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Agenda Item 3:

Air Navigation Matters 3.6. Other Air Navigation issues

WEST ATLANTIC ROUTE SYSTEM (WATRS)-PLUS AIRSPACE REDESIGN AND SEPARATION REDUCTION INITIATIVE

(Presented by the United States of America)

SUMMARY

The United States has begun to coordinate plans and requirements to implement an airspace redesign and lateral separation reduction in the West Atlantic Route System, including the Miami Oceanic airspace and the San Juan Flight Information Region (FIR) airspace (now identified as WATRS-Plus airspace). This initiative can enhance airspace capacity, air traffic control (ATC) flexibility and aircraft operating efficiency. This paper provides details on tasks to be accomplished, a draft airspace redesign chart and discussion of operational requirements under development.

1. Introduction

1.1 The West Atlantic Route System (WATRS) was redesigned in 1995 to provide more efficient operations. This revision eliminated many restrictive routing requirements, and prepared the airspace for the introduction of Reduced Vertical Separation Minima. We now see the opportunity to further enhance WATRS operations by implementing a reduced lateral separation minimum and redesigning the route system to increase both capacity and operating efficiency. Improvements to aircraft navigation and ground ATC capability, including the use of the Ocean21 automation system at New York Center, enable us to pursue this opportunity. We have designated this effort as the "WATRS-Plus¹ Airspace Redesign and Separation Reduction Initiative" (WATRS-Plus airspace is depicted in **Appendix A**).

1.2 To progress international coordination, the Federal Aviation Administration (FAA) is working with the International Civil Aviation Organization (ICAO) North American, Central American, and Caribbean (NACC) Regional Office and with the ICAO European and North Atlantic (EUR/NAT) Office to provide inputs to the appropriate North Atlantic (NAT), Caribbean (CAR), and South America (SAM) working groups and to revise the appropriate ICAO documents. In addition, the NACC and the FAA convened a NAT/CAR ATS Routes Group meeting in September 2006 to continue work on this initiative and have coordinated to establish a Routes Working Group for this project.

¹ WATRS-Plus refers to the designated route system and surrounding FAA-controlled airspace.

1.3 The initial meeting of the NAT/CAR ATS Routes Working Group was held on 19-21 September 2006 in Miami, Florida. The meeting was attended by technical and operational representatives from four CAR States, the International Air Transport Association (IATA), five major operators, the U.S. Air Transport Association, the National Business Aviation Association, IFATCA and the U.S. Department of Defense. The group reviewed basic program plans and requirements, reviewed and re-worked a draft airspace redesign chart and conducted discussions to harmonize the redesign plan with adjoining ATS route structures.

1.3.1 During the meeting, the group reviewed project progress to date, provided inputs concerning supporting tasks and events, discussed operator and aircraft Required Navigation Performance 10 (RNP 10) requirements, developed airspace redesign chart <u>draft</u> 060921 (see **Appendix B**) and identified ATS provider/airspace operator issues to be addressed. The group reached the following basic agreements:

- a) The United States will submit a WATRS-Plus Action Plan to ICAO/NACC after internal coordination and will continue work on the project through coordination with affected States, Air Traffic Service Providers (ATSP), and airspace operators;
- b) ICAO/NACC will conduct international coordination as needed; and
- c) information dissemination including an action plan with timelines is vital to success of the WATRS-Plus project.

Note: Draft redesign chart 060921 will require further coordination. For example, route "Q" will probably not be anchored at BETIR as is shown on the current draft.

1.3.2 In addition, the United States took the action to coordinate with ATSPs that were unable to attend the Miami meeting. This action and others are documented in the list of tasks and action items included in the meeting report.

1.3.3 Working papers from the meeting are posted on the NACC Office Website (<u>www.icao.int/nacc</u>) under "Meetings". Presentations given at the meeting can be found at: <u>www.faa.gov/ats/ato/natcar_wg.htm</u>

2. Program Overview

2.1 The United States announced the WATRS-Plus Airspace Redesign and Separation Reduction Initiative at the Twelfth Meeting/Workshop of ATM Authorities and Planners in the CAR/SAM Regions (AP/ATM/12) in Lima, Peru, at the North Atlantic Implementation Management Group (NAT/IMG) in May 2006, and in June 2006 at the North Atlantic System Planning Group (NAT/SPG) in Paris. The initiative is led by the United States (FAA Oceanic Separation Reduction Working Group - OSRWG), which is chaired by FAA's Oceanic Standards office.

