

PERFORMANCE BASED FLIGHT SYSTEMS BRANCH

B036, Oceanic and Remote Continental Navigation using
Multiple Long-Range Navigation Systems (M-LRNS)

or

B054, Oceanic and Remote Airspace Navigation using a
Single Long-Range Navigation System (S-LRNS)



Oceanic and Remote Continental Navigation Compliance Guide



PERFORMANCE BASED
FLIGHT SYSTEMS BRANCH



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Document Changes

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Contents

Document Changes	iii
Section 1: Introduction	1
Terms and Symbols	1
B036 Authorization	1
B054 Authorization	2
Instructions	2
Table 1: Summary of Operations and Required Operations Specifications	3
Table 2: Titles of OpSpecs/MSpecs/LOAs used in Table 1	4
Naming Convention	5
Application Information	6
Aircraft/Fleet and Navigation Equipage	7
Communication	7
Navigation	7
Areas/Routes of Operation	8
Table 3: Sample Authorization Table – Authorized Airplane(s), Equipment	9
Section 2: Aircraft Eligibility Attachments	10
Statement of Compliance (SOC)	10
Equipage:	10
Equipage Continued	11
Section 3: Operational Requirements	13
Operational Procedures	13
Operational Procedures Continued	14
Operational Procedures Continued	15
MEL	15
Flight Plans	15
Training	16
Navigation Database (NDB)	16
Section 4: Additional Information	17
Additional PI Requested Documentation	17
Document Review	17

Appendix B: Definitions and Acronyms 18
Definitions18
Acronyms21



Section 1: Introduction

This compliance guide was developed by the Federal Aviation Administration (FAA) [Flight Technologies and Procedures Division](#) to provide operators with an organized method for submitting required content for a B036 or B054 Operations Specification (OpSpec)/Management Specification (MSpec)/Letter of Authorization (LOA). Use of this guide is optional, but when used, expedites the application process because it condenses into one location the information required for oceanic and remote continental operations. Operators adhering to this guidance by supplying the requested documentation will significantly reduce the application processing time. This document may be used for the following:

1. New B036 or B054 application
2. Operators with a current B036 or B054 adding aircraft that are not identically equipped as their original authorization. In such cases, complete a separate compliance guide for each aircraft that differs from your original aircraft and include [Section 2](#).
3. Upgrading RNP capability of a current B036 authorization (i.e. upgrading from RNP 10 to RNP 4 or RNP 2 due to a change in aircraft equipage).

For new applications, operators should schedule a pre-application meeting or teleconference with your Flight Standards Office (FS).

Terms and Symbols

Principal Inspector (PI): This document uses the term “Principal Inspector (PI)” which may be a Principal Operations Inspector (POI), Principal Avionics Inspector (PAI) or Principal Maintenance Inspector (PMI).

Operator: An “operator” refers to an operator, certificate holder, program manager, and operator/company.

Flight Management Computer (FMC): By definition, a Long Range Navigation System (LRNS) includes an electronic navigation unit that computes for the pilots steering commands to fly the intended route of flight. In many transport aircraft, the electronic navigation unit is the flight management computer (FMC), the term used throughout in this document. Your aircraft may refer to the electronic navigation unit by a different term.

Current AC: The current AC is indicated by “()” in place of the version letter. For example AC 90-105A will be shown in this guide as AC 90-105().

We appreciate any feedback to improve this compliance guide.

Contact the Performance Based Flight Systems Branch by calling: (202) 267-8847

B036 Authorization

B036 serves a dual purpose; it authorizes operations in oceanic and remote continental airspace; and authorizes Required Navigation Performance (RNP) 2, RNP 4 or RNP 10 navigation performance specifications. An operator receives a B036 based on their aircraft’s RNP capability and after demonstrating their overall competence for oceanic and remote continental operations. RNP 4 and RNP 10 are strictly oceanic and remote continental navigation specifications. RNP 2 has both a “domestic” application and an oceanic/remote continental applica-



tion. While B036 authorizes IFR en route operations in oceanic and remote continental airspace on a worldwide basis, other authorizations may be needed. For example, Part 121, 125, 135 and 91K operators will need to apply for B037 and B038 to operate in Central Eastern Pacific (CEP) or North Pacific (NOPAC) airspace. See [Table 1](#) and [Table 2](#) for additional authorizations that you may require depending on your operation. As part of the bundling concept described in [AC 90-105\(\)](#), B036 includes advanced RNP (A-RNP) which is defined in the United States as having the operational and functional capability of performing scalability, radius to fix (RF), and parallel offset.

