

AIRBUS A380-800

2010

ASPIRE  
ANNUAL REPORT



# ASPIRE

## Asia and Pacific Initiative to Reduce Emissions

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**On February 18, 2008, a multi-lateral partnership known as the Asia and Pacific Initiative to Reduce Emissions (ASPIRE) was created in Singapore. The first air navigation service providers (ANSPs) to sign the ASPIRE joint statement were Airservices Australia, Airways New Zealand, and the Federal Aviation Administration.**

During this reporting period the ASPIRE group has expanded its ANSP membership to include

11 October 2009 - Civil Aviation Bureau, Japan (JCAB).

1 February 2010 – Civil Aviation Authority of Singapore (CAAS)

### Goals

The partners under ASPIRE are committed to work closely with airlines and other stakeholders in the region in order to:

- accelerate the development and implementation of operational procedures to reduce the environmental footprint for all phases of flight on an operation by operation basis, from gate to gate;
- facilitate world-wide interoperability of environmentally friendly procedures and standards;
- capitalize on existing technology and best practices;
- develop shared performance metrics to measure improvements in the environmental performance of the air transport system;
- provide a systematic approach to ensure appropriate mitigation actions with short, medium and long-term results; and
- communicate and publicize ASPIRE environmental initiatives, goals, progress and performance to the global aviation community, the press and the general public.



# MESSAGE From CEOs

Despite its global nature, the aviation sector is one of the most regulated industries in the world. Not only do Air Navigation Service Providers (ANSPs) have to contend with the competing commercial interests of the airlines themselves hit hard by the recent Global Financial Crises (GFC); initiating improvements to air travel emission reductions requires collaborating with governments and military organisations, as well as working within the limits of differing processes, rules and regulations.

ASPIRE, in its early days, proved that collaboration for a common cause is the best mechanism to support continual delivery of ASPIRE goals. The GFC and continued high cost of fuel hit airlines hard and whilst it was dire news for their operations, ASPIRE's potential to reduce fuel consumption became a unifying goal, providing a catalyst for gaining further airline interest and ultimately, their buy-in.

The ASPIRE partners have long been ardent supporters of developing and trialing new air navigation service technology and procedural enhancements in the oceanic environment. The maturity of the region's fleet and route structure and the demonstrated willingness of airlines,

industry, ANSPs and governments to work together continues to offer valuable opportunity to showcase the Asia and Pacific region's leadership in aviation emissions reductions to the rest of the world. Over the past year the ASPIRE program has focused on expanding its membership to progress its goals within the Asian and Pacific regions.

ASPIRE is our commitment to ensuring the very best environmental stewardship along these Asian and Pacific routes. We believe aggressive action to deliver regional concepts of operation and take advantage of innovations in aircraft and air traffic management technology are absolutely crucial if aviation is to become recognized as an environmentally-responsible industry.

This second ASPIRE Annual Report looks back at our progress over the past year and casts an eye towards some of the initiatives we have planned in the future. Our ultimate goal is that our work programme will inspire others in the industry and around the world to work with us and with each other to reduce the carbon footprint of the aviation sector.



**GREG RUSSELL**  
CEO Airservices Australia



**ASHLEY SMOUT**  
CEO Airways NZ



**HENRY P. KRAKOWSKI**  
Chief Operating Officer FAA-ATO

*"The success of ASPIRE has gone well beyond the regional boundaries of Asia and the Pacific and it is now held up as an example of collaboration that can have far-reaching environmental benefits throughout the world. ASPIRE has taken the concept of 'green' flight and made it truly global."*



**MASAHIRO MUROYA**  
DG of ATS Department,  
Japan Civil Aviation Bureau

*"ASPIRE is a challenging initiative by air traffic services providers to tackle the climate change - we need to facilitate the environmentally-friendly aviation as an indispensable transport mode for the global sustainable activities through ASPIRE"*



**MR YAP ONG HENG**  
DG of Civil Aviation Authority  
Singapore

*"ASPIRE has shown the way in better aircraft fuel performance and carbon emissions reductions that can be achieved through active collaboration, harnessing technologies and employing best practices in air traffic management. Working together on these, ANSPs, airlines and other stakeholders can make a difference in international aviation's contribution to addressing environmental protection."*

