure of tiered courses that combine a centralized theme of learning, research and industry engagement. We call it "engagement education."

Engagement education was built around a curriculum that incorporates real-world opportunities from industry into classroom learning, thereby countering students' expectations from academia to industry and smoothing their transition from "student" to "employee." While developing a new curriculum approach, aviation technology faculty members sought input from academic and industry leaders, and, on request from United Airlines, conducted an intensive needs-assessment study that identified four key skill sets for effective aviation management: leadership, communication, project management, and people skills. This study was based on extensive interviews at all levels of the aviation industry, from upper management to front-line workers, covering various stations across the United States.

A key component of this non-traditional educational process is focused on the motivation of students to concentrate on a focused deliverable, one that allows them to apply "book" knowledge to a real working environment. This educational foundation, which was found to energize learning in students, was established by formulating partnerships with companies, who embraced the team concept of students and employees working in their live environment to research and provide solutions for everyday problems. This educational model is mutually beneficial. For industry, a major objective for involvement is increased productivity and improved safety projects; for the students, the educational model maintains a scholarly environment where the essentials of higher knowledge are experienced, along with real-world applications. In addition, the educational process creates a sense of dual achievement for the industry partners, providing productivity and safety gains, as well as an educational benefit for industry employees.

The educational engagement structure The curriculum is structured with freshmen and sophomores enrolling in 200-level research courses, juniors and seniors in 400-level courses, and graduate students positioned as the assigned leaders through a designated 500-level research practicum course. In order to provide a creative culture in developing a nontraditional education program, a governing board of three faculty members provides relief for the mentoring faculty and student leaders in financial and institutional issues that may surface with industry partners or in complying with the university's regulatory requirements.

An oversight committee comprised of selected faculty members and graduate students enrolled as project leaders provides direction in creating learning objectives, guidance in researching processes, initiating networking connections with industry partners, support in obtaining budgeted resources and, in particular, helping to establish a positive and non-threatening learning culture for the education system. A

PURDUE Continued page 20



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<The Board of Directors would like to congratulate **Israel Padron** on his new affiliation with CIT Aerospace and thank him for his years of service as a valuable member of the ISTAT Board. The ISTAT By Laws provide that no two Board members may be from the same company. Since Tony Diaz of CIT Aerospace is an existing Board member, Israel has offered his resignation one year before his term would otherwise end so that Tony may serve the remaining two years of his three year term. In accordance with our Bylaw provisions for filling a Board vacancy, the Board has nominated and elected **Marc Allinson**, Vice President - Financial Services of Rolls-Royce who was the first runner up in the voting at the 24th Annual Conference and his term will run for the one year remaining in Israel's term.

PURDUE Continued

graduate research assistant in a staff function role assists in monitoring and scheduling the participants of the educational projects. A single faculty member or a team of faculty members is also assigned for each project. A team of 200-level and 400-level students are then assigned to an industry project, with the 500-level graduate students accepting the overall responsibility for organizing, formulating and executing the objectives of the educational undertaking for each individual project, as determined by the instructors and industry partner. Student leaders at a 400-level course are assigned direct responsibility of each team and report to the particular 500-level project leaders and corresponding faculty member.

The team members assigned to a specific project meet on a weekly basis, as needed, to prepare and accomplish the project objectives as decided between the industry partner and the research team. In addition, the graduate students enrolled in the 500-level graduate courses and leading a project are required to meet weekly in an hour-and-a-half discussion session with other team leaders and mentoring instructors. Each week, topics, as outlined in the course schedule, are discussed and related to the experiences that the graduate leaders are undergoing in their own team groups. Reading material and exploration of similar case studies are conducted in a free and open discussion, focusing on practical solutions that each group could consider for their own project involvement. A similar structure is scheduled and conducted separately for the same amount of time with 400-level team leaders. These two groups meet separately, which leads to candid discussions among group leaders, team leaders and faculty on major issues. Although these scheduled sessions focused on assigned reading material and on current mentoring issues that the leaders are experiencing, the character of the meetings is best expressed by one faculty member who commented that "the sessions symbolize weekly staff meetings that commonly occur in industry." In addition, biweekly educational sessions are scheduled for all student team members.