Guidance Documents for B036 Operations

Refer to the following suggested guidance for oceanic and remote continental operations:

- [AC 91-70\(\)](#), *Oceanic and Remote Continental Airspace Operations*. This document provides detailed guidance for operators planning flights in oceanic and remote continental airspace. As true for all ACs, AC 91-70 is not mandatory but does contain internationally accepted best practices. You may choose something other than AC 91-70 as a source of guidance, but your inspector will expect your procedures and training to cover the subject matter of this AC.
- [AC 90-105\(\)](#), *Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System and in Oceanic and Remote Continental Airspace*. This AC is the primary source of guidance on aircraft qualification, operating procedures and pilot training/knowledge on RNP operations. It provides the aircraft eligibility requirements for RNP 2, 4 and 10. The level of detail on aircraft requirements provided in AC 90-105 is primarily for aircraft manufacturers but you may be required to provide Original Equipment Manufacturer (OEM) statements from your Airplane Flight Manual (AFM) and other document to verify aircraft eligibility.
- [AC 20-138\(\)](#), *Airworthiness Approval of Positioning and Navigation Systems*. As stated by the title, this is primarily manufacturer guidance for airworthiness of position and navigation systems.

B054 Authorization

B054 authorizes oceanic and remote continental airspace navigation using a navigation specification of RNP 10 in airplanes equipped with a single long-range navigation system (SLRNS). Operators must have been issued OpSpec/MSpec/LOA B036 or OpSpec/MSpec/LOA B054 in order to be considered for B039 for operations in North Atlantic High Level Airspace.

Instructions

1. All applications should use the fill-in-the-blank portion of this guide (pages 6-9).
2. If adding aircraft to an existing B036 or B054 authorization that are not identically equipped, then fill out a separate application for each aircraft or fleet and include [Section 2](#).
3. [Table 1](#) provides a reference of other OpSpecs/MSpecs/LOAs that may also may be needed in conjunction with the B036 or B054 authorization.
4. With each attachment, include the corresponding reference number (e.g. SOC-1) next to each excerpt (screen shot or copied text) and include the document title, page number and paragraph number. If an item is not applicable, provide a brief explanation as to why it does not apply.



5. At completion of this guide, there should be two documents:
 1. Oceanic and Remote Continental Compliance Guide, and
 2. Request letter, and attachments in a MS Word file converted to a .pdf file.

Place your request letter and attachments in a single Microsoft Word (MS) file with any screen captures or direct wording from applicable manuals and then convert the MS Word file using the “Save as” function to a PDF format. Use the naming convention described on [page 5](#) of this guide to name your file(s). If possible, submit your application and attachments in a single PDF format by combining PDF files (e.g. using the combine files feature of Adobe Acrobat). If you do not have the ability to combine the two PDF files, then submit this guide and your attachment file as two PDF documents using the naming conventions on [page 5](#). The use of highlights, outlines, tables and/or hyper-links for your supporting documentation (attachments) aids in reducing the application process time.

6. For the attachments, please include **only the applicable page or paragraph to show compliance**. Attaching irrelevant documentation other than the requested page/paragraph to show compliance, only delays the application process.

Table 1: Summary of Operations and Required Operations Specifications

Operation	Part 91 LOA	Part 91K MSpec	Part 121 OpSpec	Part 125 OpSpec	Part 135 OpSpec	Guidance Remarks
CPDLC	A056	A056	A056	A056	A056	AC 90-117() , Data Link Communication Compliance Guide, NAT OPS Bulletin 2018 002
ADS-C	A056	A056	A056	A056	A056	AC 90-117()
PBCS	A056	A056	A056	A056	A056	AC 90-117()
RNP 2	B036	B036	B036	B036	B036	
RNP 4	B036	B036	B036	B036	B036	B036 NAT OPS Bulletin 2017 002 Rev 01, NAT OPS Bulletin 2017 005
RNP 10	B036	B036	B036	B036	B036	See above notes.
Central East Pacific (CEP)	B036	B036 B037	B036 B037	B036 B037	B036 B037	AC 91-70() AC 90-105()
North Pacific (NOPAC)	B036	B036 B038	B036 B038	B036 B038	B036 B038	AC 91-70() AC 90-105()
NAT High Level Airspace (HLA)	B036 or B054 B039	B036 or B054 B039	B036 or B054 B039	B036 or B054 B039	B036 or B054 B039	AC 90-105() AC 91-70() ICAO Doc 4444, Doc 7030 NAT OPS Bulletins NAT Doc 007
Areas of Magnetic Unreliability (AMU)	B036	B036 B040	B036 B040	B036 B040	B036 B040	AC 91-70()



Operation	Part 91 LOA	Part 91K MSpec	Part 121 OpSpec	Part 125 OpSpec	Part 135 OpSpec	Guidance Remarks
ETOPS			B342 B344		B342 B344	Part 121, § 121.161. Part 135, §135.364 Part 135, Appendix G AC 120-42() AC 135-42 ()
RVSM	B046 D092	B046 D092	B046 D092	B046 D092	B046 D092	AC 91-85()
Authorized Areas of En Route Operations, Limitations, and Provisions		B050	B050	B050	B050	
North Polar Operations		B055	B055 B342 B344	B055	B055	Part 135, § 135.98 Part 121, § 121.7 (defines Polar area) Part 121 § 121.99 AC 91-70() AC 120-42() AC 135-42 ()
Canadian MNPS					B059	

