FLIGHT TECHNOLOGIES AND PROCEDURES DIVISION

Polar Operations & Operations in Areas of Magnetic Unreliability

Application Guide

Guide to Assist Part 91K, 121, 125, and 135 operators with:

B040 and B055

Version 1.0

NextGEN

FEDERAL AVIATION ADMINISTRATION

FLIGHT TECHNOLOGIES AND PROCEDURES DIVISION

Federal Aviation Administration

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Document Changes

Version	Date	Description of Change
1.0	8/15/2025	*Initial Draft*

Contents

Section 1

Section 1: Introduction

This application guide is for the following authorizations:

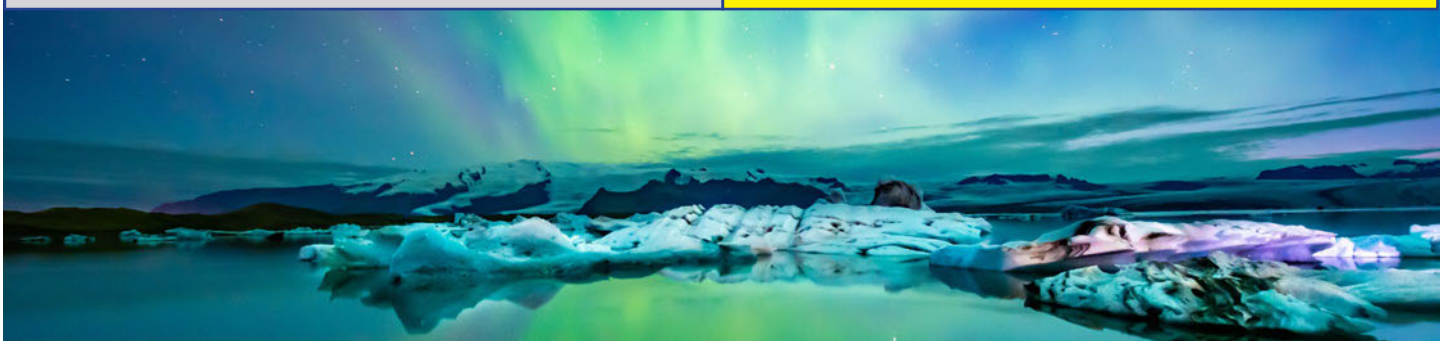
- ✈ B040, Operations in Areas of Magnetic Unreliability (AMU), and/or
- ✈ B055, North Polar Operations.

For certificated operators, both authorizations are usually required when operating in North Polar airspace, which is defined as that area that lies north of latitude 78° north. Tables 1-1 and 1-2 provide other authorizations that may be required for your operation. South Polar Operations are authorized in B050, Authorized Areas of En Route Operations, Limitations, and Provisions, and include the B040 authorization as a mandatory reference paragraph. In addition, many of the considerations valid for the B055 authorization are also valid for South Polar Operations.

This application guide was developed by the Federal Aviation Administration (FAA) Flight Technologies and Procedures Division (AFS-400) to provide operators with an organized method for submitting required content as part of an application package for AMU and North Polar operations. This guide is optional but recommended for expeditious handling. For your convenience, there is an "Application Checklist" at A.3.

For new applications, operators should schedule a pre-application or "kickoff" meeting/ teleconference with your Flight Standards (FS) Office. Your Principal Inspector (PI) will provide the appropriate guidance.

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



1.1 Applicability

This guide is for certificate holders/operators/program managers conducting aircraft operations under 14 CFR Parts 91K, 121, 121/135, 125 (including Part 125 Letter of Deviation Authority (LODA) holders), and 135.

1.2 Terms and Symbols

Current AC: Unless there is a letter at the end of the AC designation, it is linked to the most current version.

Identically Equipped: "Identically equipped" refers to an aircraft that is of the same Make, Model, and Series (MMS) as another aircraft or fleet previously approved for B040 and/or B055 authorization. Such aircraft must be functionally and operationally identical, commonly referred to as "sister ships," including equivalency in avionics architecture, installed software versions, flight deck configuration, and aircraft performance capabilities. The Principal Inspector (PI) may determine on a case-by-case basis whether minor configuration differences are acceptable within the scope of "identically equipped.

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

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).

1.3 Aircraft/Fleet

This application guide is for submitting a single-make, model and series (MMS) of an aircraft. If the operator submits an application to add identically equipped MMS aircraft to an existing authorization, then no additional PI review and authorization is necessary. Use separate application(s) for different MMS aircraft or for those **not** identically equipped.

1.4 Upgrades in Aircraft or Equipage or adding to Aircraft Fleet

For those operators with an existing B040 and/or B055 authorization, this guide may be used to update applicable aircraft navigation system components listed in B040 and/or B055. This application guide may also be used to add additional aircraft to your current authorization. See the selection of these options in Section 2.

1.5 Extended Operations (ETOPS)

In addition to a B040 and/or B055, Part 121 or Part 135 operators may need an Extended Operations (ETOPS) OpSpec. For more information on ETOPS, see AC 120-42, *Extended Operations (ETOPS and Polar Operations)* or AC 135-42, *Extended Operations (ETOPS) and Operations in the North Polar Area*, as applicable.

1.6 Operation in Areas of Magnetic Unreliability (AMU)

Operations Specification (OpSpec)/Management Specification (MSpec)/part 125 Letter of Authorization (LOA) B040 authorizes operations in AMU. A validation process is necessary for the FAA to assess the operator's ability to conduct flights in AMU in accordance with guidance in FAA Order 8900.1. When the operator successfully completes this process, OpSpec/MSpec/part 125 LOA B040 may be issued. For more information on flight operations in AMUs, see AC 91-70, Oceanic and Remote Continental Airspace Operations.

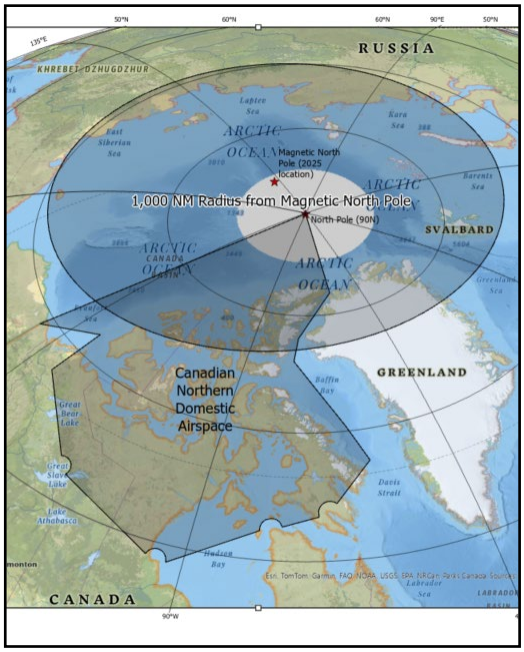
When flying great circle courses at latitudes greater than 67 degrees, convergence of the meridians can create rapid changes in true headings and true courses with small changes in aircraft position. When even small errors occur, very large navigation errors can develop over extremely short distances. Operations within these areas can only be conducted safely *if the primary heading reference is derived from sources other than magnetic*. This area of operation changes over time due to the movement of the magnetic pole at a rate of about 45 km per year in a north-northwest direction.

