C/CAR WG/7 - IP/08
International Civil Aviation Organization ***Revised 18/06/09***
North American, Central American and Caribbean Office (NACC)
Seventh Central Caribbean Working Group Meeting
(C/CAR WG/7)
Mexico City, Mexico, 13 to 16 July 2009

Agenda Item 2: Review of Air Navigation matters
2.3 Air Navigation specific activities
2.3.1 Air Traffic Management (ATM)

FAA INITIATIVES IN OCEANIC AIRSPACE

(Presented by the United States)

SUMMARY	
The paper provides a summary of the FAA Oceanic Initiatives and associated timelines.	
Strategic Objectives	*This information paper is related to ICAO Global Performance Initiative (GPI-5) – Performance Based Navigation*

1. Introduction

1.1 The United States (U.S.) is developing, testing, and implementing several Oceanic Initiatives. The U.S. is involved in projects in various stages from the Caribbean and the South Pacific to the Arctic. The intent of this paper is to share the types of projects that the U.S. is involved in and encourage other States to engage in initiatives to increase efficiencies and reduce emissions.

2. Discussion

2.1 West Atlantic Route System (WATRS+) Route Structure Redesign and Lateral Separation Reduction

- Implemented in June 2008
- WATRS route structure redesigned to add approximately 40% more routes and associated altitudes
- Lateral separation reduced from 90NM to 50NM between RNP 10 or RNP 4 aircraft
- Projected daily CO2 fuel emission reduction of 443,000 kg
- Projected annual savings of up to 161,800,000 kg of CO2

2.2 Gulf of Mexico (GoM) RNAV/RNP Project

- 50 NM lateral separation reduction to be used for route structure redesign
- Route restructure coordination ongoing
- Airspace analysis
- Concept of operations
- Benefits evaluation
- Safety assessment

2.3 Arctic RNP 10 Lateral Separation Reduction Project

- 50 NM lateral separation reduction to be used for route structure redesign
- Joint project with Canada. First step for Global Harmonization of separation standards in the Arctic

2.4 User Preferred Route (UPR) Expansion

- Users choose optimum routes based on individual airframes to maximize the efficiency of the route at the time of flight planning
- In December 2000, use of UPRs began between U.S and the South Pacific, replacing the South Pacific Organized Track System (PACOTS) generated tracks in that region of the Oakland OCA/Flight Information Region (FIR).
- In September 2007, operational use of UPRs began between Asia and New Zealand/Caledonia
- UPR trials began in the Central East Pacific (CEP) in 2008 between:
  - 1) California and Hawaii;
  - 2) Sydney/Brisbane and Narita;
  - 3) California and Singapore.
- Annual Savings
  - Estimated (2008)
    - Los Angeles to Singapore up to 1,000,000 kg fuel or 3,160,000 kg of CO2
    - Australia to Japan up to 1,000,000 kg fuel or 3,160,000 kg of CO2
    - New Zealand/Caledonia to Japan up to 1,090,000 kg fuel or 3,444,400 kg of CO2
  - Realized
    - Russian Trans East: 1,090,000 kg fuel or 3,410,000 kg CO2
    - California-South Pacific: 1,272 kg fuel or 4,015 kg CO2 savings/flight
    - Asia-New Zealand/Caledonia: 2,090,000 kg fuel or 6,540,000 kg CO2
    - Asia-Hawaii: 2,270,000 kg fuel or 7,100,000 kg CO2
    - RJAA-YSSY/YBBN/YBCG/YBCS 1,890,000 kg or 5,910,000 kg CO2
  - Total Savings
    - More than 7,340,000 kg fuel or 22,970,000 kg of CO2

2.5 Dynamic Airborne Reroute Programs (DARP)

- Allows airborne aircraft to take advantage of updated atmospheric conditions
- Oakland ARTCC (ZOA) and Auckland OAC currently support DARP for flights crossing the Oakland/Auckland common boundary

- Complete a PACOTS Track 14/15 DARP trial (Hong Kong/Taipei to KSFO/KLAX) and use the trial results to implement DARP in the Central Pacific

2.6 Russian Trans-East (RTE) Flex Track Trials

- Beginning October 2007, three flexible tracks were published daily
- Savings of up to 40 minutes flying time per flight
- In February 2008 UPRs developed between west coast Californian airports, the Vancouver, B.C. airport and six route entry points

2.7 30 NM Lateral/30 NM Longitudinal Separation (30/30) and Use of 50 NM Longitudinal Separation

- June 2007: Operational trials in Oakland FIR implemented.
- Oakland Oceanic CTA averages 638 flights per day. 35% of those flights use Automatic Dependent Surveillance (ADS) and 12% of total flights are eligible for application of 30/30.