# INTRODUCTION to ASPIRE



## In the beginning...

The ASPIRE concept began as an exchange of ideas during the APEC Environmental Summit in Singapore in September 2007. Since then the program has matured and expanded. In 2009/2010 the ongoing collaborative approach to air traffic management within key Asian and Pacific routes was nurtured by Doug Scott (Airservices Australia) as chair, Kevin Chamness (FAA), Greg Houghton, (Airservices Australia) Mark Goodall (Airways New Zealand) and new entrants, Hideki Sugai (JCAB), Takahiro Morishima (JCAB) and Edmund Heng Cer Sian (CAAS).

### What's happening now...

The fact that ANSPs can have a big impact on helping airlines reduce their fuel burn and emissions was proven following the ASPIRE series of ASPIRE flights in 2008 and 2009. These flights were about testing the worlds best practice and gaining an understanding of what is required to provide repeatable 'normal' operations as close as possible to best practice.

"Now that the ASPIRE concept is matured and delivering value and environmental benefit, it was important to increase the sphere of influence with the inclusion of our Asian participant," says current chair, Doug Scott. "It's only through regional collaboration that we'll be able to generate the emission savings that the airlines need across various destinations. Expansion to Asian ANSPs is critical to our ongoing success as ASPIRE continues to be about Gate to Gate efficiency. It's a commitment by all participating ANSPs to collaborate with airlines and other stakeholders in order to meet best practice within the region."

### And in the future...

Rolling out 'Best practice' across the region requires effort, planning and investment by ANSPs and Airlines. ASPIRE aims to assist ANSPs to promote these often silent successes. Successes need to be substantiated with meaningful measures. The industry as a whole

is commencing definition of complex, detailed environmental metrics that will not be available for measurement for some years.

ASPIRE has commenced implementation of a simple approach to environmental measures – "ASPIRE Daily". The concept will define the available best practices on a city pair and apply a rating declaring the capability of that route. The rating system will also be reflective of improvements over time. The ASPIRE group sees "ASPIRE Daily" as an achievable real activity that stimulates and communicates improvement.

The success of the ASPIRE partnership is also defined by the ASPIRE Strategic Plan. This document lists a series of recommended procedures, practices and services that have been demonstrated or have shown the potential to provide efficiencies in fuel and emissions reduction management. These recommendations encompass all phases of flight from gate-to-gate, and are designed to reflect the unique nature of the Asia and Pacific region, where international flights often exceed 12 hours in duration.

Progress towards the stated goals of the ASPIRE partnership is reported on pages 12-13.

The Strategic Plan for 2010/2011 is currently being compiled and will include a supporting program from the planned entrance of AEROTHAI in 2011.

## Comment from the Chair (Doug Scott)

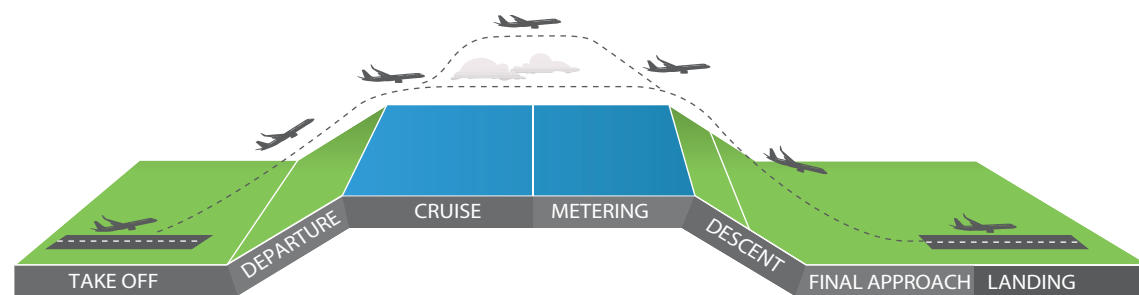


Studies into greenhouse gas emissions attribute 13% of the total emissions to the transport sector. Aviation is estimated to contribute around 2% to total emissions. Further analysis of the emissions attributed to transport, apportioned 74% to road, 13% to aviation and 13% to other modes.