To operate in polar areas or AMUs, the aircraft must be equipped with dual operable long range navigation systems. Before you can apply for a B040, OpSpec/MSpec/part 125 LOA **B036 is a prerequisite** except for operators with OpSpec/MSpec/part 125 LOA B033 that are able to conduct One Hour Reliable Fix (1HRF) Operations within an AMU. There are two application guides for *Oceanic Required Navigation Performance (RNP) & North Atlantic High Level Airspace (NAT HLA)*. One application guide is devoted to Part 91 operators applying for B036 and/or B039 and the other is for certificated operators (i.e. Part 91K, 121, 125, and 135) applying for B036, B037, B038, and/or B039.

AMU operations using Global Positioning System (GPS) as the sole navigation source require careful analysis to confirm that the flight management system (FMS) is receiving accurate and reliable heading information. Conventional magnetic compasses sense magnetic direction by detecting the horizontal component of Earth's magnetic field. Since this horizontal component vanishes near the magnetic poles, magnetic compasses are highly unreliable and unusable in an area approximately 1,000 NM from each magnetic pole. Within these areas, air navigation tasks are further complicated by very rapid changes in magnetic variation over small distances. For example, when flying between the magnetic North Pole and the true North Pole, a heading of true north results in a magnetic heading of south (a magnetic variation of 180 degrees).

1.7 Northern AMU

The FAA designates the northern AMU as the area within a 1,000 NM radius around the magnetic North Pole, except for airspace over Alaska and its territorial waters. The Canadian AIP and Transport Canada's (TC) Designated Airspace Handbook establish the basic boundaries for the Canadian NDA, which the FAA additionally designates as part of the Northern AMU.



The Northern AMU spans parts of the following B050 Areas of Operation, where an OpSpec B040 should be added as a reference paragraph:

- Canada—Canadian Minimum Navigation Performance Specification Airspace (C-MNPS)
- Canada—Excluding Canadian MNPS
- North Polar Area
- Russia, Mongolia, and the Commonwealth of Independent

States (CIS)

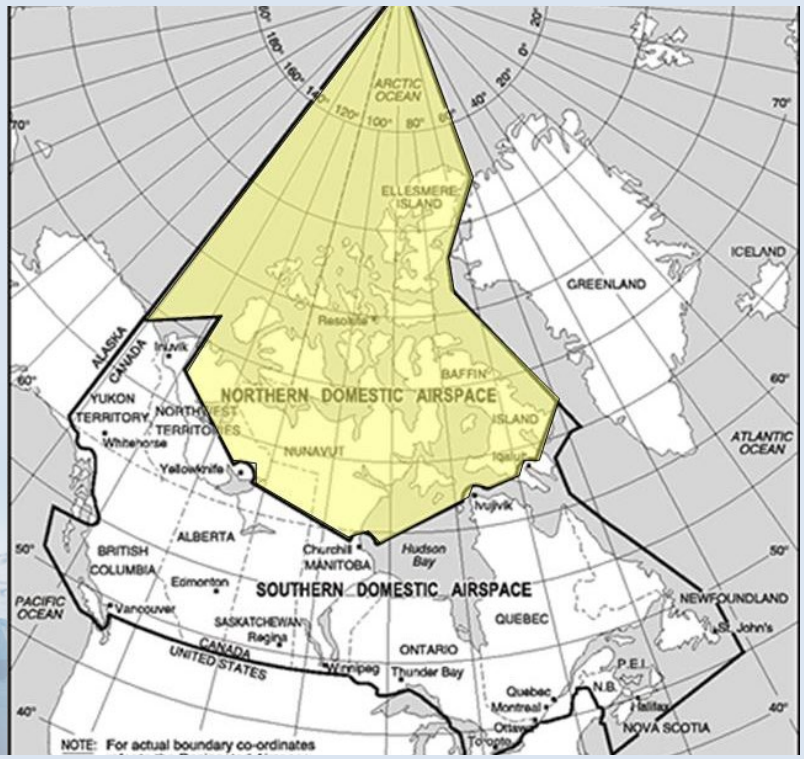
- Europe and Mediterranean Sea (e.g., includes Svalbard archipelago, Norway)
- Atlantic Ocean—The Atlantic Ocean Islands/Nations (e.g., Greenland)
- Atlantic Ocean—Atlantic Ocean at Flight Levels Above and Below North Atlantic High Level Airspace (NAT HLA) Boundaries
- Atlantic Ocean—Atlantic Ocean NAT HLA
- Pacific Ocean—The North Pacific Ocean

1.9 Canadian Airspace Considerations

Canadian Domestic Airspace (CDA) includes Northern Domestic Airspace (NDA), shown in yellow in the map below. For more information on operating within the NDA, see Technical Airworthiness Authority Advisory (TAA) 2017-02e-v3.

NDA (True)

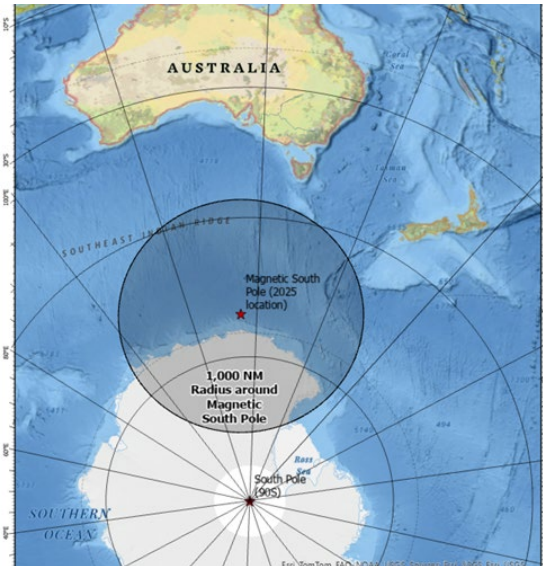
In the NDA, all headings and tracks are given in degrees true rather than magnetic.