- 2.2 The project has the following major objectives:
 - a) reduce lateral separation from 90 nm to 50 nm for aircraft/operators approved for RNP 10 or better;
 - b) have WATRS-Plus operators obtain operational approval for RNP 10 or better from the appropriate State authority;

- c) redesign WATRS-Plus airspace to enable more efficient operations and enhance enroute efficiency/capacity; and
- d) harmonize WATRS-Plus transition to/from the Caribbean and North Atlantic Regions' airspace and/or route structures.

2.3 **Target Implementation Date**. The United States plans to announce the target implementation date later this year after a final review of all technical and operational factors affecting the implementation schedule. In consideration of various implementation issues, the United States is now considering an implementation date in June 2008.

2.4 **United States - FAA Center Participation**. The following FAA centers are participating in the project: New York, San Juan, Miami, Jacksonville and Washington Centers.

2.5 **ICAO and International Group Coordination**. As noted above, in coordination with the ICAO NACC and EUR/NAT offices, the United States will provide inputs and updates and will obtain feedback from the appropriate ICAO groups.

2.6 **Industry Coordination**. As the project progresses, the United States will continue to coordinate with the appropriate national and international industry groups and operators.

2.7 **Key Tasks**. The following are key tasks that the United States has identified to date to continue the project to implementation:

- a) Establish a concept of operations (see draft WATRS-Plus Concept of Operations at **Appendix C**);
- b) assess United States rulemaking requirements;
- c) publish and coordinate aircraft/operator authorization requirements/documents for use by United States and international operators as well as State aviation authorities;
- d) conduct airspace analysis, redesign, and ATC simulations;
- e) address impacts to ATC automation and make modifications as needed;
- f) conduct operator information and education programs as needed;
- g) coordinate program requirements and issues with adjoining ATSPs, other State regulators, and ICAO;
- h) conduct safety analysis to support document revisions and implementation decisionmaking;
- i) revise appropriate ICAO and FAA documents;
- j) educate FAA Flight Standards Field Offices and inspectors;
- k) complete necessary FAA ATC Center actions; and

1) track and assess operator/aircraft fleet readiness for reduced lateral separation to be applied.

3. Concept of Operations

3.1 A draft "WATRS-Plus Concept of Operations" is posted at Appendix C. This draft was reviewed at the ATS Routes Working Group in Miami. The draft proposes vertical and horizontal boundaries of WATRS-Plus Airspace, operational policies for transition airspace and application of lateral separation standards, operator/aircraft requirements for RNP 10 and timeframes for implementation target dates.

3.2 The draft document states that RNP 10 will be the <u>minimum</u> operator/aircraft navigation requirement for 50 nm lateral separation to be applied. An FAA survey of equipage for aircraft operating in WATRS airspace has indicated that a significant majority of the aircraft will meet RNP 10 technical requirements without modification.

- 3.2.1 The following are the basic operator and aircraft requirements for RNP 10:
 - a) Operators/aircraft must meet the authorization criteria published in ICAO Doc 9613 (Manual on RNP), Appendix E or FAA Order 8400.12A (RNP 10 Operational Approval) (as amended);
 - b) aircraft must be equipped with two operational Long-Range Navigation Systems (LRNS) meeting RNP 10 standards; and
 - c) there is a 6.2-hour time limit between position updates for aircraft on which the Inertial Navigation System (INS) or Inertial Reference Unit (IRU) serve as the only LRNS, unless an extended time limit has been approved. (Extended RNP 10 time limits of 10 hours & greater have been approved for many IRU systems. The RNP 10 time limit should only be an issue in WATRS-Plus airspace for INS-only equipped aircraft on westbound flights entering the airspace from Europe, Africa and the Mid-East).

3.2.2 Aircraft that do not have RNP 10 approval or better can file a Flight Plan in WATRS-Plus airspace at any altitude; however, the FAA anticipates that aircraft approved for RNP 10 may be more likely to obtain their preferred route and altitude. The FAA is conducting an investigation, including traffic simulation, with the purpose of establishing appropriate measures to accommodate non-RNP 10 approved aircraft.