The aviation sector is quite unique. Not only has it recognised the need for change but as a whole of industry through ICAO it has committed to a 2% annual reduction until the year 2050. Whilst technology will provide some of the answers - today's aircraft are 70% more efficient than those produced 40 years ago, ANSPs must continue to be proactive to ensure infrastructure, technology and ATM procedures complement this airborne capability.

ASPIRE is at the forefront, showcasing regional cooperation with initiatives which are efficient, predictable and repeatable.

Source - Aviation Seminar on Climate Change Jakarta Indonesia, 2 August 2010 - Jane Hupe Chief, Environment Branch International Civil Aviation Organization (ICAO)



# UPDATE ON

## entry of new ANSP & Airline partners

### Civil Aviation Bureau, Japan (JCAB)

A clear strategy of the ASPIRE group for this reporting period has been to expand the partnership into Asia. This commitment was met with the introduction of two new ANSP partners.

On 11 October 2009 the Japanese Civil Aviation Bureau (JCAB) was the first Asian ANSP to join the group.

The agreement was signed in Osaka by delegates of existing members FAA, Airservices, and Airways and Ryuhei Maeda, Director General of the Japanese Civil Aviation Bureau (JCAB).

The occasion was marked by an ASPIRE demonstration flight from Honolulu to Osaka undertaken by Japan Airlines (JAL).

"This is an important milestone in our collective effort to lessen aviation's environmental footprint," said FAA Administrator, Randy Babbitt. "We have all pledged to adopt and promote best practices that will benefit the environment."

ASPIRE Partners will recognize that JCAB has a long standing record of leadership in the Asia Pacific region and will expand the focus of the ASPIRE Partnership beyond the South Pacific, thus raising awareness of the environmental impact of aviation to a broader segment of the region.

"We look forward to the continuation of the global leadership and success of the expanded ASPIRE Partnership and the significant role that JCAB will play in the formulation of ASPIRE initiatives and strategic plans



JCAB signing on the 11th of October in Osaka, Japan – (L-R) Mr Perry Matthews, Acting Manager Industry Affairs, Int'l (Airways), Mr J. Randolph Babbitt, Administrator (FAA), Mr Ryuhei MAEDA, Director-General (JCAB), Mr Doug Scott, Acting GM ATC (Airservices)



CAAS signing – (L-R) Mr Greg Russell CEO (Airservices), Mr Ashley Smout CEO (Airways New Zealand), Mr Yap Ong Heng, Director-General (CAAS), Ms Dorothy Reimold Representative of the Administrator (FAA).

for the North Pacific, continuing the ASPIRE tradition of leadership and environmental stewardship" said DG of JCAB, Ryuhei MAEDA.

With JCAB's signing and expansion of ASPIRE beyond South Pacific area, All partners agreed to be recognized as the ASis Pacific Initiative to Reduce Emissions.

### Civil Aviation Authority of Singapore (CAAS)

On 1 February 2010 in the lead up to the Singapore Airshow, Mr Yap Ong Heng, Director-General, Civil Aviation Authority of Singapore (CAAS), signed the joint agreement with the existing ASPIRE partners, Mr Greg Russell CEO Airservices, Mr Ashley Smout CEO Airways New Zealand, Ms Dorothy Reimold Representative

of the Administrator FAA and Mr Masahiro Muroya Director-General JCAB.

Mr Yap Ong Heng said: "CAAS' participation in ASPIRE demonstrates its commitment to adopting best practices in air navigation to play its part in addressing aviation emissions and the environment. The ASPIRE spirit continues to burn bright. Pertinently so, as the air transport sector recovers from the global economic recession and moves on a growth path. The ASPIRE spirit continues to burn bright. Pertinently so, as the air transport sector recovers from the global economic recession and moves on a growth path. The sector is especially poised to grow strongly in the Asia-Pacific region. It was therefore with great foresight that



Airservices Australia, Airways New Zealand and the Federal Aviation Administration (FAA) of the United States of America had formed the ASPIRE Partnership. Aimed at promoting the aviation sector's environmental stewardship in the Asia and South Pacific region, the ASPIRE programme has attained one success after another since its inception. Significantly, the partnership was expanded to include the Civil Aviation Bureau of Japan (JCAB) in 2009, and the Civil Aviation Authority of Singapore (CAAS) in 2010.