1.8 Southern AMU

The FAA designates the Southern AMU as the area within a 1,000 NM radius around the Magnetic South Pole. The Southern AMU therefore spans parts of three B050 Areas of Operation, where, as applicable, OpSpec B040 should be added as a reference paragraph:

- South Polar Area
- Indian Ocean
- Central and South Pacific Ocean



1.10 North Polar Operations

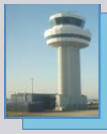
B055 authorizes operators to operate in a north polar area that lies north of latitude 78°00’00” N (refer to 14 CFR part 135, § 135.98 and CFR part 121, Appendix P). Operators must also receive FAA approval for flights in the AMU with OpSpec/MSpec/ part 125 LOA, B040. You may apply for both B040 and B055 by using this application guide. Additionally, Operators may also require FAA approval for flight in the Canadian Minimum Navigation Performance Specification Airspace (C-MNPS) and other areas as based on your planned north polar routing(s). This will determine the appropriate areas of operation to be included on a OpSpec/MSpec/part 125 LOA, B050. For other associated authorizations see Tables 1-1 and 1-2 of this guide. Discuss with your PI your operational plans to determine which authorizations are required for your operation.

1.11 Standard Specifications for Aviation Turbine Fuels (ASTM D 1655)

ASTM D 1655 defines the international jet fuel quality standard requirements. It ensures safe and reliable aircraft operations by specifying critical properties such as freezing point, density, volatility, flash point, and composition. In polar areas, the ASTM D 1655 standard specifies the maximum freeze-point limits at -40°C for Jet A and −47 °C for Jet A-1.

In accordance with AC 120-42, Extended Operations and Polar Operations, requires operators to implement a fuel freeze strategy. This can be satisfied either by applying the ASTM freeze-point limits directly, or by using an FAA-accepted fuel temperature monitoring analysis program that provides equivalent or greater protection. ICAO Annex 6, Part I and Doc 9976 (Flight Planning and Fuel Management Manual) provide the overarching framework for in-flight fuel management and operator responsibilities in extended and polar environments. Together, these references/documents establish the policy structure under which ASTM D1655 and AC 120-42 supply the detailed technical and regulatory requirements.

B050 Authorized Areas: North Polar and South Polar. When applying for authorization to fly in the North Polar B050 Area, located north of 78° N latitude, or in the South Polar B050 Area, south of 60° S latitude, you will need to address the following:



Alternate Airports

Passenger Recovery

Low Fuel Temperature

Communication

Solar Flare

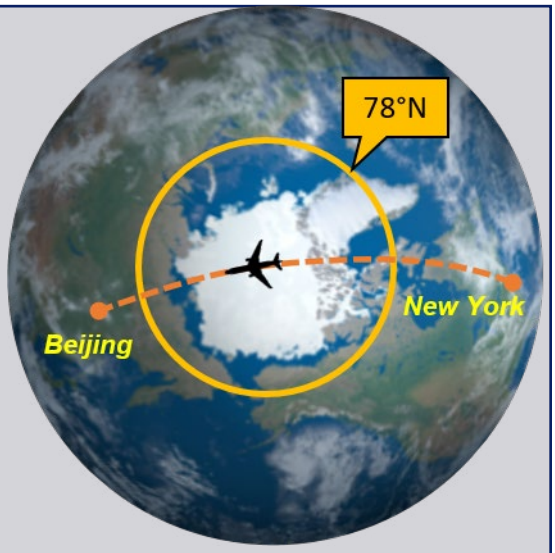
MEL

Validation Flight

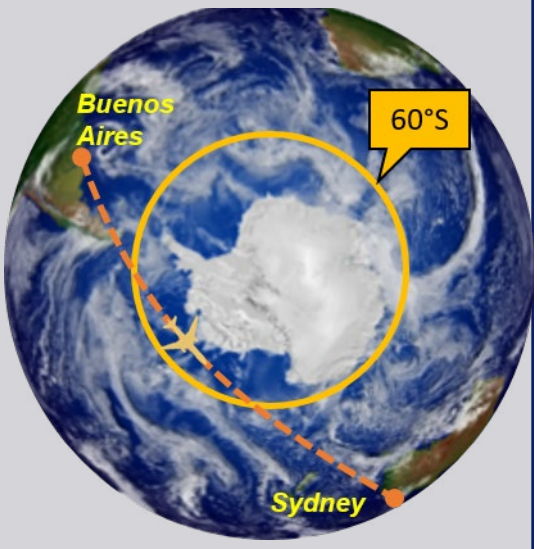
Training

Exposure Suits

Expanded Medical Kit



B050 North Polar Area, begins at 78° N Latitude



B050 South Polar Area begins at 60° S Latitude

1.12 Other Authorizations

Operators should consider other required and optional authorizations. Below is a list of authorizations to consider and Tables 1-1 and 1-2 provide an overview of required and optional authorizations for polar operations.

B033—IFR En Route Operations.
B040—Operations in Areas of Magnetic Unreliability.
B043—Special Fuel Reserves in International Operations.
B044—Planned Redispatch or Rerelease En Route.
B046—Operations in Reduced Vertical Separation Minimum (RVSM) Airspace.
B050—Authorized Areas of En Route Operations, Limitations, and Provisions

- Polar Areas—South Polar Area 60° South Latitude to the South Pole Inclusive
- Polar Areas—North Polar Area North of 78° North Latitude to the North Pole

B055—North Polar Operations.
B342—Extended Operations (ETOPS) with Two-Engine Airplanes Under Part 121 or 135.
B343—Performance-Based Contingency Fuel Requirements for Flag Operations.
B344—Extended Operations in Passenger-Carrying Airplanes With More Than Two Engines, Under Part 121 or 135.
B450—Sensitive International Areas

1.13 Tabletop and Validation Flight

Operators must conduct an FAA tabletop exercise and a validation flight prior to receiving authorization to fly polar routes and/or flight into AMU airspace. A simulated diversion must be scheduled at an approved en route diversion airport. This is intended to validate dispatch communication, coordination, airport facilities and reporting capabilities. This may be done with revenue passengers if a passenger recovery validation is already completed. However, if a passenger recovery validation is part of the simulated diversion, then only revenue cargo is permitted.

The carriage of cargo is encouraged for airplane Weight and Balance (W&B) purposes.

The operator will be evaluated for the following:

- Communications, Navigation, and Surveillance (CNS)
- Coordination,
- Facilities,
- Accuracy of Notices to Airmen (NOTAM) and weather information,
- Space weather information,
- Operability of ground equipment during the simulated diversion. and
- Other technical areas as required.

Coordinate with your PI to schedule the tabletop exercise and validation flight in advance to avoid scheduling conflicts and delays. Validations are accomplished in accordance with Order 8900.1, Volume 3, Chapter 29, Section 8.