4. Significant Near-Term Actions

- 4.1 The following are United States priority efforts for the remainder of this year:
 - a) Coordinate the initial version of the Action Plan for implementation;
 - b) Continue to coordinate the Concept of Operations document;
 - c) Perform studies and simulations to validate policies and procedures to accommodate a small percentage of non-RNP 10 aircraft; and

d) Finalize and announce target implementation date and basic operator/aircraft requirements for implementation of the airspace redesign, reduced lateral separation and RNP 10. An advance copy of the U.S. NOTAM to be published on 21 December 2006 is contained in **Appendix D**.

5. Actions Suggested:

- 5.1 The meeting is invited to:
 - a) review the information in this paper and provide comment on plans and issues related to the WATRS-Plus airspace redesign and separation reduction; and
 - b) identify any issues that may delay the new target implementation date of June 2008.

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APPENDIX A

WATRS-PLUS AIRSPACE BOUNDARY CHART



APPENDIX B

AIRSPACE REDESIGN CHART DRAFT 060921



APPENDIX C

FAA Draft WATRS-Plus Concept of Operations

1. Vertical and horizontal boundaries of airspace

a. <u>Horizontal Boundary.</u> The coordinates defining the horizontal boundary of WATRS airspace are published in ICAO Doc 7030, NAT and CAR Supplementary Procedures and on the WATRS-Plus Webpage (www.faa.gov/ats/ato/xxxx.htm). "Plus" refers to airspace in Miami Oceanic, New York Oceanic and the San Juan FIR through which fixed ATS routes transit to WATRS. A chart depicting the WATRS-Plus boundaries is published on the WATRS-Plus Webpage.

b. <u>Vertical Boundary.</u> WATRS-Plus airspace extends from the floor of controlled airspace to FL _____TBD.

2. Transition airspace

a. Transition airspace is defined as airspace adjoining WATRS-Plus airspace where 50 nm lateral separation may be applied between aircraft approved to RNP 10 or better that are in transit to or from WATRS-Plus airspace.

b. The following areas are considered transition airspace: TBD

3. Lateral separation standard(s) to be applied

a. <u>50 nm Lateral Separation.</u>

(1) <u>WATRS-Plus Airspace</u>. 50 nm lateral separation will be applied between aircraft pairs approved for RNP 10 or better regardless of their altitude in WATRS-Plus airspace.

(2) <u>Transition airspace</u>. 50 nm lateral separation may be applied between aircraft approved to RNP 10 or better that are in transit to or from WATRS-Plus airspace.

b. <u>90 nm Lateral Separation.</u> 90 nm lateral separation will be applied whenever one or both aircraft in a pair are <u>not</u> authorized RNP 10.

c. <u>Operator Filing Requirement.</u> Operator/aircraft that are approved RNP 10 (or better) that file an <u>oceanic route</u> that falls within WATRS-Plus airspace boundaries must file a flight plan equipment suffix that shows that capacity. Operators must file the flight plan equipment suffix on their (ICAO) flight plan that correctly indicates their approved navigation capability.

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4. Provisions for accommodating aircraft <u>not</u> meeting RNP 10 or better

a. Aircraft that do not have RNP 10 approval or better can file in WATRS-Plus airspace at any altitude; however, the FAA anticipates that aircraft approved for RNP 10 may be more likely to obtain their preferred route and altitude. The FAA is conducting investigations, including traffic simulation, with the purpose to establish appropriate measures to accommodate non-RNP 10 approved aircraft.

5. Aircraft Population RNP 10 Authorization Objective

a. <u>Implementation Objective:</u> <u>Percentage of Flights Authorized RNP 10 or better.</u> The WATRS-Plus Task Force will progress its work [CAN'T SAY THIS. HOW ABOUT "WORK TOWARD THE OBJECTIVE?] with the objective of having approximately <u>85% of flights</u> in WATRS-Plus airspace approved for RNP 10 or better by one month prior to the project implementation date.

b. <u>RNP 10 or Better Compliance To the Maximum Extent Possible.</u> The WATRS Plus Task Force will advocate that <u>all operators/aircraft</u> that fly in WATRS-Plus airspace obtain RNP 10 or better approval.

6. Concept for use of Ocean21 in New York Oceanic Airspace

Ocean21 will provide the New York Oceanic air traffic controller with a set of automated tools to assist in assuring that the correct separation is applied between aircraft with a mix of navigation capabilities (i.e., RNP 10 or better, non-RNP 10). Automated tools will include automated conflict prediction and reporting (CPAR), graphic dynamic situation display to the controller, and interactive electronic flight strips, aircraft labels and aircraft position symbols.

