INTERNATIONAL CIVIL AVIATION ORGANIZATION

THE SECOND MEETING OF THE APANPIRG AERODROMES OPERATIONS AND PLANNING – WORKING GROUP (AOP/WG/2)

Yogyakarta, Indonesia, 3 – 5 June 2014

Agenda Item 4: Provision of AOP in the Asia/Pacific Region

ASIA AND PACIFIC INITIATIVE TO REDUCE EMISSIONS (ASPIRE) UPDATE

(Presented by the Untied States of America)

SUMMARY

The ASPIRE Partnership was initiated in February 2008 and has achieved many milestones and successes since its inception. The ASPIRE Strategic Plan is a living document that is driving ASPIRE Partners towards actual accomplishments and operational benefits. The ASPIRE Partners have established the ASPIRE-Daily program to identify and promote city-pair routes where best practices with demonstrated and proven success in the reduction of greenhouse gasses are available on a daily basis. The ASPIRE partners are seeking to expand the partnership by encouraging airlines and ANSPs who share our environmental values to become ASPIRE partners.

Strategic Objectives:

B: ***Air Navigation Capacity and Efficiency –*** *Increase Capacity and improve efficiency of the global civil aviation system.*

E: ***Environmental Protection –*** *Minimize the adverse environmental effects of civil aviation activities.*

1. INTRODUCTION

1.1 The Asia and Pacific Initiative to Reduce Emissions (ASPIRE) is a partnership of air navigation service providers focused on environmental stewardship in the region. The ASPIRE partnership was initiated by the signing of the ASPIRE Joint Statement of Purpose by Airservices Australia, Airways New Zealand, and the Federal Aviation Administration at the Singapore Airshow on 18 February 2008. The partnership has since grown to include the Civil Aviation Bureau, Japan (JCAB), the Civil Aviation Authority of Singapore (CAAS), and Aeronautical Radio of Thailand Limited (AEROTHAI). Unlike regional collaborations focused primarily on technology demonstration, the ASPIRE partnership is a comprehensive approach to environmental stewardship for the region. Under ASPIRE, current and future partners pledge to adopt and promote best practices that have demonstrated and proven success in the reduction of greenhouse gasses, as well as to the development of work programmes to promote future gains for the environment.

2. DISCUSSION

2.1 The ASPIRE members meet annually to discuss the ASPIRE work programme, including updates from each ASPIRE member on progress and planning, and future expansion of the partnership. The members also review progress and future plans for the development of shared

metrics for fuel and emissions. Mr. Kuah Kong Beng of CAAS is the current ASPIRE chair. ANSPs and airlines interested in becoming ASPIRE partners, as well as industry representatives, are encouraged to attend the annual meeting.

2.2. The ASPIRE Partners continue to expand the ASPIRE-Daily programme to identify the most efficient city-pair routes in the region where best practices with demonstrated and proven success in the reduction of greenhouse gasses are available on a daily basis. Best practices of the ASPIRE Daily program include User Preferred Routes (UPRs) and Flexible Track Systems, Dynamic Airborne Reroute Procedures (DARP), Direct surveillance in remote areas and 30/30 Reduced Oceanic Separation, Time-Based Arrivals Management, Arrivals Optimisation, Departure Optimisation, Surface Movement Optimisation and Network Optimisation – Collaborative Decision Making.

Network Optimisation – Collaborative Decision Making (CDM) is an initiative aimed at improving Air Traffic Flow Management (ATFM) through increased information exchange among aviation community stakeholders. CDM is comprised of representatives from air navigation service providers, airport operations (e.g. stand and gate management), ground handling services, aircraft operators and other stakeholders who work together to create technological and procedural solutions to the ATFM challenges faced by the network stakeholders.

While supported by a variety of tools and technologies, collaboration transcends specific programmes and fosters a more efficient and reliable way to achieve system goals by including ATFM stakeholders in the decision-making process. By sharing information, values and preferences, stakeholders learn from each other and build a common pool of knowledge, resulting in Air Traffic Management decisions and actions that are most valuable to the system.

Adoption of the CDM principle contributes to enhancements in predictability, flexibility, cost-effectiveness, participation of aviation community and environment. Significant environmental benefits are also delivered by lowering CO2 emissions and fuel burn by reducing the time aircraft spend in the runway queue.

Surface Movement Optimisation procedures and surface and runway movement monitoring technologies have the potential to substantially improve the fuel and emissions efficiency of aircraft by reducing taxi times through improved planning of surface movements. Surface movement optimisation procedures will be aimed at minimising the delay from start request to approval, and the time/fuel burn from start approval to take off.

The ASPIRE partners recognise the potential benefit of surface and runway movement monitoring capabilities at congested airports using surveillance via radar and/or automatic dependent surveillance – broadcast (ADS-B), often enhanced by multilateration. While these surface movement systems are principally designed to enhance safety and reduce the potential for runway incursion, they also serve as the foundation for future systems that will optimise surface and runway movement.

Departure Optimisation procedures substantially improve the fuel and emissions efficiency of aircraft during the climb-to-cruise portion of flight by minimising low altitude vectoring and the need to level off at interim altitudes.

Optimisation for departure profiles include procedures to facilitate unconstrained climb to cruise level and track to route start point, and the manipulation of taxi and departure time to optimise oceanic entry altitude and position in the enroute sequence.

Departure optimisation procedures are expected to substantially improve the fuel and emissions efficiency of aircraft during the climb-to-cruise portion of flight by minimising low altitude vectoring and the need to level off at interim altitudes.