Table 1-1 Required and Optional Authorizations for North Polar Operations

Authorization	91K	121	121/135	125	135
B033	Optional	Optional	Optional	Optional	Optional
B036	Required	Required	Required	Required	Required
B040	Required	Required	Required	Required	Required
B043	Optional	Optional	Optional	Optional	Optional
B044	Optional	Optional	Optional	Optional	Optional
B046	Optional	Optional	Optional	Optional	Optional
B050	Required	Required	Required	Required	Required
B055	Required	Required	Required	Required	Required
B342	Optional	Optional	Optional	Optional	Optional
B343	Optional	Optional	Optional	Optional	Optional
B344	Optional	Optional	Optional	Optional	Optional
B450	Required	Required	Required	Required	Required

Table 1-2 Required and Optional Authorizations for South Polar Operations

Authorization	**91K**	**121**	**121/135**	**125**	**135**
B033	Optional	Optional	Optional	Optional	Optional
B036	Required	Required	Required	Required	Required
B040	Required	Required	Required	Required	Required
B044	Optional	Optional	Optional	Optional	Optional
B050	Required	Required	Required	Required	Required
B342	Optional	Optional	Optional	Optional	Optional
B344	Optional	Optional	Optional	Optional	Optional
B450	Required	Required	Required	Required	Required

1.14 Guidance Documents

Refer to the following suggested guidance for polar and AMU operation:

- ***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 is true for all ACs, AC 91-70 is not mandatory but does contain internationally recommended best practices.
- ***AC 120-42, Extended Operations (ETOPS and Polar Operations).*** This AC provides certificate holders with guidance for obtaining operational approval to conduct Extended Operations (ETOPS) under Title 14 of the Code of Federal Regulations (14 CFR) part 121, § 121.161.
- ***AC 135-42, Extended Operations (ETOPS) and Operations in the North Polar Area.*** This AC provides certificate holders with guidance for obtaining operational approval to conduct Extended Operations (ETOPS) under Title 14 of the Code of Federal Regulations (14 CFR) part 135.
- ***AC 90-117, Data Link Communications*** This AC applies to all pilots, certificate holders, operators, and/or program managers conducting data link communication operations and to those providing data communication services on behalf of operators to meet FAA and ICAO requirements.
- ***AC 20-138, Airworthiness Approval of Positioning and Navigation Systems.*** As indicated by the title, this is primarily manufacturer guidance for airworthiness of position and navigation systems.
- ***AC 20-150, Airworthiness Approval of Satellite Voice (SATVOICE) Equipment Supporting Air Traffic Service (ATS) Communication.*** This AC provides guidance on airworthiness approval for designers, manufacturers, and installers of Satellite Voice (SATVOICE) equipment supporting air traffic service (ATS).

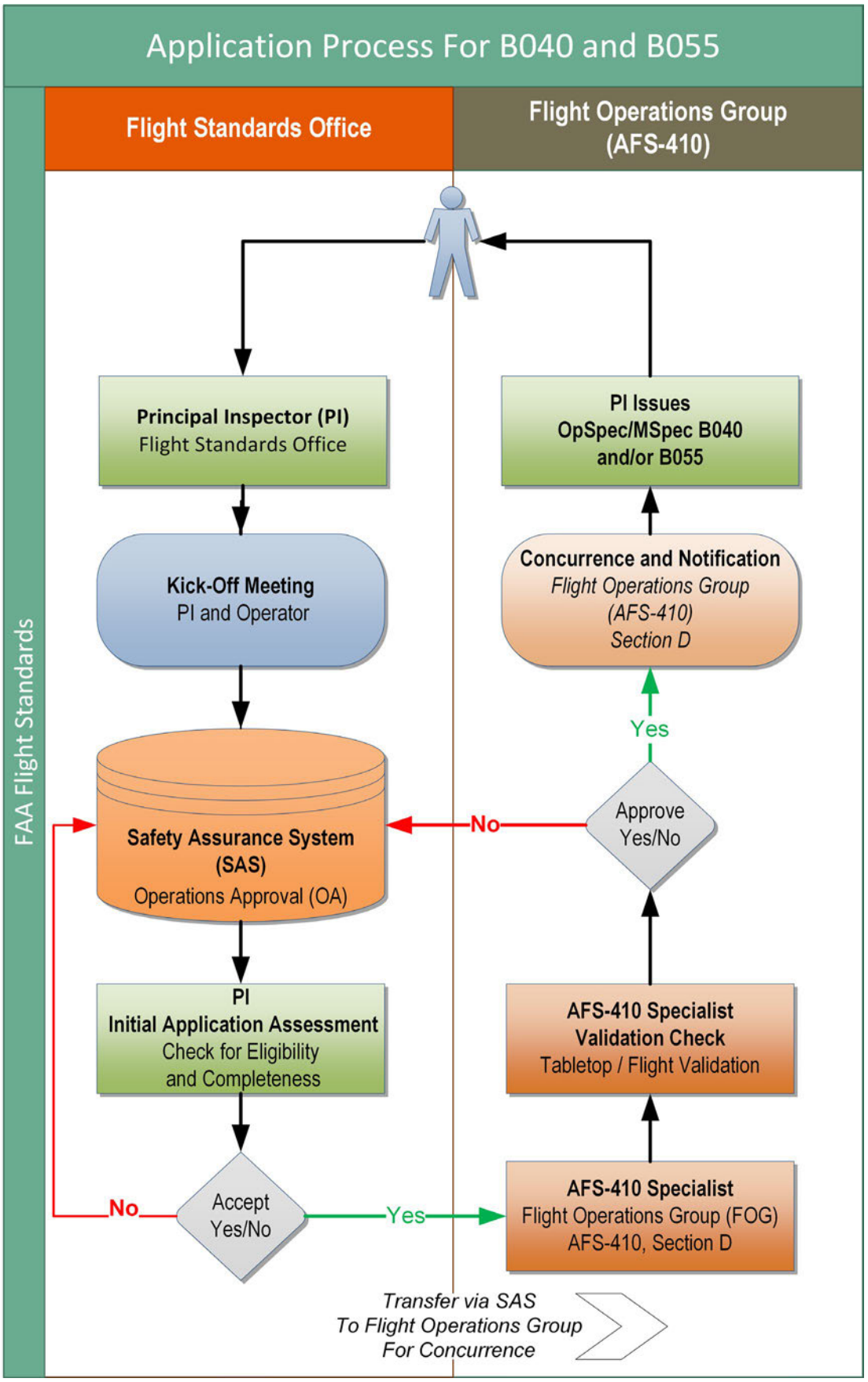
1.15 Application Process

The flowchart on the next page depicts the application process for OpSpec/MSpec B040 and B055. For comprehensive details, refer to FAA Order 8900.1, Flight Standards Information System, Volume 3, Chapter 18, Section 4.