7. Concept for use of fixed tracks or routes

Fixed tracks will be planned based on a 50 nm lateral separation minima. ["MINIMA" is plural – should probably use "minimum" here, or delete the "a" in front of "50 nm".]

8. Concept for transfer of control to adjoining FIR's

a. <u>Transfer of Flights into non-U.S. Controlled NAT MNPS Airspace.</u> New York Center will provide currently established (60 nm) lateral separation minima when transferring aircraft transiting to non-US controlled NAT MNPS airspace.

b. <u>Transfer to Other Oceanic FIRs.</u> Aircraft transiting FAA-controlled airspace to other Oceanic FIRs will be transferred with the applicable separation standard per regional documentation.

c. <u>Transition airspace.</u> TBD

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9. Flight Plan Equipment Suffix Requirements

<u>ICAO Flight Plans.</u> To inform ATC and to key Ocean21 automation that they have RNP 10 or better authorization and are eligible for 50 nm separation, operators <u>must</u> annotate item 10 (Communication, Navigation and Approach Equipment) of the ICAO Flight Plan with the appropriate equipment suffix.

Note 1: In the ICAO Flight Plan, letter "R" currently indicates that the aircraft will maintain the appropriate RNP type for the entire flight through airspace where the RNP type is applied.

Note 2: The ICAO Flight Plan Study Group is reviewing flight plan policies including aircraft equipment suffixes. The WATRS-Plus Task Force will maintain contact with the appropriate FAA and ICAO organizations to track pertinent ICAO flight plan change developments.

10. Aircraft/operator authorization requirements (equipage, RNP 10 authorization documents)

a. For 50 nm lateral separation to be applied, operators will be required to obtain RNP 10 or better approval from the appropriate State authority.

b. <u>Guidance to be used</u>, ICAO Document 9613, FAA Order 8400.12 (as amended) and FAA Order 8400.33 will be used as guidance for States and operators.

Note: ICAO Doc 9613 is in the process of being incorporated into the ICAO Performance-Based Navigation Manual.

11. Target Dates:

a. <u>Implementation Decision Date:</u> calendar date, 3 months prior to target implementation date.

b. <u>Operator/aircraft RNP 10 or better Approval Date:</u> AIRAC [WRITE OUT ACRONYM FOR FIRST USE] date, 1 month prior to target implementation date.

c. <u>Target Implementation Date:</u> AIRAC date, when the new 50 nm lateral separation standard and airspace redesign will be applied. Currently planned for June 2008.

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APPENDIX D

ADVANCE COPY (22 Nov 06)

(Notice to be published in 21 Dec 06 edition of Domestic/International Notices To Airmen (<u>http://www.faa.gov/NTAP/index.htm</u>)).

WATRS PLUS AIRSPACE REDESIGN & SEPARATION REDUCTION INITIATIVE

TARGET IMPLEMENTATION DATE: 5 June 2008

Introduction. On 5 June 2008, the FAA is planning on introducing a redesigned route structure and a reduced lateral separation standard in WATRS Plus Airspace. WATRS Plus Airspace is depicted on the attached chart. It includes the West Atlantic Route System (WATRS), Miami Oceanic airspace in the Atlantic and the San Juan FIR.

Background. In 1998, lateral separation was reduced to 50 nm in conjunction with the introduction of Required Navigation Performance 10 (RNP 10) for aircraft operating on the North Pacific Track System. Since that time, application of 50 nm lateral separation and RNP 10 has been expanded throughout the Pacific Flight Information Regions (FIR). The WATRS Plus initiative will apply the experience gained in the Pacific.

FAA studies show that approximately 90% of flights in WATRS Plus airspace are conducted by aircraft that already meet RNP 10 or better requirements. To obtain RNP 10 or better authority, operators must apply to the responsible State authority. Applicable documents are discussed below.

Project Objectives. The objectives of the WATRS Plus project are to:

- Reduce lateral separation from the existing 90 nm standard to 50 nm between aircraft authorized Required Navigation Performance 10 (RNP 10) or better.
- Have a significant percentage of WATRS Plus operators obtain RNP 10 (or better) authority from the appropriate State authority.
- Accommodate operation of the small percentage of flights projected not to meet RNP 10 or better. See the discussion below.
- Redesign the WATRS Plus route structure to make approximately 40% more routes available to enhance operator access to time/fuel efficient routes and altitudes and to enhance enroute capacity.
- Harmonize the WATRS Plus route structure with that in the Caribbean and North Atlantic regions

Operator Action By 5 May 2008. To the maximum extent possible, operators flying oceanic routes in WATRS Plus Airspace between flight level (FL) 290-410, where competition for routes and altitudes is greatest, should obtain RNP 10 or better authority **by 5 May 2008**. To enhance operational flexibility, the FAA also recommends that operators flying oceanic routes above or below those FL's obtain RNP 10 or better authority.