A **User Preferred Route (UPR)** during the oceanic phase of flight is defined as a lateral profile developed for each individual flight by the flight operator. These lateral profiles are customised in order to meet the specific needs of the aircraft operator for that flight, such as fuel optimisation, cost-index performance, or military mission requirements. Typically a UPR will be calculated by an aircraft operator's flight dispatch based on factors such as forecasted winds, type aircraft and aircraft performance, convective weather and scheduling requirements. A key enabler for the implementation of UPRs is the implementation of Air-Ground Datalink Communications. In circumstances where fixed routes are in use and the implementation of UPRs in continental airspace is not practicable in the medium term, flexible track systems can be considered as an interim best practice as they are vastly more efficient than fixed ATS routes.

Dynamic Airborne Reroute Procedures (DARP) refers to an oceanic in-flight procedure to periodically modify the lateral profile of a flight in order to take advantage of updated atmospheric conditions and updated forecasts. Typically, flight operators file flight plans some hours prior to a flight's estimated time of departure. Often, revised upper wind forecasts are available after the flight plan is filed or the aircraft departs. DARP allows aircraft operators to calculate revised profiles from the aircraft's present position to any subsequent point in the cleared route of flight in order to realise savings in fuel or time. This updated profile is coordinated by the Airline Operations Centre (AOC) with the flight crew, and sent to ATC as a reroute request from the aircraft.

30/30 Reduced Oceanic Separation allows more aircraft access to optimum routings and altitudes; the enhanced efficiencies of optimum routes and altitudes can result in lower fuel burn and reduced emissions. This enhanced efficiency is reflected in lower fuel burn and reduced emissions as more aircraft can fly closer to optimal tracks and altitudes.

Time Based Arrivals Management reduces the environmental impact of delays caused by the demand placed on airports. ANSPs have introduced traffic flow management procedures and automated decision support automation to reduce arrivals congestion into high-density airspace and improve fuel and emissions efficiency by shifting delays to the less congested enroute phase of flight.

Arrivals Optimisation includes any one of several procedures available to aircraft operators and ANSPs to improve the fuel efficiency for aircraft during final descent phase of a flight. Arrivals Optimisation minimises fuel burn for the arrival segment by enabling each jet to fly the optimum track to Top of Descent (TOD) and an Optimised Profile Descent (OPD) from TOD to the landing runway. Qualifying arrivals optimisation procedures include continuous descent arrivals, continuous descent approaches, optimised profile descents, tailored arrivals, and are generally referred to by ICAO as Continuous Descent Operations.

2.3. The partners continue to work with the International Air Transport Association (IATA) Asia Pacific office to assess and validate the ASPIRE-Daily best practices, city pair nominations and ratings. ASPIRE-Daily city pairs are certified with a star rating system based on the number of best-practice procedures available.

Number of Best Practices	Star Rating
3	3
4-6	4
7 or more	5

2.4. Since its inception, the ASPIRE-Daily program has validated nineteen city pairs:

Auckland – San Francisco (four stars)
Los Angeles – Singapore (four stars)
Los Angeles – Melbourne (four stars)
Sydney – San Francisco (four stars)
Singapore – Melbourne (four stars)
Melbourne – Singapore (four stars)
Singapore – Sydney (three stars)
Sydney – Singapore (four stars)
Melbourne – Los Angeles (four stars)
Sydney – Los Angeles (four stars)
Auckland – Singapore (four stars)
Christchurch – Singapore (four stars)
Singapore – Auckland (three stars)
Singapore – Christchurch (three stars)
Tokyo (HND) – San Francisco (three stars)
Bangkok – Sydney (four stars)
San Francisco – Auckland (four stars)
Auckland – Los Angeles (four stars)
Los Angeles – Auckland (four stars)

Additional city pairs are under development.

2.5. The 2013 ASPIRE Annual Report and Strategic Plan were published in December 2013 to the ASPIRE website (www.aspire-green.com).

2.6. At the most recent annual meeting in April 2014, the ASPIRE partners discussed further expansion of the partnership to include additional air navigation service providers and airlines in the region. Recognising that the greatest benefit will be delivered through the broadest collaboration, the ASPIRE partners are seeking to expand the partnership by encouraging airlines and ANSPs who share our environmental values to become ASPIRE partners. Interested providers will be asked to demonstrate clear environmental initiatives in their current or near term work programmes that contribute to and align with the overall goals of ASPIRE. Airports Fiji, Cathay Pacific and Emirates are all in the process of becoming ASPIRE partners. For more information on becoming an ASPIRE partner, please contact the ASPIRE chair at KUAH_Kong_Beng@caas.gov.sg.

2.7 To further the aims of ASPIRE, and widen its reach within the region, Cathay Pacific in conjunction with IATA conducted a series of four near simultaneous ASPIRE demonstration flights originating in Hong Kong on 20 November 2013. The flights chosen represented the breadth of flight profile types relevant to the ASPIRE programme (medium haul regional and ultra-long/long haul oceanic) and offered several publicity angles that have not been present in previous demonstration flights (multiple flights across a day of operations, two at once in Australian airspace, cargo, first of type, first to Anchorage etc.). A report on the findings is being developed by Cathay Pacific and IATA and will be posted on the ASPIRE website as soon as it is available.

2.8 The ASPIRE partners also recognised at the 2014 annual meeting that there needs to be a greater effort on our part to better align our activities with CANSO, both at the regional level and globally through the CANSO Environmental Working Group.

3. ACTION BY THE MEETING

3.1 The meeting is invited to note the information provided and to consider possible opportunities for cooperation.