International Civil Aviation Organization
NORTH AMERICAN, CENTRAL AMERICAN AND CARIBBEAN OFFICE
Meeting of the North Atlantic/Caribbean ATS Routes Working Group (NAT/CAR WG)
Miami, Florida, USA, 19-21 September 2006

Agenda Item 1: Background and Framework

WATRS PLUS PROJECT - DISCUSSION MATERIAL

(Presented by the United States)

SUMMARY

The discussion material attached to this WP addresses activities necessary for introduction of RNP 10 and airspace redesign.

1. Introduction

1.1 The attachments to this working paper contain discussion material for Agenda Item 1.

Attachment A	WATRS Plus Project Summary
Attachment B	Draft Concept of Operations
Attachment C	RNP 10 Operational Approval Outline
Attachment D	Summary of FAA Major Tasks and Document Updates.

2. Suggested Action

2.1 The meeting is invited to review the attached material in preparation for Agenda Item 2 discussions.

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APPENDIX A

WATRS PLUS SEPARATION REDUCTION INITIATIVE AND AIRSPACE REDESIGN PROJECT SUMMARY

Introduction: The FAA announced the WATRS Plus Airspace Redesign and Separation Reduction Initiative at AP/ATM/12 in Lima (CAR/SAM ATM Authorities and Planners), and at NAT/IMG and NAT/SPG in Paris. The initiative is led by FAA's Oceanic Separation Reduction Working Group (OSRWG), which is chaired by FAA's Oceanic Standards office (AJE-32).

Project Objectives:

- Reduce lateral separation from 90 nm to 50 nm for aircraft/operators approved for RNP 10 or better.
- WATRS Plus operators obtain operational approval for RNP 10 or better from the appropriate State authority.
- Redesign WATRS airspace to enable more efficient operations and enhance en-route efficiency/capacity.
- Harmonize WATRS transition to/from Caribbean and North Atlantic Region's airspace and/or route structures.

Target Implementation Date: approximately two years (TBD at Summer-Fall 2006 meetings)*
*Note: 50 nm lateral separation approval (ICAO Doc 7030 Amendment processing) will be requested and may be approved well before implementation of airspace redesign; however, the reduced separation minima will not be implemented until the TBD implementation date, when the airspace is redesigned.

FAA Center Participation: New York, San Juan and Miami Oceanic; Jacksonville, Washington, Boston.

ICAO Group Coordination: GREPECAS, North Atlantic System Planning Group (NAT/SPG)

Industry Coordination: national and international industry groups

Near-term Meeting and Event Schedule:

Date	Location	Meeting or Event
6/13-6/14/06 √	Washington	Initial FAA WATRS Plus Task Force meeting
6/13-6/16/06 √	Paris	WP presented at NAT/SPG
7/25-7/27/06 √	Washington	FAA WATRS Plus airspace redesign meeting
9/19-9/21/06	Miami	NAT/CAR WATRS Plus meeting FAA, CAR, NAT ATS providers, industry
9/18-9/21/06	Oslo	NAT ATMG (FAA to present working paper on the WATRS Plus plan)
11/6-10/06	Lisboa	NAT IMG
11/13-11/17/06	Rio de Janeiro	GREPECAS ATM/CNS Sub-group

Key Issues or Tasks

- Designation of RNP 10 as the minimum operator/aircraft navigation requirement
- ICAO documentation changes to support 50 nm lateral separation for RNP 10 approved aircraft
- Authorization process for operators/aircraft to meet RNP 10
- Major airspace redesign/harmonization effort with adjoining ATS providers--and supporting chart/ICAO ANP changes to reflect airspace redesign
- Accommodation of "small" percentage of flights not meeting the minimum navigation standard and/or discussion of ramifications for "exclusionary airspace"