Having operators RNP 10-ready one month in advance of the implementation date will help the transition to the new route structure and separation standard on 5 June 2008. The FAA will track the authorization status of operator/aircraft combinations that operate in WATRS Plus airspace to confirm that the fleet will be RNP 10-ready on time.

Accommodation of Aircraft Not Authorized RNP 10 Or Better (Non-RNP 10 Aircraft). Aircraft that are authorized RNP 10 or better will have a better opportunity of obtaining their preferred altitude and route because the 50 nm lateral separation standard will be applied to those aircraft. Non-RNP 10 aircraft will be separated laterally from all other aircraft by 90 nm.

The following basic operating policies will apply:

1. Non-RNP 10 operators/aircraft will be able to file any route at any altitude in WATRS Plus airspace. They will be cleared to operate on their preferred routes and altitudes as traffic permits.

2. Non-RNP 10 aircraft will retain the option of climbing to operate at altitudes above those where traffic is most dense (i.e., at/above FL 410). To minimize the chance of conflict with aircraft on adjacent routes, Non-RNP 10 aircraft should plan on completing their climb to or descent from higher FL's within radar coverage.

3. All aircraft can enhance their opportunity to be cleared on their preferred route and altitude if they operate at non-peak hours, approximately 0100 to 1100 UTC.

4. 50 nm lateral separation will be applied at any altitude in WATRS Plus Airspace when aircraft are authorized RNP 10 or better.

RNP 10 Criteria For Operators and Aircraft

Criteria for aircraft and operator RNP 10 authorization is contained in FAA Order 8400.12A (*RNP 10 Operational Approval*) (as amended) and in Appendix E of ICAO Document 9613 (*Manual on RNP*). (FAA Order 8400.12A is being revised to eliminate dated information on manual Letters of Authorization for General Aviation operators). Both of these documents are currently available on the Pacific CNS Website (<u>www.faa.gov/ats/ato/cns.htm</u>) and will be posted on the WATRS Plus Webpage. See below.

RNP 10 criteria includes:

1. A requirement for two operational Long-Range Navigation Systems (LRNS) meeting RNP 10 standards.

2. Unless approved otherwise, an RNP-10 time limit of 6.2 hours between position updates for aircraft on which Inertial Navigation Systems (INS) or Inertial Reference Units (IRU) provide the only source of long range navigation.

Note: extended RNP-10 time limits of 10 hours and greater are already approved for many IRU systems. Time limit may be an issue for INS only equipped aircraft on westbound flights entering WATRS Plus airspace from Europe, Africa and the Mid-East.

Policy/Procedures Information For Operators and Regulators.

1. By 31 December 06, information on policies and procedures related to the introduction of 50 nm lateral separation and RNP 10 or better will be posted on a "WATRS Plus Webpage". The WATRS Plus Webpage will be linked to the existing Oceanic/International Operations Standards Group Homepage at: www.faa.gov/ats/ato/130.htm

2. It is recommended that regulators and operators review the briefing entitled "Operational Approval For RNP 10" posted on the WATRS Plus Webpage. This briefing provides details on RNP 10 aircraft and operator requirements.

3. By 31 January 07, an information package on RNP 10 authorization policies and procedures will also be posted on the WATRS Plus Webpage. In addition, the FAA will work with ICAO regional offices to disseminate the package to appropriate State authorities and industry.

4. As the project progresses, the FAA will coordinate with ICAO, other authorities and industry to take additional measures to disseminate information, as necessary.

ICAO Coordination. The FAA is coordinating this project with the ICAO working groups in the North Atlantic and Caribbean regions. The FAA is working with the ICAO North American, Central American and Caribbean (NACC) Office in Mexico City and the European and North Atlantic Office in Paris to progress the work, revise the necessary documents and inform operators and regulatory authorities of program requirements.

Industry Coordination. As the project progresses, the FAA will coordinate with and inform U.S. and international industry groups on a regular basis. The project leads listed below will ensure that industry groups are informed of program requirements and progress.

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