In tandem with the joint agreement signing in Singapore, ASPIRE's first multi-sector demonstration green flight was conducted, involving a Singapore Airlines B747-400 flight from Los Angeles via Tokyo to Singapore. With the participation of the FAA, JCAB and CAAS, the flight flew an optimal route across the Pacific and down the South China Sea. Significant reductions in flight time, fuel consumption and carbon emissions were achieved. These, once again showed the operational and environmental benefits that could be attained through the adoption of environmentally-friendly procedures, technologies and best practices in air traffic management.

Indeed, given the transboundary nature of civil aviation, flights will only be able to fly optimal routes and altitudes across Flight Information Regions if Air Navigation Service Providers collaborate closely amongst themselves and with airlines and other stakeholders. ASPIRE recognises the need for such collaborative efforts to fully reap the benefits. The ASPIRE partners are therefore committed to work closely with other ANSPs, airlines and various stakeholders in the region to:

- accelerate the development and implementation of operational procedures to reduce the environmental footprint for all phases of a flight on an operation by operation basis, from gate to gate;
- facilitate interoperability of environmentally friendly procedures and standards;
- capitalize on technologies and best practices;
- develop shared performance metrics to measure improvements in the environmental performance of the air transport system;
- provide a systematic approach to ensure appropriate mitigation actions with short, medium and long-term results; and
- communicate and publicize ASPIRE environmental initiatives, goals, progress and performance to the global aviation community and the general public.

We would strongly urge others to join us in reducing the carbon footprint of the aviation sector.

At a later technical media briefing, CAAS released plans for the first multi sector ASPIRE flight SQ11, which operated from Los Angeles to Singapore via Tokyo.

CAAS is looking forward to doing its part for civil aviation. Said Ng Tee Chiou, Director (Air Traffic Services), CAAS: "CAAS has signed the ASPIRE joint agreement as a commitment of its environmental stewardship. As an Asia Pacific ANSP, CAAS is pleased to partake in the active collaborative effort with fellow ANSPs to reduce aviation carbon emissions and enhance operational improvements for greater efficiency, as well as better fuel savings for airlines."



**ASPIRE Partners , CAAS Media Briefing (L-R )** Greg Houghton (Airservices), Kevin Chamness (FAA), Captain Eric Pon of Singapore Airlines (who operated the ASPIRE flight from LA via Tokyo); Kuah Kong Beng and Edmund Heng Cher Sian, CAAS Air Traffic Services Division

# THE ASPIRE works program



This work program was initiated in June 2008 by the ASPIRE partners and has now expanded beyond the South Pacific to include the Asia Pacific region. The goals outlined in the 2009/10 plan include:

**ASPIRE flight demonstration program** – continue to conduct a series of demonstration flights, as required using concepts and technologies in flight efficiency and emissions reductions in all phases of flight. Two demonstration flights were completed within the Asia Pacific region. Please see details on pages 14-15

**Dynamic Airborne Reroute Program (DARP) Enhancement** – identify limitations and constraints to the existing Pacific DARP and expand focus into Asian region where possible, remove constraints via procedural, cultural and automation change.

- DARP is available for all FANS 1/A flights in FAA/South Pacific airspace.
- A program is also currently in place in Australian airspace to enhance the ATM system to fully automate the DARP processing. Delivery of the final optimized DARP automation will be aligned to their User Preferred Routes Program.
- For NZ airspace, DARP is available to all FANS 1/A flights in Auckland FIR and expected to be available throughout South Pacific during 2011.
- Tahiti will begin testing DARP with FAA in Oct 2010.
- DARP is now available in the Nadi FIR (Fiji).

**User Preferred Route (UPR) Expansion** – identify constraints limiting the availability of UPRs and recommend action plans to remove constraints.

- UPRs are available between the North American West Coast and East Coast Australia & NZ destinations.
- Limited UPRs are available across remainder of the Pacific and Asia airspace currently.
- A UPR expansion project is underway in Australia which will see the progressive implementation of UPRs across the continent (excluding East Coast Services) by 2nd Quarter 2011.
- UPRs are available to all flights in Auckland FIR and expected to be available throughout South Pacific by 2011.