Table 2: Titles of OpSpecs/MSpecs/LOAs used in Table 1

Designation	Title
A056	Data Link Communications
B036	Oceanic and Remote Continental Navigation using Multiple Long-Range Navigation Systems (M-LRNS)
B037	Operations in Central East Pacific (CEP) Airspace
B038	North Pacific (NOPAC) Operations
B039	Operations in North Atlantic High Level Airspace
B040	Operations in Areas of Magnetic Unreliability
B041	North Atlantic Operation (NAT/OPS) with Two-Engine Airplanes Under Part 121
B046	Operations in Reduced Vertical Separation Minimum (RVSM) Airspace
B050	Authorized Areas of En Route Operations, Limitations, and Provisions
B054	Oceanic and Remote Airspace Navigation Using a Single Long-Range Navigation System
B055	North Polar Operations
B059	Canadian MNPS (C-MNPS)
B342	Extended Operations with Two-Engine Airplanes under Part 121 or 135
B344	Extended Operations in Passenger-Carrying Airplanes with More than Two Engines, Under Parts 121 or 135
D92	Airplanes Authorized for Operations in Designated Reduced Vertical Separation Minimum Airspace



Naming Convention

Use the following file naming convention when submitting this document as a B036 or B054 application. The following examples are for a B036 application and attachments:

B036_Application_Company/Name_Date(XX_XX_XXXX)_Version_Number_(VX)

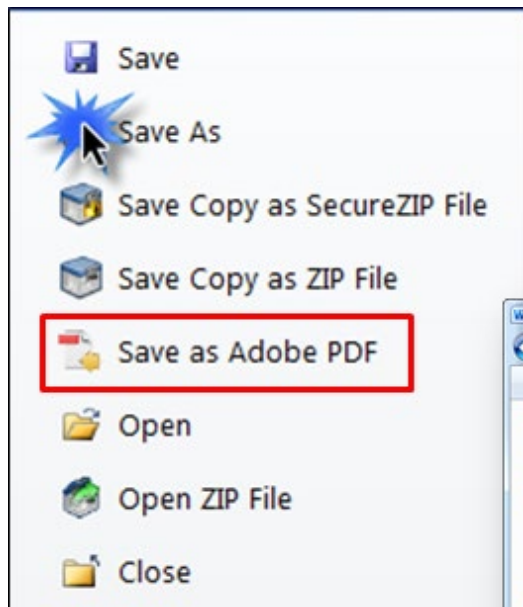
Example: B036_Application_ABCAirlines_02_29_2016_V2

Use the following file naming convention when submitting your attachments.

B036_Attachments_Company/Name_Date(XX_XX_XXXX)_Version_Number_(VX)

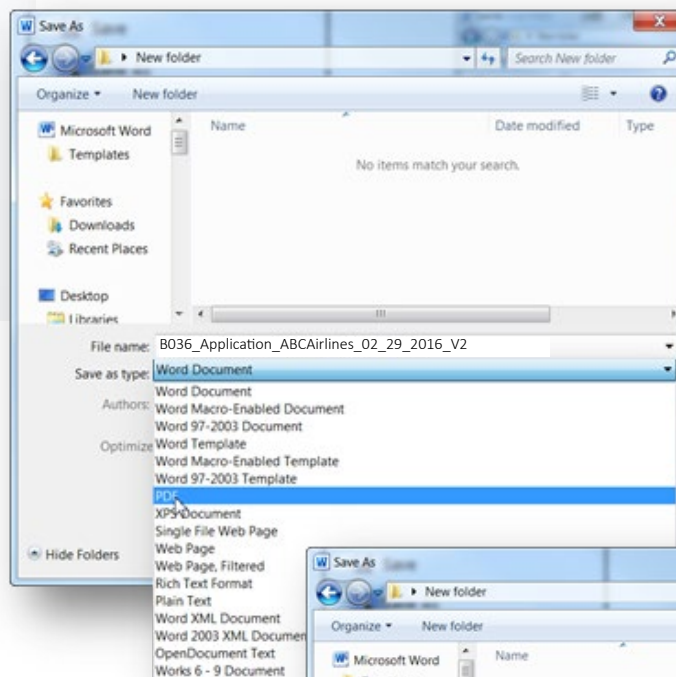
Example: B036_Attachments_ABCAirlines_02_29_2016_V2

Note: Version numbers are used in order for the PI to distinguish between a re-submittal of an application and the original which should be labeled beginning with V1.



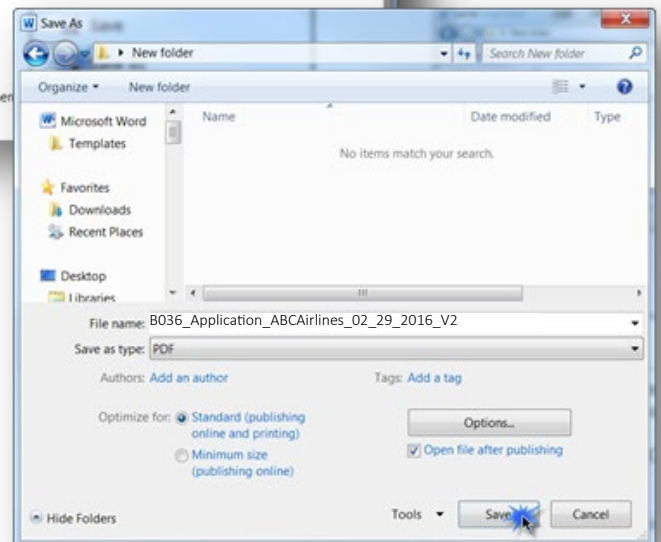
Step 1:

In MS Word, select “Save As” under File Menu or select “Save as Adobe PDF” and skip Step 2



Step 2:

Select “PDF” under “Save as type”



Step 3: Saving file with naming convention.