Following initial contact with the PI, a kick-off meeting should be scheduled. This meeting is typically held via teleconference but may also be conducted by phone or in person. During the meeting, the PI will outline the application process, provide a link to the application guide, and give instructions for submitting the application through the FAA's Safety Assurance System (SAS). SAS functions as both a multi-purpose system and a repository for applications. Applications may be submitted electronically via email or through the FAA's Safety Assurance System (SAS) External Portal. Once the application is submitted in SAS, the PI will review it for eligibility and verify that all required documentation is attached. The PI will inform the operator if the application is incomplete or if there are eligibility issues. By following the instructions in this guide, operators may prevent submitting incomplete applications.

Once the PI is satisfied with the application, it is forwarded within SAS to the Flight Operations Group (FOG) (AFS-410), Section D and assigned to a specialist to continue the process with a tabletop exercise and validation flight. In accordance with FAA Order 8900.1, Volume 3, Chapter 29, Section 8, a tabletop exercise and validation flight are mandatory for initial approval of AMU, ETOPS, and north polar operations. The tabletop exercise is a simulation used by the FAA to evaluate systems, processes, and the operator's ability to manage specific scenarios. This exercise may include examining and discussing the documentation submitted with the application. The flight validation assesses compliance with regulations, proficiency in procedures, and adherence to safety protocols related to AMU, ETOPS, and north polar operations.

After receiving concurrence from AFS-410, the PI issues the OpSpec/MSpec B040 and/or B055 to the operator.


Application Process For B040 and B055
Flight Standards Office
Flight Operations Group (AFS-410)
FAA Flight Standards
Principal Inspector (PI)
Flight Standards Office
Kick-Off Meeting
PI and Operator
Safety Assurance System (SAS)
Operations Approval (OA)
PI
Initial Application Assessment
Check for Eligibility and Completeness
Accept Yes/No
No
Yes
Transfer via SAS
To Flight Operations Group
For Concurrence
AFS-410 Specialist
Flight Operations Group (FOG)
AFS-410, Section D
AFS-410 Specialist
Validation Check
Tabletop / Flight Validation
Approve Yes/No
No
Yes
Concurrence and Notification
Flight Operations Group
(AFS-410)
Section D
PI Issues
OpSpec/MSpec B040
and/or B055

1.16 Instructions

1. **Fill-in-the-Blank.** Use the fill-in-the-blank portion of this guide, Section 2, and include a letter or email of request explaining your intentions.
2. **Adding Aircraft.** If adding aircraft to an existing authorization(s) that are not the same make/model/series, or identically equipped, then fill out a separate application for each aircraft or fleet. See paragraph 1.3.
3. **Additional Authorizations**. Table 1-1 and Table 1-2 provide references of additional OpSpecs/MSpecs/Part 125 LOAs that may also be needed. Contact your PI for more information.
4. **Attachments.** With each attachment, include the corresponding reference number (e.g. EQP-1) next to each excerpt in a .pdf format 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. **Final Application Package Preparation.** See Appendix A for instructions on using Adobe Acrobat to attach files and the naming convention for submitting this application guide with attachments. This appendix includes a checklist to aid you in making sure your application is complete.
6. **Application Submission.** Submit the completed application to the Flight Standards District Office in your region or send it to your principal inspector. Applications may be submitted electronically via email or through the FAA's Safety Assurance System (SAS) External Portal. For access to SAS external portal click ***Sign up for SAS*** under the Login button.

   Note: Submissions using the Operations Approval (OAPS) functionality can be entered via the SAS Configuration [Module 1], in accordance with Order 8900.1, Volume 3, Chapter 1, Section 1.

Section 2: Application Form

2.1 Application Type

Date: _____ ☐ *Letter or Email of Request is Attached*

Select one of the following application types below:

OpSpec/MSpec/Part 125 LOA B040

OpSpec/MSpec/Part 125 LOA B055

OpSpec/MSpec/Part 125 LOA B040 and B055

Adding a Different MMS or not Identically Equipped Aircraft to an existing B040 and/or B055

Upgrading FMS /Navigation to an existing B040 and/or B055

Note: *If adding an identically equipped aircraft, no application guide is needed. Just inform your PI of the additional aircraft. "Identically equipped" means that an aircraft is identical in every way including MMS, avionics, software, flight deck configuration, and performance as the initial authorization. Minor differences may be accepted as "identically equipped" on a case-by-case basis by the PI.*

2.2 Contact Information

Point of Contact for the Application *This is the person the FAA will contact about the contents of this application.*	
Name:	*Phone:*
Email:	
Aircraft Owner *The person/entity that is the registered owner of the aircraft*	
Name:	

Aircraft Operator

This is the person/ entity with operational control of the aircraft (type complete legal name)

Name:	*4 letter FAA Designator:*

Principal Base of Operations

The physical address where the operator conducts business or resides

Street:		*Suite*	
City:	*State/Province:*	*Country:*	*Postal Code:*
	Select /	United States	

Mailing Address for the Operator

(if different from Principal Base of Operations address)

Street:		*Suite*	
City:	*State/Province:*	*Country:*	*Postal Code:*
	Select /	United States	

Principal Inspector (PI)

The FAA Aviation Safety Inspector (ASI) assigned to evaluate eligibility for B040 and/or B055 authorizations.

Name:	*Phone:*

Email:

2.3 Aircraft

Aircraft Information

Manufacturer:	*Model:*	*Series:*

Aircraft Registration and Serial Numbers

2.4 Areas of Operation

Operations	B050 Polar Areas Needed
	☐ *Polar Areas --North Polar Area North of 78° North Latitude to the North Pole* ☐ *Polar Areas --South Polar Area 60° South Latitude to the South Pole Inclusive*

List of planned city pairs (list countries)/routes

2.5 Avionics

Table 2-1: Communication/Navigation/Surveillance (CNS) Equipment Information

Relevant regulations are Part 91, §§91.511 and 91.703; Part 135, §135.165; and Part 121, §121.351. Your aircraft must have voice two-way radio communication that is adequate for maintaining a continuous air-to-ground voice communication watch on the appropriate communication channel to comply with ICAO Annex 2, paragraph 3.6.5.

Number Installed	Type	Manufacturer(s)	Model(s)	Additional Notes/Limitations	ATC Flight Plan Field 10A/B	ATC Flight Plan Field 18
0	FMS					
0	GNSS					
0	IRS					
0	HF					
0	SATVOICE					
0	TCAS					
0	FANS					

Table 1-3 Notes:

Table 1-1 Reference Appendix 4 of the US Aeronautical Information Manual or FAA Flight Planning Information

Table 1-2 Approved SATVOICE must be installed in accordance with AC 20-150( )

Table 1-3 For the IRS row, include RNP time limit in the “Additional Notes/Limitations” column.