Basic RNP 10 Operator/Aircraft Requirements

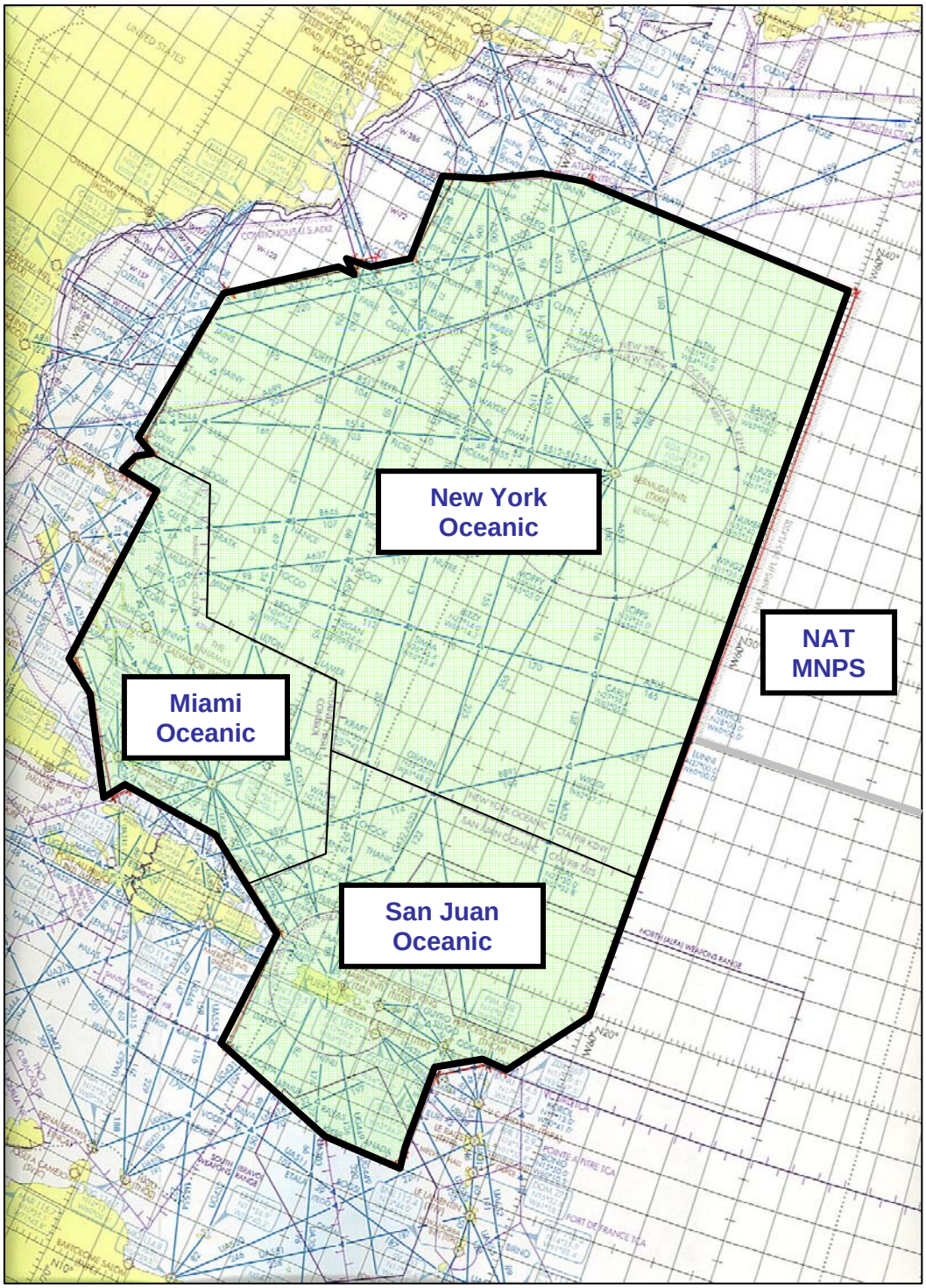
- ICAO Doc 9613 (Manual on RNP), Appendix E and FAA Order 8400.12A (RNP 10 Operational Approval) (as amended) provide authorization requirements.
- Two operational Long-Range Navigation Systems (LRNS) meeting RNP 10 standards required.
- RNP 10 time limit for INS & IRU systems. Approximate 6.0 hour time limit between position updates for aircraft on which INS or IRUs serve as the only LRNS, unless extended time limit approved.
    - Extended RNP 10 time limits of 10 hours & greater already approved for many IRU systems
    - Time limit may be issue for INS only equipped aircraft on westbound flights entering WATRS Plus airspace from Europe, Africa and the Mid-East.