**Automatic Dependent Surveillance – Broadcast (ADS-B) Oceanic and Remote**

In-Trail Procedures (ITP) for Reduced Separation – collaborate on operational trials to harmonize procedures and collect data to support implementation of ADS-B ITP in South Pacific airspace.

- Beginning in August 2011, FAA and United Airlines will conduct a year-long operational trial of ADS-B ITP for select flights between the West Coast and Australia.

**Oceanic separation below 30/30** – collaborate on the safety and cost/benefits analysis of separation reductions in level flight, below the current minimum oceanic standards of 30nm longitudinal and 30nm lateral.

- ASPIRE Partners completed a study of the benefits of reducing oceanic separation below 30 NM and are analysing the results.

**Arrivals Optimization (Continuous Descent Approach; Tailored Arrivals)** – collaborate on development of common procedures and standards for arrivals optimization via the principles of a Continuous Descent Operation (CDO). This includes the development of Optimized Descent Profile (ODP) procedures, and the continued development of Tailored Arrivals programs.

- Six airlines participate in daily Tailored Arrivals trials into San Francisco; four airlines participate in Los Angeles. Tailored Arrivals will be moved from trials to implementation at both of these airports in 2011.
- In Australia, RNP is in implementation phase into Terminal Areas, with a completion target of 2012.
- An Optimized Descent research and development program is underway and trials into Melbourne to test and define operational concepts have begun.
- Airways NZ has implemented Collaborative Arrivals Manager (CAM) and as a result, reduced airborne delays at its two major ports - Auckland and Wellington - by 24,000mins per annum.
- CAAS has conducted operational trials with SIA from mid-2009 to mid-2010 to gain experience and is planning to conduct operational trial involving all airlines operating into Changi Airport by end of 2010.

**Departure Optimization** – collaborate on the development of standards and procedures for the efficient management of departures.

- The FAA's principal program, Pre-Departure Oceanic trajectory management 4-D (OTM4D), is a mid-term NextGen program to improve flight efficiency. Currently, a high level business case and demonstration plan is being developed.

- In Australia, Auto Release is now available at required airports and RNP optimised extraction routes are rolling out with the RNP program.
- Airways NZ is using optimizing departure trajectories on an aircraft by aircraft basis to facilitate uninterrupted climb for jets.
- CAAS does not impose speed restriction for departures from Changi Airport to facilitate uninterrupted climb.

**ASPIRE-Daily Flight Program** - Develop a program for daily city-pair flights, beginning in the SoPac based on the principles of ASPIRE Best Practices. City-pair routes will be assigned a classification (e.g. ASPIRE-4 Star) based on the availability of Best Practice procedures.

- ASPIRE partners plan to select the first ASPIRE-Daily city pair in early 2011.

**Oceanic ADS-C Climb-Descent Procedures Initiative Summary** - Collaborate on the standards development and the execution of operational trials for Oceanic ADS-C Climb-Descent Procedures (CDP).

- A one-year operational trial of ADS-C CDP in the Oakland FIR is scheduled to begin in January 2011.

**Implementation of ADS-B with VHF communications**— CAAS is currently collaborating with Indonesia and Viet Nam to progress ADS-B implementation in the South China Sea area

# DEMONSTRATION flights



## JCAB and JAL

The ASPIRE JAL flight JO77 featured B747-400 and was the fourth demonstration flight. It operated from Honolulu USA to Kansai Japan. The aircraft used advanced avionics package which took advantage of the air traffic services provided by Japan Civil Aviation Bureau (JCAB) and the FAA. The flight showcased what had been done to reduce aviation emissions across the Northern Pacific Ocean.

The flight demonstrated the savings achievable when applying ASPIRE best practice procedures across all phases of flight. Best practices achieved included User Preferred Routing, Priority Clearance, DARP, Continuous Descent Arrival, priority handling on taxiing and delayed extension of flap and undercarriage.

Aircraft weight was lightened with fibreglass cargo containers. Normally aluminium containers are used for cargo and baggage. 17 cabin attendants reduced 2.5kg per person of their belongings, such as carrying smaller portions of their cosmetics.