Projects are chosen at first by faculty, who explore key issues with a chosen company that had shown an interest in a research proj-

Brief CV Klaus W. Heinemann CEO AerCap



Mr. Heinemann has been the Chief Executive Officer of our company since April 2003 and has over 25 years of experience in the aviation financing industry. Mr. Heinemann has been a director of our company since 2002. Mr. Heinemann joined our company in October 2002 from DVB Bank, where he was a Member of the Executive Board. In 1988 he joined the Long-Term Credit Bank of Japan in London as Deputy General Manager and Head of the Aviation Group. He was later appointed as Joint General Manager of the Head Office at the Long-Term Credit Bank of Japan, where he was responsible for the Transportation Finance division

before this division was sold to DVB Bank in 1998. Mr. Heinemann started his career with Bank of America in 1976, where he helped to build up its Aviation Finance department in Europe. Mr. Heinemann holds the degree of Diplom-Kaufmann (Bachelor of Commerce) from the University of Hamburg. Mr. Heinemann is a Trustee of the ISTAT Foundation.

ect. Arrangements and discussions of the educational research projects are conducted among faculty, potential student project leaders and the industry representatives in establishing the objectives of the project and the resources to be provided by the industry partner and Purdue's Department of Aviation Technology. This proposal then is discussed with the oversight committee. As the engagement program has gained maturity and success in its relationship with several industry partners, requests for project subject areas have migrated to being initiated by the industry players themselves, going from a solicited situation to demand-driven for the education program. The oversight committee is an important agency in screening and forwarding selected education projects based on faculty and student expertise and interest.

The qualitative benefits of engagement education The Department of Aviation Technology has entered all industry partnership arrangements with a clear understanding that education is the foremost goal of any selected joint project. Industry partners, which have included United Airlines, IBM, Jet Blue, TIMCO and Northwest, have responded with positive support in helping to build the structure of each project, using a team concept of interaction among students, faculty and various organizational levels of employees. As projects have progressed, it has become apparent that all participants gain something from the experience, including increased applied research techniques, new technical processes and formulations for the soft skills of management, leadership and interaction with people.

It was discovered that as students interacted with the industry employees, the employees would take on very interactive "dumping" of information that consultants or faculty members were not normally involved in. This interaction between students and employees created an active education for obtaining practical knowledge needed for success in the business world. It was observed that as students grew in their educational experience, the industry employees themselves showed corresponding educational growth, with each gaining confidence by providing input into the creation of new knowledge for product improvement.



FLIGHT 509-302

Flying in the Queen of the Sky . Part Two

Arriving at the ramp after our close call with an undershoot, we shut down the engines and like the other airlines sitting there, decided to wait until daylight when the snow was forecasted to ease up. Like the passengers from the other airlines stuck there, ours were put up in the musty WW11 Quonset huts built for the crews ferrying bombers to England in the 1940s. Fourteen hours later the snow finally stopped and the snow ploughs, de-icing and fuel trucks were everywhere as PAA, TWA and every major European airline got its aircraft ready for the six hour daylight flight to JFK, (then Idlewild).

With the cabin cleaned and the beds converted back to seats, the passengers were served an extended breakfast on linen with silver flatware and coffee set. In the cockpit we took turns to hastily eat the same food without the silverware, (don't they trust us? was the usual remark).

Descending towards Idlewild, a line of heavy thunderstorms covered the area and every one of the aircraft that had departed Goose Bay now ended up in the holding patterns getting tossed around, (remember none of us had radar). We were in the middle of the stack of circling aircraft when there was a sharp crack followed by two more and a strong smell of ozone in the cabin – lightning strikes. ATC is bringing us down 1,000 feet at a time and the controller called for Speedbird 302 to descend to the next level; upon his third repeat of the call we realized we were not transmitting, he then told us to turn ninety degrees so that their radar could identify us, which it does, (no transponders either). At this point ATC cleared all of the aircraft circling below us to a different holding pattern, then called to say if we could hear him, to descend and execute a GCA approach; someone remarked that he hoped the Air France Connie crew below us understood English better than he did french. After landing, with the fire trucks lined up near the runway we checked the fuselage; there was a line of strike marks along by the VHF aerials and most of the aileron discharge wicks had gone. The cabin was a mess; for many of the passengers, the extended breakfast had done a 180 degree turn into barf bags.

Postscript By the end of 1955 most transatlantic commercial aircraft had been fitted with HF radios and the radio officers retired; the specialized navigators stayed on until the jets came into service with their Doppler navigation system, which in its turn was replaced by inertial navigation computers. About the time I was transferred to the Britannia proving flight program at Hurn in April, 1956, the Sperry analyzer was installed at the Stratocruiser's FEO station; it was a small cathode ray device which the engineer used to check each engine's 56 spark plugs and four dual magnetos, as well as for detonation and valve train irregularities. Pan Am also fitted the airborne radar unit that the air force had on the KC-97 in-flight refueling version of the Stratocruiser; BOAC didn't bother; the Britannia-300 and Comet 4 were scheduled to replace the Stratocruiser and the interim DC-7C -which had radar.