Section 3: Aircraft Eligibility Attachments

For each attachment, identify the necessary page(s)/paragraph(s) to establish compliance. Include the corresponding reference numbers with each attachment in a separate PDF document. Please highlight the requested text within the documentation and attach the document to this application guide using the Adobe Acrobat attachment feature (see explanation in Appendix A). Select N/A, if not applicable. Also, please attach your entire AFM and AFM Supplement so references/excerpts can be evaluated in context.

3.1 Equipage and Aircraft Eligibility

Reference Number	Attached	N/A	Equipage Attachments
EQP-1	○	○	**Magnetic and True Heading Capability.** Provide documentation from the Airplane Flight Manual (AFM) or appropriate reference verifying that the aircraft is equipped with a means to switch between magnetic and true heading references. The documentation must specify whether this switching is accomplished manually by the flight crew (e.g., via a cockpit selection or control input), or automatically by the aircraft's avionics system based on latitude, FMS database logic, or other programmed parameters. *Source: AC 20-138, Order 8900.1, Volume 3, Chapter 18, Section 4* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "AFM, paragraphs 3.5 and 3.6."*

Reference Number	Attached	N/A	Equipage Attachments
EQP-2	○	○	**GNSS Navigation.** If your aircraft uses GPS as a sole LRNS source, provide documentation from the Original Equipment Manufacturer (OEM) to confirm the flight management system (FMS) is receiving accurate and reliable heading information during AMU operations. For AMU operations, it is recommended to also have an inertial navigation sensor. *Source: AC 20-138, Order 8900.1, Volume 3, Chapter 18, Section 4* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "AFM, paragraphs 3.5 and 3.6."*
EQP-3	○	○	**Cold Weather Exposure Suits.** Provide documentation showing that at least two cold weather exposure suits are on board the aircraft. These suits are required should it become necessary to safely coordinate with ground personnel at a diversion airport in extreme cold climatic conditions. *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "AFM, paragraphs 3.5 and 3.6."*

Section 4: Operational Attachments

For each attachment, provide the necessary page(s)/paragraph(s) to establish compliance. Please highlight the requested text within the documentation and attach the document to this application guide using the Adobe Acrobat attachment feature (see explanation in Appendix A). Select N/A, if not applicable.

Include your entire International Operations Manual (IOM) or relevant sections of your General Operations Manual (GOM) or Flight Operations Manual (FOM) that address Polar and AMU operations.

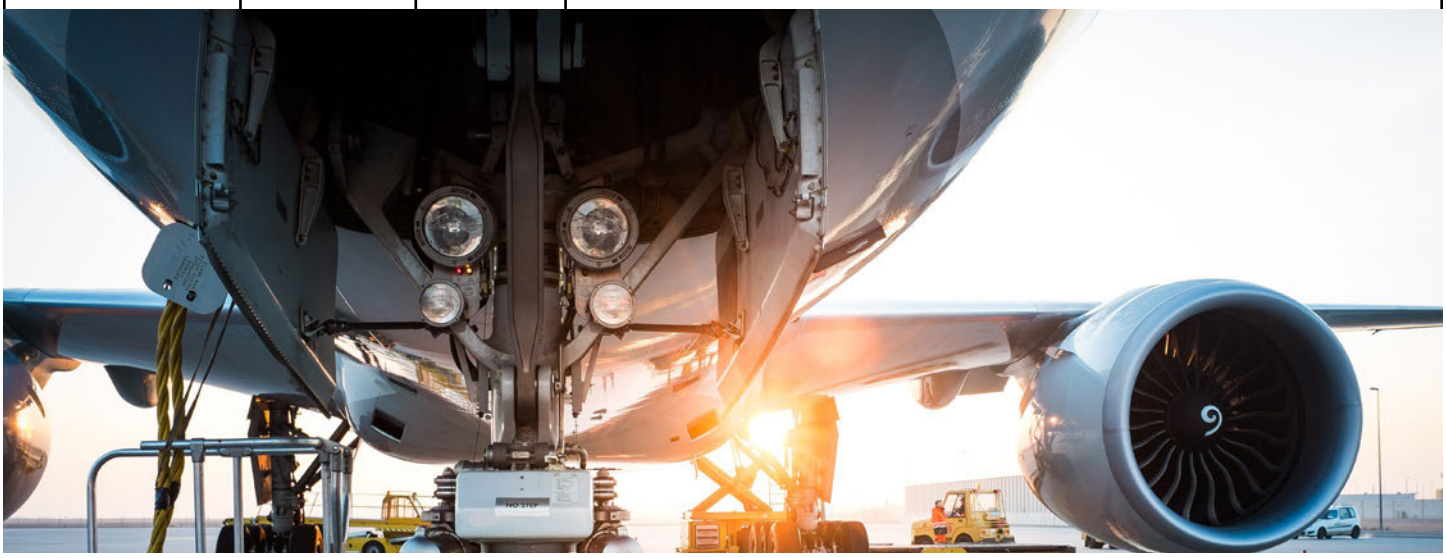
This section includes the minimum operational requirements in the following areas:

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

4.1 Operational Procedures

Reference Number	Attached	N/A	Operational Attachments
OPS-1	○	○	**Preflight Procedures.** Provide IOM documentation (or references) of your preflight procedures for flights to enter polar airspace. This should include: • Ensuring cold weather exposure suits are on board (at least two are required), • Plan to ensure communication capability for operations, • Solar flare activity, space weather advisories, predictions, and radiation exposure, • Fuel planning for ETOPS (as applicable) to include contingencies with the following considerations: ✈ One Engine Inoperative and the single engine service ceiling; ✈ Rapid decompression and descent without power loss (both engines operating); ✈ Rapid decompression and descent with power loss (one engine inoperative); and ✈ APU operation, if required during emergency procedures. *Sources: AC 91-70, Oceanic and Remote Continental Airspace Operations, AC 120-42, Extended Operations (ETOPS and Polar Operations) AC 135-42, Extended Operations (ETOPS) and Operations in the North Polar Area, 14 CFR part 135, Appendix G* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*

Reference Number	Attached	N/A	Operational Attachments
OPS-2	○	○	**Passenger Recovery Plan (Commercial Passenger Operations).** Provide your passenger recovery plan as required by §121.135 or as applicable. This plan should include the following: • Available facilities to provide for the physiological needs of the passengers and crewmembers such as continuing safety, food, and shelter, • Method of offloading the passengers and crewmembers in a safe manner during adverse weather conditions, • Transportation to extract passengers and crewmembers as soon as possible (execution and completion of the passenger recovery is expected within 48 hours following diversion), • Medical Care, and • Adequate Communications. **Note:** If you plan to keep passengers on board the aircraft using its capabilities and services as a sole means to satisfy all or part of the requirements of a passenger recovery plan, then consider the time-limited factors of such contingency. *Sources: AC 120-42, Extended Operations (ETOPS and Polar Operations) AC 135-42, Extended Operations (ETOPS) and Operations in the North Polar Area* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*