OPERATIONAL ITEMS	CO <sub>2</sub> SAVINGS (KG)
	426
Ground power unit and closed shades on ground	2866
Engine wash	1323
Just-in-time fueling	429
Takeoff from short-taxiing runway	977
Use of a shorter departure route	430
Highest priority for optimum altitude	1195
UPR	573
DARP	3723
CDA	859
Delayed Flap Operation	272
Delayed Gear Operation	274
Low-angle flap operation	293
Landing on short-taxiing runway	536
Idle thrust-reverse operation	160
2 Eng shut-off taxiing	290
<b>TOTAL</b>	<b>14196</b>

## CAAS and SIA

The Civil Aviation Authority of Singapore and Singapore Airlines successfully completed the world's first multi-sector demonstration ASPIRE flight, which resulted in fuel savings of about 6% and reduced carbon emissions of over 33 tonnes.

The Boeing 747-400 departed Los Angeles on Jan 31 and arrived in Singapore via Tokyo half an hour earlier than expected. ANSP partners FAA and JCAB also worked together with CAAS to ensure that the aircraft could operate in ideal air traffic conditions, from departure to cruising to arrival. The flight stamped CAAS's entry into ASPIRE.

On top of best practice operational procedures, SIA put the aircraft through a special engine wash programme to optimise fuel efficiency and also polished the airframe to reduce drag.

SIA's Senior Executive Vice-President Operations and Planning, Bey Soo Khiang, said: "Singapore Airlines is proud to participate by operating the first multi-sector demonstration green flight. The experience gained will not only set benchmarks in terms of best practices, but also help to encourage responsible environmental performance in the air transport industry. Even though we have a very young and modern fleet, we continue to adopt best industry practices to further improve fuel efficiency and therefore reduce carbon emissions. This includes strict control on the aircraft weight, regular engine wash, and airframe washes and polish programmes. For this particular flight, on top of these regular measures, we will employ real-time updates of weather conditions to chart the most efficient routing for the aircraft instead of flying a predetermined route. And upon arrival, a continuous descent approach to the airport will be adopted if conditions permit."



# MEASURING SUCCESS

One of the great successes of the ASPIRE program has been the ability of the ASPIRE partners to work closely and share data. Instead of each ASPIRE partner looking at their own part of the Asia-Pacific region, the partners are now bridging boundaries to offer a complete view of the region to generate an accurate baseline estimate of en route fuel burn. The raw data is processed for positional information and then pieced together to build trajectories which are then modelled through a fuel burn and aircraft performance calculator, OPGEN. These trajectories serve as the basis for three ASPIRE work plan initiatives: the 'ideal flight' baseline, the current fuel consumption baseline and the emissions baseline between US city pairs and Asia. The current fuel burn baseline provides an annual snapshot of the current performance of the air traffic management system against which future years can be measured based on the information available. The 'ideal flight' baseline is a

measurement of the minimum fuel burn for the flights included in the current baseline. The optimization algorithm creates a general and overly optimistic routing as it is based on an average takeoff weight, perfect wind information at all altitudes, with no time or traffic restrictions and no consideration of overflight fees. Comparing the ideal flight fuel burn and current fuel burn provides a picture of the maximum benefits available through efficiency measures.

Currently the baselines are being developed for Auckland to/from San Francisco and Auckland to/from Los Angeles using data provided by the FAA and Airways New Zealand. The baselines begin in March when data was first exchanged and will continue to be developed through next March to have a complete year of data. Later, further baselines will be developed to cover more city pairs.

To investigate the potential benefits of separation standards below 30/30 in the oceanic environment, scenarios of both current traffic and double the current number of flights were created to simulate the behaviour of the Pacific traffic for a three month time period. StepClimbs, a modelling tool, was used to simulate the aircraft behaviour by checking for optimal routing given filed ICAO flight plan as the initial route. The tool finds the most fuel-efficient routing for each flight—allowing the aircraft to change speed, altitude, and routing as long as it does not violate the separation standards. Each scenario was processed with 30/30 as the reference case and then decreasing increments of 5 NM to a 5/5 separation standard; the results from these scenarios are currently being analysed. In all scenarios, the same separation standard was applied to all aircraft.