Use the following naming convention with underlines “_” as shown:

B036_Application_Your_Company/Name_Date_Version

Example:

B036_Application_ABCAirlines_02_29_2016_V2



Application Information

Type of Application and Request Letter:

B036 application

Upgrading RNP capability to an existing B036 authorization.

B054 application

Adding non-identically equipped aircraft to an existing B036 OpSpec/MSpec/LOA (include Section 2)

Adding non-identically equipped aircraft to an existing B054 OpSpec/MSpec/LOA (include Section 2)

Letter of Request attached.

Contact Information:

Company/Operator Name:

FAA Location Designation:

14 CFR Part:

Address:

Suite:

City:

State:

Zip Code:

Responsible person for oceanic and remote continental operations

Contact Name:

Contact Phone:

Contact Email:

FAA POI:

Principal Inspector (PI) First Name:

Principal Inspector (PI) Last Name:

PI Email Address:

PI Phone:

Description of Operations:

Briefly describe your operation as it relates to oceanic and remote continental airspace. Include any other possible Operation Specifications/Management Specifications/Letter of Authorizations that you intend to obtain.



Aircraft/Fleet and Navigation Equipage

B036 requires a minimum of two LRNS. It is important to emphasize here that a single FMC receiving navigational inputs from two or more independent sources (e.g. GPS, inertial system) is considered only a single LRNS. For RNP 2, you must have at least two LRNS with each system receiving a GNSS source. For RNP 4, at least one of the two LRNS must have a GNSS source. For RNP 10, both LRNS may have any combination of GNSS and inertial sources. Though not a part of the B036 or B054 authorization, the aircraft’s communication systems must be adequate for overwater operations.

Aircraft Registration and Serial Number(s)

Make:

Model:

Series:

Communication

In accordance with Part 91, §[91.511](#), Part 121, §[121.351](#), and Part 135, §[135.165](#), your aircraft must have two-way radio communication that is adequate for overwater operations in order to comply with 14 CFR Part 91, §91.83.

Does your aircraft have a long-range communication system(s)? Yes No

Number of installed HF radios:

Number of installed SATVOICE radios: *(installed in compliance with [AC 20-150\(\)](#))*

CPDLC capability: Yes No

ADS-C capability: Yes No

FANS 1/A+ latency timer: Yes No

Navigation

Lowest RNP Value for Oceanic and Remote Continental Operations *(as per SOC-1, see [page 7](#)):*

RNP 2: **RNP 4:** **RNP 10:**

Long Range Navigation Systems (LRNS) Number installed:

FMC Make:

FMC Model:

FMC Make:

FMC Model:

FMC Make:

FMC Model:



Long Range Navigation Systems:

GNSS System(s)

GNSS Make:

Number Installed:

GNSS Model:

Inertial Navigation System(s)

ADIRU/IRU/INS Make:

Number Installed:

ADIRU/IRU/INS Model:

Time Limit:

Areas/Routes of Operation

(Applicable for Parts 91K, 121, 135, and 125)

I have OpSpec/MSpec/LOA B050

I do not have OpSpec/MSpec/LOA B050

Applying for B050 with B036

Specific B050 areas and routes
of operation:

Specific areas and routes of intended
operation:



Table 3: Sample Authorization Table – Authorized Airplane(s), Equipment

Table 3 is a representation of the actual B036 Opspec/MSpec/LOA authorization. B036 uses “bundling” which is a hierarchy of navigation capabilities starting with the most stringent and combining it with lesser capabilities. For example, if your aircraft is capable of A-RNP and RNP 4 then you would also be authorized for A-RNP, RNP 4 and RNP 10. RNP 2 may be issued but is not currently in use for oceanic operations. For a B054 application, use the table below and select RNP 10 for the navigation specification.

Airplane M/M/S	Long-Range Navigation Systems (LRNS)			Navigation Specification(s)	Additional Capabilities	Limitations	RNP Time Limits
	Manufacturer	Model/HW Part #	Software Part/ Ver #				



Section

2

Section 2: Aircraft Eligibility Attachments

For each attachment, provide the necessary page(s)/paragraph(s) to establish compliance. Include the corresponding reference numbers with each attachment in a separate MS Word document which is to be converted to a PDF format. Specific airworthiness guidance is provided in [AC 20-138\(\)](#).