Contacts

Ann Moore	OSRWG Chair & Oceanic Standards office (AJE-32)	Ann.Moore@faa.gov
Madison Walton	Flight Technologies & Procedures Div. (AFS-400)	Madison.Walton@faa.gov
Brian Colamosca	Separation Standards Analysis Group (AJP-7141)	Brian.Colamosca@faa.gov

WATRS Plus Airspace

- **WATRS Plus airspace being considered for oceanic lateral separation reduction.**
- **Chart only intended to show general location of WATRS Plus airspace.**
- **Full WATRS coordinates posted at www.faa.gov/ats/ato/watrs.htm**



APPENDIX B

Draft Concept of Operations

1. Vertical and horizontal boundaries of airspace

a. Horizontal Boundary. The coordinates defining the horizontal boundary of WATRS airspace are published in ICAO Doc 7030, NAT Supplementary Procedures and on the FAA's 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 on the WATRS Plus Webpage.

b. Vertical Boundary. WATRS Plus airspace extends from ground level 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. 50 nm Lateral Separation.

(1) WATRS Plus Airspace. 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) Transition airspace. 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. 90 nm Lateral Separation. 90 nm lateral separation will be applied whenever one or both aircraft in a pair are not approved for RNP 10.

c. Operator Filing Requirement. Operator/aircraft that are approved for RNP 10 (or better) that file a route of flight that falls with the WATRS Plus boundaries will file a flight plan equipment suffix that shows that authority. Operators will file the flight plan equipment suffix on their ICAO flight plan that correctly indicates their authorized navigation capability.

4. Provisions for accommodating aircraft not meeting RNP 10 or better

Aircraft that do not have authorization for RNP 10 or better may file into WATRS Plus airspace at any altitude. (FAA will do further work to validate this premise).

5. Aircraft Population RNP 10 Authorization Objective

a. Implementation Objective: Percentage of Flights Authorized RNP 10 or better. The WATRS Plus Task Force will progress its work with the objective of having approximately 85%? of **flights** in WATRS Plus airspace authorized for RNP 10 or better by one month prior to the project implementation date.

b. RNP 10 or Better Compliance to the Maximum Extent Possible. The WATRS Plus Task Force will advocate that all operators/aircraft that fly in WATRS Plus airspace obtain RNP 10 or better authorization.

6. Concept for use of Ocean 21

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 minimum lateral separation of 50 nm.

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

a. Transfer of Flights into NAT MNPS Airspace Where ATS is Provided by Other ATS Providers. Aircraft transiting FAA controlled airspace to NAT MNPS airspace where ATS is provided by other ATS providers will be transferred with 60 nm lateral separation applied.

b. Transfer to Other Oceanic FIRs. TBD

c. Transition airspace. TBD

9. Flight Plan Equipment Suffix Requirements: ICAO

a. ICAO Flight Plans. To inform ATC and to key Ocean21 automation that they have

RNP 10 or better authorization and are eligible for 50 nm separation, operators must annotate item 10 (Communication, Navigation and Approach Equipment) of the ICAO Flight Plan with the appropriate equipment suffix (e.g., letter "R").

Note: on the ICAO Flight Plan, letter "R" indicates that the aircraft will maintain the appropriate RNP type for the entire flight through airspace where the RNP type is applied. The ICAO Flight Plan Study Group is developing more specific information for future incorporation into Doc 4444, PANS/ATM.