Fifty six Stratocruisers were built, ten were destroyed and a number badly damaged; it was considered to have a poor safety record, due mainly to it rubber core filled hollow steel blades. There were a number of runaway props and blade failures which separated from the engine. The first was Pan Am N1039V on April 29, 1952, which crashed in an uninhabited part of the Amazon jungle 523 miles south of Belem, Brazil; the wreckage was spread over a square mile, with number two engine, port outer wing section, elevators and rudder scattered widely from the fuselage which had the starboard wing still attached. My boss, Ralph Dobbins, when in November 1957 I joined Pan Am, had been a member of the search team. Inspections of in-service propellers revealed a number of blades had longitudinal cracks in the hollow shell of the blade; the rubber core would separate from the shell causing a vibratory unbalance. There were more such failures to come. Pan Am had two over the Pacific; one made a successful ditching by a Coast Guard cutter; the photograph was widely published around the world, and the other made it to a runway on a small atoll.

The BOAC incident occurred around 30 degrees west –the mid-point over the Atlantic- the flight engineer recounts how there was a sudden drop in oil pressure to zero, and a rapid loss of oil quantity. He immediately feathered the propeller, (there is a small reservoir of oil in the event the main engine supply to the

London, Heathrow,
October 30, 1954:
BOAC Boeing B377
Stratocruiser G-ACGK
was being prepared for
flight when we checked
into the operations
office to meet the five
other flight crew mem-
bers; two pilots, the
senior flight engineer,
navigator and the radio
operator who would
use his morse key to
communicate with the
three weather ships
stationed across the
Atlantic. Back then we
had no HF radio, tran-
sponder or radar; the
navigator would use
Loran C from stations
in Iceland, Greenland
and eastern Canada,
and a sextant if the
stars were visible.

TOTAL AIRBORNE TIME
18 HRS 14 MINS

ELAPSED TIME
51 HRS FROM
CHECK IN AT
LHR OPERATIONS

propeller is lost), and it almost stopped turning, but then started to speed up into over-speed. He went on how the vibration shook the instrument panels so violently they were just a blur, and the scream of the propeller so loud they could not shout above it; there was a jolt so violent he thought the plane was coming apart; the propeller and the nose section of the engine with its reduction gears tore loose and passed over the wing, missing the horizontal stabilizer. Eventually, both Pan Am and BOAC replaced the hollow steel blades with the new solid Duralumin propellers. BOAC did the same on the Britannia turbo-prop aircraft shortly afterwards.

Northwest ditched one of its Stratocruisers, N74608, in Puget Sound shortly after take off from Seattle-Tacoma on April 2, 1956, when upon retracting the flaps there was severe buffet and deteriorating controllability. Five passengers died from exposure in the icy water. Flight tests showed that with the cowl flaps wide open in the taxi position, the aircraft would fly normally until the flaps were retracted; buffeting and control difficulties would then make continued flight problematic. It was concluded that the flight engineer had failed to close the engine cowl flaps before take off. We all got warning notices from the BOAC Stratocruiser fleet chief flight engineer.

A Northwest close call was at Midway, Chicago. BOAC had just started service there and our ground crew chief saw the whole thing. He told me how the Stratocruiser landed on a wet runway but there was no sound of engines being reversed; the aircraft went off the end and ploughed through the chain-link fence around the field, picking up a length of fencing with a propeller and whirling it around like a lasso. The aircraft finally stopped on the road outside without hitting any cars or houses. The four reverse control circuit breakers had been pulled, probably during overnight maintenance, and not pushed back in.

Airlines which lost one airplane: BOAC; NWA; UAL. Pan Am lost 7 of its fleet of 29 Stratocruisers.

On one occasion we had the prime minister of Jamaica and his entourage on board for a flight from Montego Bay. On the approach into Kennedy the flaps would not extend, but not to worry, Boeing thinks of these things and how to handle them. In this case I went down stairs into the lounge where the PM crowd was obviously feeling no pain judging by the number of empty rum bottles. I had to lift up the three mirrors at the front end but the PM was sprawled out on the banquet in front of them; a gentle shake of his shoulder, no response, a more vigorous shake, still no response. I beckoned over the barman and told him to grab the other shoulder; we heaved him up and deposited him on one of the side banquets. All were still quiet; I lifted up the mirrors and exposed the rear spar with all of the wiring, plumbing, valves and the three electric motors; one for the landing gear, one for the flaps and a spare. Sobriety returned in a flash, but never a word. With the quick release screws and cannon plugs it was only two or three minutes to complete the change; Boeing had thoughtfully provided a phone by the motors to call the cockpit; the motor whined, the flap drive shaft whirled and I closed the mirrors and left. Still not a word from my audience; thinking back, I should have passed around my hat.