Statement of Compliance (SOC)

Check Box	Reference Number	SOC Attachments
<input type="checkbox"/>	SOC-1	<p>Attach a page/paragraph showing a Statement of Compliance (SOC) with criteria of the lowest RNP capability of your aircraft in Advisory Circular (AC 20-138()), Airworthiness Approval of Positioning and Navigation Systems. The SOC may be in your Airplane Flight Manual (AFM), Airplane Flight Manual Supplement (AFMS), pilot’s operating handbook (POH), or avionics operating manual. This SOC may be provided from the manufacturer, the entity that owns the design approval for the installed navigation systems or an alternative authority approved by the FAA.</p> <p>Note: If your AFM does not provide an SOC, you must coordinate with the aircraft manufacturer to obtain the necessary documentation.</p> <p><i>Source: AC 90-105(), Appendices: E,F, and G, paragraphs: E.2.1, F.2.1, G.2.1</i></p>

Equipage:

Check Box	Reference Number	Equipage Attachments
<input type="checkbox"/>	EQP-1	<p>Provide documentation to establish you have maintenance procedures for all LRNS intended for use in oceanic and remote continental operations.</p> <p><i>Source: AC 90-105(), Appendices: E and F, paragraphs E.5.1 and F.5.1</i></p>



Equipage Continued

Check Box	Reference Number	Equipage Attachments
	EQP-2	<p>RNP 2:</p> <p>If you are applying for RNP 2, then provide documentation that your aircraft has at least two fully serviceable independent GNSS LRNS, with integrity such that the navigation system does not provide misleading information. These systems must be installed in accordance with AC 20-138().</p> <p><i>Source: AC 90-105(), paragraph E.3</i></p>
	EQP-3	<p>RNP 4:</p> <p>If you are applying for RNP 4, then provide documentation that your aircraft has at least two serviceable independent long-range navigation systems (LRNS). Global Navigation Satellite System (GNSS) must be used as either a stand-alone navigation system, as one of the sensors in a multisensor system, or as part of an integrated GNSS/inertial system. These systems must be installed in accordance with AC 20-138().</p> <p>Note: Not applicable for B054.</p> <p><i>Source: AC 90-105(), paragraph F.2</i></p>
	EQP-4	<p>RNP 10:</p> <p>B036</p> <p>Provide documentation that your aircraft has at least two approved serviceable independent LRNS receiving inputs from GNSS or inertial navigation sources.</p> <p><i>Source: AC 90-105(), paragraph G.2-G.7</i></p> <p>B054</p> <p>Provide documentation that your aircraft has one approved independent serviceable LRNS receiving inputs from GNSS or inertial navigation sources.</p> <p>All navigation systems must be installed in accordance with AC 20-138().</p>
	EQP-5	<p>As defined by AC 90-105(), advanced RNP (A-RNP) is the operational and functional capability of performing:</p> <ol style="list-style-type: none"> 1. Scalability, 2. Radius to Fix (RF), and 3. Parallel offset. <p>If your AFM or other OEM documentation includes all these capabilities, provide the excerpt(s) from those documents. If your aircraft is not capable of all from the above list, then enter N/A for this attachment reference number.</p> <p><i>Source: AC 90-105(), Appendix H, paragraph H.3</i></p>

A I R C R A F T E L I G I B I L I T Y



Check Box	Reference Number	Equipage Attachments
	EQP-6	<p>Provide documentation if your aircraft has any of the following additional capabilities:</p> <ul style="list-style-type: none"> • Fixed Radius Transition (FRT) and/or • Time of Arrival Control (TOAC) <p>Note: These capabilities are not currently used in United States domestic air-space but may be utilized internationally.</p> <p><i>Source: AC 90-105(), Appendix H, paragraph H.3</i></p>



Section
3

Section 3: Operational Requirements

For each attachment, provide the necessary page(s)/paragraph(s) to establish compliance. Include the corresponding reference numbers with each attachment.

This section includes the minimum operational requirements in the following areas:

1. Operational Procedures
2. Master Minimum Equipment List/Minimum Equipment List (MMEL/MEL)
3. Flight Plans
4. Training

Operational Procedures

Established policies and procedures for pilots and operational staff involved in oceanic and remote continental operations as per [AC 91-70\(\)](#) and [AC 90-105\(\)](#) as applicable

Check Box	Reference Number	Operational Attachments
	OPS-1	Attach operational procedures for verifying the RNP value set in the FMS matches the equipment capability and authorizations as annotated in the ATC flight plan prior to entering oceanic and remote continental airspace. <i>Source: AC 90-105(), Appendices: E, F, and G, paragraphs: E.9.5.5, F.8.3.5, and G.11.3.5</i>
	OPS-2	Provide excerpts of established operating procedures for the RNP system and how those procedures are controlled. Include flight manual checklist(s) for LRNS operation. <i>Source: AC 90-105(), Chapter 7, paragraph 7.5.1., Item 2 and 3</i>
	OPS-3	If your aircraft is equipped with Global Navigation Satellite System (GNSS) only systems, provide documentation of an approved GNSS availability prediction program ensuring the requisite availability of the GNSS Fault Detection and Exclusion (FDE) function. <i>Source: AC 90-105(), Appendices: E, F, and G, paragraphs L E.8.2.1, F.4.3.1 and G.7.1</i>