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 authorization from the appropriate State authority.

b. Guidance To Be Used, 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. Implementation Decision Date: calendar date 3 months prior to target implementation date.

b. Operator/aircraft RNP 10 or better Authorization Date: AIRAC date 1 month prior to target implementation date.

c. Target Implementation Date: AIRAC date when new lateral separation standard and airspace redesign will be applied.

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APPENDIX C

Operational Approval for RNP 10

1. DOCUMENTS

A. ICAO Documents.

(1) ICAO Document 9613 (Manual On Required Navigation Performance (RNP)

- **Appendix E** – ICAO Guidance Material for the Development of an RNP 10 Operational Approval Process

(2) ICAO Performance Based Navigation (PBN) Manual (under development).
Draft Vol. II, Chapter 1 is "RNP 10 Operations".

B. FAA Documents

(1) **FAA Order 8400.12A** (Required Navigation Performance 10 (RNP 10) Operational Approval)

- Webpage: CNS Requirements/Options and Operational Policy in Pacific Oceanic Airspace, Section 2. (www.faa.gov/ats/ato/cns.htm)

(2) **FAA Order 8400.33** (Authorization for RNP-4 in Oceanic and Remote Area Operations): Section 3 of the webpage shown above.

(3) **Handbook Bulletin (HBAT 98-16A, HBGA 98-03A)** (1/5/99) (Approval of Aircraft and Operators for Flight in Airspace Where RNP 10 Is Applied)

(4) **Operations Specifications Paragraph: B036 (Class II Navigation Using Multiple Long-Range Navigation Systems (LRNS)).**

(5) **Part 91 Automated Letter of Authorization: LOA B036 (Operations in Required Navigation Performance Airspace)**

C. Australian Document: Civil Aviation Advisory Publication 35-1

2. Content of Application For RNP 10 Operational Approval

A. RNP 10 Aircraft Eligibility Group. Provide airworthiness documents that establish the aircraft/navigation system group being proposed, its RNP 10 approval status, and a list of airframes in that group.

B. Approved RNP 10 Time Limit For Aircraft Equipped Only With INS or IRU Systems. For aircraft where INSs or IRUs provide the only source of long range navigation, show approved RNP 10 Time Limit.

C. RNP 10 Area of Operations. Provide documentation that establishes the RNP 10 area of operations or tracks for which the specific aircraft/nav system is eligible.

-Show method and effect of aircraft position updating en-route.

-Conduct route evaluation in accordance with 8400.12, paragraph 15.

D. Operating Practices and Procedures. Provide documentation that operator has adopted operating practices and procedures related to RNP 10 operations.

E. Pilot and Dispatcher Training. Provide documentation that shows that pilot and, if applicable, dispatcher knowledge of RNP 10 operating practices and procedures will be adequate. (For part 121, 125 and 135: training programs updated).

F. Maintenance Practices and Procedures. Provide documentation that appropriate maintenance practices and procedures have been adopted.

G. Minimum Equipment List. Provide Minimum Equipment List (MEL) updates, if applicable.

H. Operating History. Provide operating history that identifies past problems and incidents, if any, and actions taken to correct the situation.

I. Follow-up Action After Navigation Error Reports and Potential For Removal of RNP 10 Operating Authority. Show awareness of the necessity for follow up action after navigation error reports and the potential for removal of RNP 10 operating authority.

3. Aircraft RNP 10 Eligibility Groups Provided For in FAA 8400.12A

A. Eligibility Group 1 – Aircraft Eligibility Through RNP Certification

- RNP compliance documented in the AFM. Typically not limited to RNP 10.
- Example: B747-400 or A-340 incorporating FANS 1/A.

B. Eligibility Group 2 – Eligibility Though Prior Navigation System Certification.

(1) Dual INS or IRU approved in accordance with **Part 121, Appendix G** (6.2 hour RNP 10 time limit, unless action taken to extend time)

(2) Dual INS or IRU **approved for NAT MNPS or Australian RNAV operations**….eligible for RNP 10 with 6.2 hour RNP 10 time limit unless action taken to extend time.