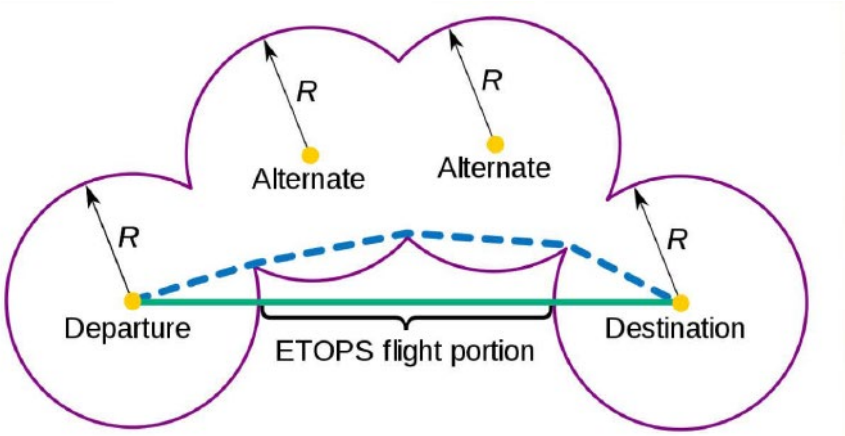
Reference Number	Attached	N/A	Operational Attachments
OPS-3	○	○	**Switching Between Magnetic (MAG) and True (TRU) Heading.** Operations in AMU SAO involve magnetic compasses that are highly unreliable and unusable in an area approximately 1,000 NM from each magnetic pole. For that reason, operators must provide procedures for Switching Between Magnetic (MAG) and True (TRU) Heading. Please provide your procedures for manually switching from MAG heading to TRU heading and vice versa or procedures for ensuring the appropriate heading was accomplished via an automatic switching system. *Sources: AC 91-70, Oceanic and Remote Continental Airspace Operations* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*
OPS-4	○	○	**Designating Alternates.** Provide procedures for designating alternates, especially along ETOPS routes. These procedures should include the following: • One or more alternates that can reasonably be expected to be available in a variety of weather conditions to support a necessary diversion; • Sufficient fuel as required by §121.646, if applicable, and should be able to make a safe landing and the airplane maneuvered off the runway at the selected diversion airport; and • Safe alternates with the following: emergency services, NAVAIDS, weather, communication, lighting, ATS, and at least one Instrument Approach Procedure (IAP) *Source: AC 120-42, Extended Operations (ETOPS and Polar Operations) AC 135-42, Extended Operations (ETOPS) and Operations in the North Polar Area* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*

Reference Number	Attached	N/A	Operational Attachments
OPS-5	○	○	**Fuel Freeze Procedures** Provide your procedures for monitoring and preventing fuel freezing in North Polar airspace (e.g. above 78° N latitude). Include procedures for determining the fuel freeze temperature of the fuel load on board the airplane. Your procedures should include coordination between maintenance, dispatch (part 121), flight locators (part 135), and assigned pilots to determine potential fuel freeze temperature of the fuel load on board the airplane. Your en route procedures should include: • Climb/descend to warmer temperatures, • Deviate course to warmer temperatures, and/or • Increase mach number. *Source: AC 120-42, Extended Operations (ETOPS and Polar Operations) AC 135-42, Extended Operations (ETOPS) and Operations in the North Polar Area. Also, reference the information in paragraph 1.11, Standard Specifications for Aviation Turbine Fuels (ASTM D 1655).* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*

Reference Number	Attached	N/A	Operational Attachments
OPS-6	○	○	**Solar Flare and Radiation** Provide your procedures for dealing with solar flare activity as it relates to HF reception becoming marginal or degraded/unusable. Space weather may also impact navigation signals from space-based and ground-based transmitters as well as on board avionics components. See NOAA Space Weather. *Source: AC 91-70, Oceanic and Remote Continental Airspace Operations* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*

4.2 Minimum Equipment List (MEL)

Reference Number	Attached	N/A	MEL Attachment
MEL-1	○	○	Provide your FAA-approved Minimum Equipment List (MEL), or, if applicable, your approved Master Minimum Equipment List (MMEL) when used in lieu of an MEL (uncommon for international operations). The MEL or MMEL must reflect provisions appropriate to ETOPS, AMU, and/or polar operations. *Source: AC 120-42 Extended Operations (ETOPS and Polar Operations)* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*



Reference Number	Attached	N/A	Flight Plan Attachment
FLP-1	○	○	Provide a sample FAA flight plan (Form 7233-4) representative of ETOPS, AMU and/or polar flight. Include the following: ✈ A sample Master Document OFP/crew flight plan/computer flight plan. ✈ A sample Air Traffic Control (ATC) flight plan (FAA Form 7233-4) with codes entered in Fields 10 and 18 supported by installed and authorized equipment (EQP section) (e .g., A056 authorization required for Item 10a Code P2 and C384 authorization required for Item 18 Code Tl or T2), ✈ Equal Time Point (ETP) analysis, ✈ Fuel planning for contingencies (i.e. One Engine Inoperative (OEI) decompression), ✈ Additionally, provide the following, as applicable: • Sample Track Message, normally provided with Operational Flight Plan (OFP), and • Sample graphic depiction of tracks and ETPs normally provided with OFP - Sample applicable NOTAMs, GPS NOTAMS and RAIM prediction. Below are resources to aid in your flight planning: ✈ AC 91-70 (addresses Master Document) ✈ FAA Form 7233-4 ✈ FAA Flight Planning Information

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Section 5: Training Attachments

This section is to provide documentation from your training program that addresses the operational practices in polar and AMU operations. For each attachment, provide the relevant page(s)/paragraph(s) reference to establish compliance. Please highlight the requested text within the documentation and attach the document to this application guide using the Adobe Acrobat attachment feature (see explanation in Appendix A). Select N/A, if not applicable.