### Tailored Arrivals for ASPIRE

The Tailored Arrivals work in Australia and overseas has clearly demonstrated the value of having a prescribed path from the enroute cruise phase to the runway. The consequent step to the ability to consistently provide a prescribed path to the runway is being able to sequence the arrival such that the aircraft descends efficiently (CDA) and arrives at points on descent at times that permit ATC to allow the CDA to continue. Consequently, the current work in Australia is focussing on how aircraft derived intent data can be understood and incorporated into ground systems to improve trajectory prediction.

Melbourne was selected as the location for research because of the generally consistent manner air traffic is processed from enroute cruise to touchdown on the runway using an arrival manager and processing traffic through Feeder Fixes. The aircraft derived intent data is being extracted via FANS and ARINC 702a intent bus downlinks from participating airlines Qantas, Emirate and Singapore. The concept to use this information will involve coarse sequencing of aircraft on the cruise to an Outer Fix prior to TOD then from there a CDA on a defined descent path and speed delivering the aircraft to the runway at the time sequenced by ATC.

### City Pair Route Rating System

The ASPIRE-Daily group has designed a "City Pair Route Rating System" that aims to identify ASPIRE partner city-pair routes that offer three or more ASPIRE Best Practice optimizations on a daily basis. ASPIRE-Daily City Pair Rating would be assigned a designation as an ASPIRE 3-Star, 4-Star or 5-Star pair, based on the number of best practice procedures available. Once in place the city pair will be monitored to ensure the advertised best practices were made available. The program has commenced and will rollout over the coming year.



SELECTED CITY PAIRS	
Number of Flights	806
Average Fuel Saving	5.5%
Standard Deviation	1.6%
Maximum Saving	9.1%
Minimum Saving	0.5%
Total Saving (kg)	~4.7 Million

**Table 1:** Initial Results of the Comparison of En Route Fuel Burn (Approximately Top-of-Climbout through Top-of -Descent) between the Current and 'Ideal Flight' Trajectories using data provided by Airways New Zealand and the FAA for March 10, 2010 through July 30th, 2010



**User Preferred Routes**

Increasing availability of User Preferred Routes in the Pacific Region is one of the key goals of the ASPIRE partners. User Preferred Routes (UPRs), as the name suggests, allow pilots and airlines to design and request a customized, fuel-efficient route.

**Traditional Routes**

The traditional method of route planning in the Pacific is simply for the airline to accept a pre-determined, published route for any given city pair. Depending on the region, these routes are either fixed or flexible. The Pacific Organized Track System—PACOTS—provides routes that are updated daily based on wind forecasts.

**Advantages of UPRs**

While PACOTS does provide good basic routing, many airlines want the ability to tailor their routes even further, and UPRs allow them to do that. Wherever UPRs are available, airlines can customize their routes based on the most updated wind forecasts, as well as aircraft characteristics and pilot preference. Once the airline has determined the preferred route for a given flight, the flight plan can be filed as usual. The flexible nature of UPRs allows pilots and airlines to save fuel and reduce emissions by being able to better avoid strong headwinds and take advantage of tailwinds. Two key advantages of using UPRs are:

- Fuel savings and emissions reductions can be substantial. Airlines reported saving an average of 234kg of fuel per flight by using UPRs on flights from Tokyo to Australia in May 2009, with one operator achieving fuel savings of 600kg per flight.
- Congestion is minimized along published routes.

**A brief history**

In 2000, UPRs were first allowed between California and the South Pacific, and since then the ASPIRE partners have gradually increased availability of UPRs. The table below summarizes the availability of the UPRs in the Pacific.

The ASPIRE partners recognize the great importance and potential environmental benefits of UPRs and are steadily reducing restrictions and expanding availability of UPRs in the Pacific without compromising safety.

**The Earl F. Ward Memorial Award**

In September 2009 ASPIRE was awarded the ATCA Earl F. Ward Memorial for outstanding achievement during the previous year, which has added to the quality, safety or efficiency of air traffic control.

AREA OF UPRS AVAILABILITY	YEAR INTRODUCED
California → South Pacific	2000
Japan → New Zealand	2007
North America → Russian Trans-East	2008
Hawaii → Asia	2008
Japan → Australia	2009
Hong Kong/Taiwan → California	2009
California → Hong Kong/Taiwan	2010