(3) Dual GPS approved for **primary means of navigation in oceanic and remote areas**….approved in accordance with **AC 20-138 (as amended)** (34-minute limit on FDE unavailability)

- GPS/WAAS systems installed in accordance with AC-20-138A incorporate primary means capability. TSO-C145a and TSO-C146a are applicable.

(4) Multi-sensor systems integrating GPS (GPS integrity provided by RAIM or Aircraft Autonomous Integrity Monitoring (AAIM))….approved in accordance with **AC 20-130A.**

(5) Single INS or IRU and single **TSO C-129 authorized GPS with approved FDE and exclusion** (34-minute FDE unavailable time)

C. <u>Eligibility Group 3</u> – Aircraft Eligibility Through Data Collection

(1) **Appendix 1 (Sequential Method).** Uses Pass/Fail graphs to assess INS or IRU performance and RNP 10 time limit.

(2) **Appendix 6 (Periodic Method).** Allows use of hand-held GPS to assess INS or IRU performance and RNP 10 time limit.

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APPENDIX D

DRAFT SUMMARY OF FAA MAJOR TASKS AND DOCUMENT UPDATES

WATRS PLUS AIRSPACE REDESIGN & SEPARATION REDUCTION

MAJOR TASKS TO BE ACCOMPLISHED BEFORE IMPLEMENTATION	STATUS/REMARKS
1. Operating concept…..established	
2. Rulemaking requirements…… assessed	
3. Aircraft/Operator authorization requirements/documents……published and coordinated with other civil aviation authorities and with operators (equipage, performance, authorization)	
4. Airspace Analysis and Re-design……completed, as required	
5. ATC simulations, if required……completed	
6. ATC automation systems and programs…..addressed (e.g., ERAM, URET, DOTS)	
7. Ocean 21 modification requirements……assessed	
8. Operator information and education programs……completed (seminars, website,etc.)	
9. Coordination with Adjoining ATS Providers……completed	
10. Coordination with other State regulators and ICAO groups……completed	
11. Flight Standards documents……published	
12. Air Traffic documents……published	
13. ICAO documents……published	
14. Flight Standards Field Offices/inspectors……ready	
15. Air Traffic Centers……ready **a. Oceanic 21**……modified, if required **b. Air Traffic Controllers**……trained **c. Resectorization**…..addressed, as necessary	
16. Operator/Aircraft Fleet……ready: TBD% (85-90%?) of flights authorized	
17. Safety Analysis……completed	

DOCUMENT DEVELOPMENT OR REVISION REQUIREMENTS

	STATUS/REMARKS
ICAO Documents 1. Submission for Revision to Regional Supplementary Procedures (ICAO Doc 7030) (includes safety analysis) a. North Atlantic Region b. Caribbean Region 2. Submission for CAR/SAM Air Navigation Plan (ICAO Doc 8733) Volumes I and II ATS Route Networks	
Air Traffic Documents 1. FAA Order 7110.65, Chapter 8, Section 7, 8-7-4 (Lateral Separation) 2. Advance Notice (NOTAM): planned implementation date, aircraft/operator requirements and operating concept 3. Operational policies and procedures Notice 4. Advance Notice (Declaration of decision to implement)	
Flight Standards Documents 1. Update FAA Order 8400.12A (RNP 10 Operational Approval) 2. Update FAA General Aviation Operations Inspector's Handbook 3. Update FAA Air Transportation Operations Inspector's Handbook	
Separation Standards Analysis Group Documents 1. Safety analysis for Doc 7030 submission(s) 2. Pre-implementation Safety Assessment	

Industry Organization Coordination/Information

AEA, AOPA, ATA, Cargo Airline Assoc., IATA, U.S. Pilot Assoc.: ALPA, APA, CAPA, IPA, SWAPA;

IFALPA, IFATCA, NACA, NATA, NBAA, IBAC, GAMA, RAA, DOD, JEPPESSEN, ARINC

ICAO Organization Coordination

NAT/SPG, GREPECAS, ICAO Paris and Mexico City

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