Operational Procedures Continued

Check Box	Reference Number	Operational Attachments
	OPS-4	<p>Provide documentation of pilot procedures for the manual entry of waypoints (i.e., latitude and longitude) for <u>flexible route structures</u> if applicable to your operation. Include documentation of how such manually entered points are displayed on the navigation display and in the FMS (i.e., how they are labeled/named).</p> <p><i>Source: AC 90-105(), Appendices: E, F, and G, paragraphs: E.9.5, F.8.3, and G.11.3.1</i></p>
	OPS-5	<p>Provide documentation of LRNS preflight procedures and included pilot procedures to confirm the correct route is loaded.</p> <p><i>Source: AC 91-105(), Appendix F and G, paragraph: F.8.3.1 and G.11.3.2; AC 91.70(), Chapter 6, paragraph 6.3, Chapter 7, paragraph 7.4.2</i></p>
	OPS-6	<p>Provide documentation of pilot cross-checking procedures to identify navigation errors in sufficient time to prevent an inadvertent deviation from ATC-cleared routes. Your procedures should include cross-checking aircraft position at a point approximately 10 minutes after oceanic waypoint passage using one of the following methods:</p> <ul style="list-style-type: none"> • Manually plotting on a chart or • Use of aircraft FMS-driven navigation displays and indications <p><i>Source: AC 91-105(), Appendices E and F, paragraphs: E.9.5.6 and F.8.3.5, ; AC 91.70(), Chapter 6, paragraph 6.4.8.2</i></p>
	OPS-7	<p>Provide your checklist used for oceanic operations.</p> <p><i>Source: AC 91-70(), Appendix D</i></p>
	OPS-8	<p>Provide documentation of emergency and contingency procedures. These procedures may be due to:</p> <ul style="list-style-type: none"> • Inability to comply with assigned clearance due to meteorological conditions, aircraft performance, or pressurization failure. • En route diversion across the prevailing traffic flow. • Loss of, or significant reduction in, the required navigation capability when operating in airspace where the navigation performance accuracy is a prerequisite to the safe conduct of flight operations. <p>Include procedures for performing turn back and diversion procedures.</p> <p><i>Source: AC 91-70(), Appendix F</i></p>
	OPS-9	<p>Provide documentation on operational procedures for performing Strategic Lateral Offset Procedure (SLOP)</p> <p><i>Source: AC 90-105(), Appendices: E, F, and G: paragraph E.9.5.8 and F.8.3.8; AC 91-70(), paragraph 6.4.3.4.2</i></p>



Operational Procedures Continued

Check Box	Reference Number	Operational Attachments
	OPS-10	For multi-sensor systems, provide documented pilot procedures to verify the correct sensor is being used for position computation. <i>Source: AC 90-105(), Appendices: E, F, and G, paragraphs: E.9.6, F.8.3.11, and G.11.3.10</i>

MEL

Check Box	Reference Number	MEL Attachment
	MEL-1	If an MEL is required, provide documentation of your Minimum Equipment List (MEL) to address any revisions necessary for RNP flight operations. <i>Source: 91.213, AC 90-105(), Chapter 8, paragraph 8.3, Appendix E and F, paragraph E.8.2 and F.7.2.2</i>

Flight Plans

Check Box	Reference Number	Flight Plan Attachment
	FLP-1	Demonstrate the appropriate use of flight plan designators by completing a sample flight plan of an oceanic crossing. Include a sample Master Document/crew flight plan/computer flight plan (CFP)/operational flight plan (OFP). Below are resources to aid in your flight planning: <ul style="list-style-type: none"> • AC 91-70() (addresses Master Document) • FAA Form 7233-4 • Appendix A of this guide • FAA Flight Planning Information



Training

Check Box	Reference Number	Training Attachment
	TNG-1	<p>If you are under Part 91K, 121, 125, and/or 135, provide documentation that your training program addresses the operational practices in oceanic and remote continental operations. Training must include long-range navigation (LRN) equipment and procedures as part of the overall training program (e.g., initial, upgrade, or recurrent training for pilots, operational control personnel, and maintenance personnel). Training curricula should be in accordance with AC 90-105() and AC 91-70().</p> <p><i>Source: AC 90-105(), Chapter 8, paragraphs 8.2.2 and 8.4; AC 91-70(), Chapter 3, paragraph 3.2</i></p>
	TNG-2	<p>Part 91 Operators. Provide documentation (e.g. training completion certificate/record of completed training) that includes oceanic and remote continental operations and the use of long-range navigation (LRN) equipment and procedures.</p> <p>Note: Operators who hire contract pilots must provide your process of verifying acceptable training for oceanic and remote continental operations and the use of long-range navigation (LRN) equipment and procedures in accordance with LOA B036 or LOA B054 as appropriate.</p> <p><i>Source: AC 90-105(), Chapter 8, paragraph 8.2.1; AC 91-70(), Chapter 3, paragraph 3.2</i></p>

Navigation Database (NDB)