The B377 electrically powered landing gear extended and locked down in some 2.5 seconds; it retracted in about 4.6 seconds. I never read any figures for the flaps.

The FAA has recently rescinded the 180 minutes ETOPS limitation for twin-engine aircraft, provided the failure rate does not exceed one per 100,000 hours. On the Stratocruiser, our shut-down rate averaged one every 236 hours. From my log book it seems that on many other flights we had to nurse a misbehaving engine and aircraft systems.

References: My log book and BOAC employees involved in some of the incidents; Speciality Press: Airline Tech Series, Volume 9, Boeing 377 Stratocruiser; Nicholas A. Veronico; Multiple Web sites to check dates and aircraft performance; Boeing and BA Historical Archives photographs

Australia remains unique among the world's aviation markets, remote from Asia's main flight paths, making bilateral air travel agreements difficult to negotiate.

What's more, Australia is fiercely protective of its own international airlines and last year denied Singapore Airlines trans-Pacific flights to the United States. Nonetheless, the market is innovative, with low-cost carrier JetStar International now flying to resort destinations in Asia as well as Hawaii. As for flag carrier Qantas, it is a symbol of the revival of interest in airline stocks: a consortium recently made a US\$8.6 billion bid for the airline, which could end up being Australia's largest takeover.

Despite all the regional differences in Asia Pacific, the one common challenge facing aviation throughout the region is globalization. The airlines of the region can no longer be viewed as purely domestic companies; expanding international route networks means they can be stakeholders in dozens of countries.

Globalization as well as the myriad other opportunities and challenges facing the sector mean strong leadership is more important than ever at Asia's carriers.

Aviation leadership should be effective not only in the narrow area of developing a profitable airline business, but also in communicating the key role aviation will play in the future. This leadership needs to appeal to a whole range of stakeholders: the public, the region's governments (many of which are skeptical about liberalization), and employees — for all aviation's economic importance,

Asia's young see careers in other sectors as holding more promise. What's more, the world's surging private equity business will grow increasingly interested in the region's aviation sector. This will have huge implications for aviation leadership given that private equity firms focus firmly on the bottom line — and are often willing to make profound changes in the boardroom.

The problems at Suvarnabhumi Airport will one day be resolved, just as they were at Hong Kong's Chek Lap Kok and at Kuala Lumpur's International Airport in the late nineties. Likewise, the challenges facing Asia's aviation sector will be overcome in good time. Creative and strong leadership at Asia's airlines will be essential in assuring that these obstacles are overcome sooner rather than later.

“Globalization as well as the myriad other opportunities and challenges facing the sector mean strong leadership is more important than ever at Asia's carriers.”

Torbjörn Karlsson leads the Aviation, Aerospace & Defence Practice in Asia Pacific. He is also involved in the transportation and supply chain sectors. Prior to joining Heidrick & Struggles, Torbjörn was vice president, commercial, Asia Pacific for Honeywell Aerospace.

He is based in Heidrick & Struggles' Singapore office and can be reached at tkarlsson@heidrick.com or +65 6332 5001 www.heidrick.com

Learning new material and management techniques became a central drive, with students and employees understanding that new and innovative processes were needed for improvement. Joint project meetings were held at industry settings, allowing Purdue students to travel to various cities and be exposed to live laboratory environments for research and educational development. In addition, working sessions with industry employees were conducted at Purdue with employees interfacing directly and in-depth with Purdue students and faculty.

Students were tasked with preparing agendas and setting up sponsored educational sessions for industry employees. This allowed industry employees to attend several short educational sessions on various technical and managerial topics. The industry employees also were routinely solicited to guest-speak to discuss their industry experiences in scheduled class visits, giving students insight into the culture of the workplace. This had the added benefit of motivating industry employees in their own development while at the same time helping to teach students. This synergistic relationship helped to improve motivation and creativity among all the parties involved — the project team of students, industry employees, and faculty.

The direct benefits of this relationship became quickly apparent. During the project — due to the interaction among faculty, students and industry — questions were raised, problems were addressed and solutions were discovered, none of which would have taken place, had this group never interacted. This somewhat nontraditional educational approach — in which freedom, ideas and interaction were encouraged — allowed this synergy to take place. It was in this environment that students were able to see clearly the connection between their academic book knowledge and how that knowledge applied to real life in their future careers.

Next month the final installment "The Quantitative Benefits of the Engagement Education", or the importance and benefits of an Public/Private Partnership Educational Model

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