2.8 30 NM Lateral/30 NM Longitudinal Separation (30/30) in New York Flight Information Region (FIR)

- Developing an Initiative Identification Document for 30/30 in the New York Oceanic CTA

2.9 50 NM Longitudinal Separation Standard in the Anchorage FIR

- October 2008: Operational trial begun
- Anchorage's ability to participate in ADS-C separation permits uniformity across all of the U.S. controlled Pacific FIR boundaries

2.10 ADS-C In-Trail Procedures (ITP)

2.10.1 Provides reduced longitudinal separation between aircraft pairs when one aircraft is in level flight, and the second is climbing or descending through the altitude of the first

- 2008: Business Case completed
  - Based on ZOA traffic with 35% Future Air Navigation System (FANS) equipage rate
  - Projected total combined fuel savings up to 44,000 kg or 139,040 kg of CO2per day
  - Based on ZOA traffic with 100% FANS equipage rate
  - Potential savings of nearly 88,000 kg of fuel or 278,080 kg CO2per day
- 2009: Collision risk modeling underway
- 2010: Operational trials proposed

2.11 Asia and South Pacific Initiative to Reduce Emissions (ASPIRE) – Oceanic Work Plan

- Partnership of air navigation service providers focused on environmental stewardship
- August 2007: the FAA presented a series of near and mid-term Pacific initiatives to the Asia Pacific Economic Cooperation forum on Aviation Emissions
- Strategic Goals:

- Identify technical and procedural activities that have environmental benefits
- Initial focus is on US West Coast to Australia flights
- Quantify environmental benefits for numerous South Pacific enhancements over the last decade
- Establish fuel and emissions baseline for today's operations and performance benchmarks for future operations
- Promote regional procedural and technical service improvement via recommended best practices

2.12 Atlantic Interoperability Initiative to Reduce Emissions (AIRE) – Oceanic Work Plan

- Increase operator efficiency
- Increased system precision and enhanced automation
- Reduce fuel burn
- Improve predictability
- Reduce greenhouse gas emissions (AIRE initiative)
- Increase oceanic traffic flow capacity
- AIRE Gate-to-Gate Green Flight for June 09 Paris Air Show
  - Plan and execute the first coordinated Gate-to-Gate AIRE demonstration in conjunction with the upcoming June, 2009 Paris Air Show.
- New York Center, in partnership with Santa Maria ACC and Air France, has agreed to participate in a series of flight navigation and ATC ground based system demonstration trials, which are being conducted under the AIRE agreement.
  - Analyze AIRE demonstration performance metrics and establish baseline to measure fuel consumption and emissions for current transatlantic flights in order to demonstrate fuel savings and emissions reductions
  - Investigate the use of existing oceanic systems and oceanic trajectory optimization tools to improve fuel savings and reduce emissions
  - Expand AIRE demonstration activities and partnerships with airlines, other government agencies and industry partners

2.13 Oceanic Tailored Arrivals (OTA)

- Customized optimal approach profile up-linked to an aircraft via FANS data link using the ATOP system to provide a fuel-efficient, low-noise descent profile
  - December 2007: Trials began for Pacific Oceanic flights transitioning for San Francisco International Airport (SFO) arrivals
    - Projected savings of up to 800 pounds of fuel per flight on an approach
  - September 2008: Miami Tailored Arrivals (TAs) Trials demonstrate and prove OTA concept in East Coast environment
  - October 2008: Operational development of Los Angeles International Airport (LAX) OTAs began
- Benefits to date
  - Dec 2007 thru Dec 2008 aircraft participating in SFO trials collectively used 2,000,000 pounds less fuel and reduced carbon dioxide emissions by 6,000,000 pounds according to Boeing data
  - On average Boeing 777s flying full TAs used 1,303 lbs less fuel
  - On average Boeing 747s flying full TAs used 2,291 lbs less fuel

3. Conclusion

3.1 The meeting is invited to note the information presented in this paper.

3.2 The following point of contact information is being provided for anyone who may have further questions on any of the items presented in this information paper:

Susan Horn
FAA
Oceanic and Offshore Operations
U.S. 202-493-5458
Susan.e.horn@faa.gov

- END -