Check Box	Reference Number	NDB Attachment
	NDB-1	<p>Provide documentation to ensure your navigation database supplier possesses a Type 2 Letter of Acceptance (LOA) in accordance with AC 20-153(), Acceptance of Aeronautical Data Processes and Associated Databases.</p> <p><i>Source: AC 90-105(), Chapter 10, paragraph 10.1</i></p>
	NDB-2	<p>For Parts 91K, 121, 125, 129, and 135, provide documentation of your established database program that addresses the following:</p> <ul style="list-style-type: none"> • Identification of the responsible manager for the data updating process, • Process for accepting and verifying applicability, • Configuration control for your document data process, • Pilot procedures to confirm at system initialization that the navigation database is current • Procedures for reporting discrepancies that invalidate a procedure (e.g., database errors) to the navigation database supplier along with procedures to prohibit the use of an invalid procedure. <p><i>Source: AC 90-105(), Chapter 10, paragraph 10.7</i></p>



Section 4: Additional Information

Additional PI Requested Documentation

This section is included for any additional information that may be requested by your Principal Inspector (PI). For each attachment, provide the necessary page(s)/paragraph(s) to establish compliance. Include the corresponding reference number with the attachment.

Check Box	Reference Number	Additional PI Requested Documentation
	POI-1	If requested, attach additional documentation requested by your PI.

Document Review

Check each document below to indicate you are knowledgeable with each.

Check Box	Reference Number	Document List
	DOC-1	AC 90-105() , Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System and in Oceanic and Remote Continental Airspace
	DOC-2	AC 20-138() , Airworthiness Approval of Positioning and Navigation Systems.
	DOC-3	AC 91-70() , Oceanic and Remote Continental Airspace Operations
	DOC-4	Aeronautical Information Manual (AIM) , Part 2 En Route, Oceanic Operations.
	DOC-5	Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869), ICAO.
	DOC-6	State Aeronautical Information Publications (AIP). (U.S. Link) See Order 8900.1 Volume 4, Chapter 12 Section 1
	DOC-7	State Notices to Airmen (NOTAM). (U.S. Link)
	DOC-8	FAA chart supplements , Oceanic Errors Safety Bulletin (OESB) (NAT OPS Bulletins).



Appendix B: Definitions and Acronyms

Definitions

A

Air Traffic Control (ATC) Service:

1. Area Control Service,
2. Approach Control Service, and
3. Airport Control Service.

Area Navigation (RNAV). A method of navigation which permits aircraft operation on any desired flightpath within the coverage of ground or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these. RNAV includes Performance-based Navigation (PBN) as well as other operations that do not meet the definition of PBN.

Area Navigation (RNAV) System. A navigation system which permits aircraft operation on any desired flightpath within the coverage of ground or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these. A RNAV system may be included as part of a flight management system (FMS).

D

Distance Measuring Equipment (DME) DME/DME (D/D) RNAV. Refers to navigation using DME ranging from at least two DME facilities to determine position.

DME/DME/Inertial (D/D/I) RNAV. Refers to navigation using DME ranging from at least two DME facilities to determine position along with use of inertial systems, inertial reference system (IRS) or Inertial Reference Unit (IRU), to provide sufficient position information during limited DME gaps.

F

Fault Detection and Exclusion (FDE). A RAIM algorithm that can automatically detect and exclude a faulty satellite from the position solution when a sufficient number of redundant satellite measurements are available.

Fixed Radius Transition (FRT). An arc at a constant (specified) radius that is tangent to both the inbound and outbound en route path segments at an en route fix.

Flight Management System (FMS). An integrated system, consisting of airborne sensor, receiver and computer with both navigation and aircraft performance databases, which provides performance and area navigation guidance to a display and automatic flight control system (AFCS).

Flight Technical Error (FTE) or Path Steering Error (PSE). Accuracy with which an aircraft is controlled, as measured by the indicated aircraft position with respect to the indicated command or desired position. It does not account for procedural blunder errors.



G

Global Navigation Satellite System (GNSS). GNSS is a generic term for a worldwide position, velocity, and time determination system, which includes one or more satellite constellations, aircraft receivers, and system integrity monitoring. GNSS includes GPS, Satellite-based Augmentation Systems (SBAS) such as the wide area augmentation system (WAAS), Ground Based Augmentation System (GBAS). Global Orbiting Navigation Satellite System (GLONASS), Galileo, and any other satellite navigation system approved for civil use. GNSS can be augmented as necessary to support the Required Navigation Performance (RNP) for the actual phase of operation.

Global Positioning System (GPS). GPS is a U.S. satellite-based radio navigation system that provides a positioning service anywhere in the world. The service provided by GPS for civil use is defined in the GPS Standard Positioning System Signal Specification. GPS is the U.S. core GNSS satellite constellation providing space-based positioning, velocity, and time. GPS is composed of space, control, and user elements.

L

Long-Range Navigation System (LRNS). An electronic navigation unit that is approved for use under instrument flight rules (IFR) as a primary means of navigation, and has at least one source of navigational input, such as inertial navigation system (INS) and/or GPS.

N

Navigation Specification (Nav Spec). A set of aircraft and aircrew requirements needed to support PBN operations within a defined airspace. There are two kinds of Nav Spec:

1. RNAV specification. A Nav Spec based on RNAV that does not include the requirement for onboard performance monitoring and alerting, designated by the prefix RNAV (e.g., RNAV 5, RNAV 1).
2. RNP specification. A Nav Spec based on RNAV that includes the requirement for onboard performance monitoring and alerting, designated by the prefix RNP (e.g., RNP 4, RNP APCH).

Navigation System Error (NSE). NSE or Position Estimation Error (PEE) is the difference between the true position and estimated position.

O

Oceanic. Oceanic airspace is defined as international airspace over oceans where separation and procedures are in accordance with the International Civil Aviation Organization (ICAO). Responsibility for the provision of ATC service in this airspace is delegated to various countries.

Offshore. Offshore airspace is defined by Title 14 of the Code of Federal Regulations (14 CFR) part 71, §§ 71.31 and 71.71. It is designated in international airspace within areas of domestic radio navigational signal or ATC radar coverage, and within which domestic ATC procedures are applied.

P

Performance-Based Navigation (PBN). RNAV-based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure (IAP), or in a designated airspace.

R

Receiver Autonomous Integrity Monitoring (RAIM). An algorithm that verifies the integrity of the position output using GPS measurements, or GPS measurements and barometric aiding.



Remote Continental. Remote continental airspace is defined as airspace above terrain where line-of-sight communications, independent surveillance and reliable ground-based NAVAIDs is not available. Controllers provide ATSS utilizing procedural control and procedural separation.

Required Navigation Performance (RNP). RNP is a statement of the 95 percent navigation accuracy performance that meets a specified value for a particular phase of flight or flight segment and incorporates associated onboard performance monitoring and alerting features to notify the pilot when the RNP for a particular phase or segment of a flight is not being met.

RNAV. See Area Navigation (RNAV) above.

RNP/RNAV Procedure. An RNP/RNAV Procedure includes instrument departure procedures (DP), standard terminal arrivals (STAR), and instrument approaches based on PBN.

RNP Value. The RNP value designates the 95 percent LNAV performance (in NM) and the related monitoring and alerting requirements associated with an RNP instrument flight operation or a particular segment of that instrument flight.

RNP System. An RNAV system which supports onboard performance monitoring and alerting. For the purposes of this AC, RNP systems comply with Appendices A-I, as appropriate.

Total System Error (TSE). The difference between the true position and the desired position and is equal to the vector sum of the FTE, PDE, and NSE.

W

Waypoints. A waypoint is a predetermined geographical position that is defined in terms of latitude/longitude coordinates. Waypoints may be a simple named point in space or associated with existing NAVAIDs, intersections, or fixes. A waypoint is most often used to indicate a change in direction, speed, or altitude along the desired path. RNAV procedures make use of both flyover and flyby waypoints.



Acronyms

Acronym	Meaning
14 CFR	Title 14 of the Code of Federal Regulations
91K	Part 91 Subpart K (14 CFR)
AC	Advisory Circular
AEG	Aircraft Evaluation Group
AFCS	Automatic Flight Control System
AFM	Airplane Flight Manual
AFMS	Airplane Flight Manual Supplement
AGL	Above Ground Level
AIP	Aeronautical Information Publication
AIR	Aircraft Certification Service
AMC	Acceptable Means of Compliance
ANP	Actual Navigation Performance
A RNP	Advanced Required Navigation Performance
ATC	Air Traffic Control
CHDO	Certificate Holding District Office
CMO	Certificate Management Office
CPDLC	Controller Pilot Data Link Communications
CTA/FIR	Control Area/Flight Information Region
DME	Distance Measuring Equipment
DP	Departure Procedure
DTK	Desired Track
FAA	Federal Aviation Administration
FDE	Fault Detection and Exclusion
FGS	Flight Guidance System
FIR	Flight Information Region
FMC	Flight Management Computer
FMS	Flight Management System
FRT	Fixed Radius Transition
FS	Flight Standards Service
FSDO	Flight Standards District Office
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
ICAO	International Civil Aviation Organization
INS	Inertial Navigation System
IRS	Inertial Reference System
IRU	Inertial Reference Unit
LNAV	Lateral Navigation
LOA	Letter of Authorization



Acronym	Meaning
LRN	Long Range Navigation
LRNS	Long Range Navigation System
MEL	Minimum Equipment List
MSpec	Management Specification
Nav Spec	Navigation Specification
NM	Nautical Mile
NOTAM	Notice to Airmen
NSE	Navigation System Error
OEM	Original Equipment Manufacturer
OpSpec	Operation Specification
PBN	Performance Based Navigation
PF	Pilot Flying
PI	Principal Inspector
POH	Pilot's Operating Handbook
POI	Principal Operations Inspector
RAIM	Receiver Autonomous Integrity Monitoring
RNAV	Area Navigation
RNP	Required Navigation Performance
SAO	Special Areas of Operation
SB	Service Bulletin
SBAS	Satellite Based Augmentation System
SIS	Signal in Space
SLOP	Strategic Lateral Offset Procedure
SOC	Statement of Compliance
STC	Supplemental Type Certificate
TC	Type Certificate
TOAC	Time of Arrival Control
TSE	Total System Error
TSO	Technical Standard Order
WATRS	West Atlantic Route System
WGS	World Geodetic System