Reference Number	Attached	N/A	Training Attachments
TNG-1	○	○	**Passenger Recovery (Commercial Passenger Operations)** Provide documentation of training flight crewmembers and dispatchers relative to their respective roles in the certificate holder's passenger recovery plan (§ 121.415). *Source: AC 120-42 Extended Operations (ETOPS and Polar Operations)* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*

Reference Number	Attached	N/A	Training Attachments
TNG-2	○	○	**Flight Crew and Dispatcher Training** Provide documentation that your pilots and dispatchers have been trained for AMU and polar operations. This training should include the following: • Unique aspects of ETOPS, as applicable • Contingencies (i.e. engine failure, depressurization, communication, and navigation failures etc.), • Route-specific training on weather patterns, • Training in the use of the cold weather anti-exposure suit, • QFE/QNH and meter/feet conversions (required for flight crewmember and dispatcher training), • Fuel freezing issues in extreme cold polar environments, • True (TRU)/Magnetic (MAG) switching procedures entering/ leaving AMU/NDA airspace. • Relevant airplane system limitations (for example fuel temperature limits), • Role of the maintenance department in providing airplane systems capability information to dispatch and flight crewmember to aid the PIC in diversion decision making; and • Solar flare activity and radiation exposure (see AC 120-61) • All other applicable operator provided Pilot and Dispatcher Polar and/or AMU Training. *Source:AC 120-42, Extended Operations (ETOPS and Polar Operations) AC 135-42, Extended Operations (ETOPS) and Operations in the North Polar Area* *Applicant notes/references. Please provide the name of the supporting document as well as page(s)/paragraph(s) references, e.g., "IOM, paragraphs 3.5 and 3.6."*

Section 6: Additional Attachments/Information

6.1 Additional PI Requested Documentation

This section is included to allow any additional information that may be requested by your PI and/or AFS-410. If additional information is requested by the POI and/or AFS-410, provide the necessary page(s)/ paragraph(s) to establish compliance. Include the reference number and highlight the requested text within the documentation and attach the document to this application guided using the Adobe Acrobat attachment feature (see explanation in Appendix A). Select N/A, if not applicable.

Reference Number	Attached	N/A	Additional PI Requested Documentation
POI-1	○	○	If requested, attach additional documentation requested by your PI.

6.2 Document Reference

Document List
AC 120-42, Extended Operations (ETOPS and Polar Operations) or
AC 135-42, Extended Operations (ETOPS) and Operations in the North Polar Area, as appropriate
AC 20-138, Airworthiness Approval of Positioning and Navigation Systems.
AC 91-70, Oceanic and Remote Continental Airspace Operations
U.S. Aeronautical Information Publication (AIP)
Aeronautical Information Manual (AIM). (U.S. Link)
Notices to Airmen (NOTAM). (U.S. Link)
AC 90-117, Data Link Communications

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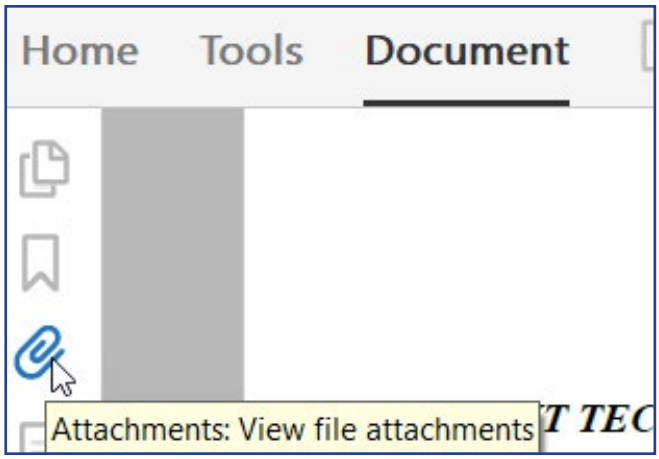
Appendix A

Appendix A: Final Application Preparations

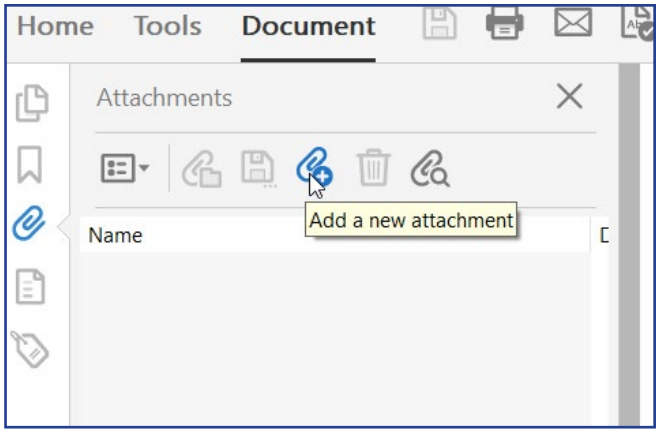
A.1 How to Attach Documents using Adobe Acrobat

Attach files to this PDF using the Acrobat attachment feature. Send your application with all the attachments in one file. Use the naming convention described in paragraph A.2 for your file name. This method will result in ONE PDF WITH ATTACHMENTS. Attach document with Acrobat as follows:

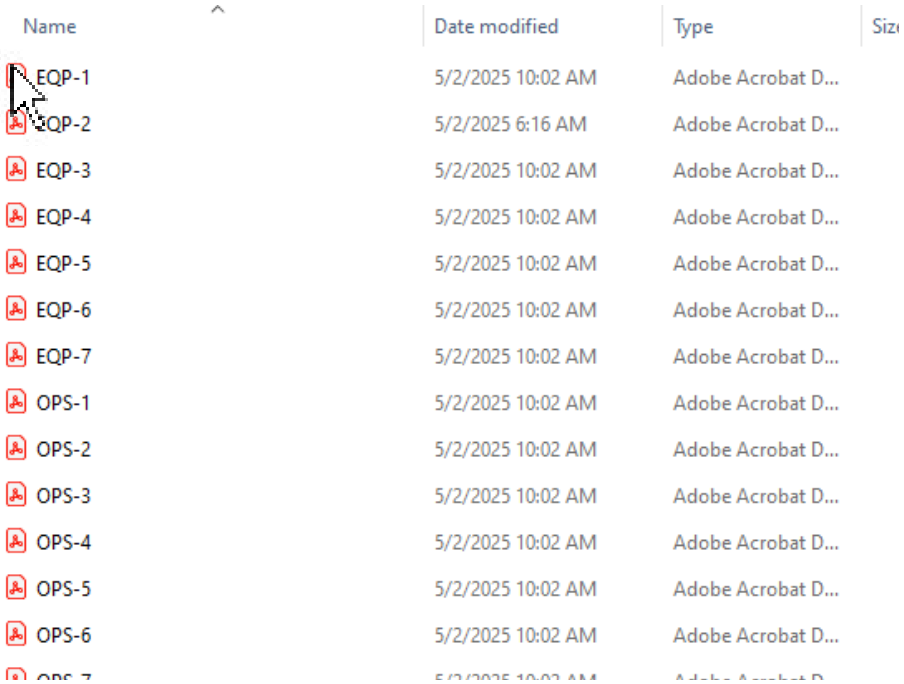
1. Click the Paper Clip icon in the left margin of this application guide:



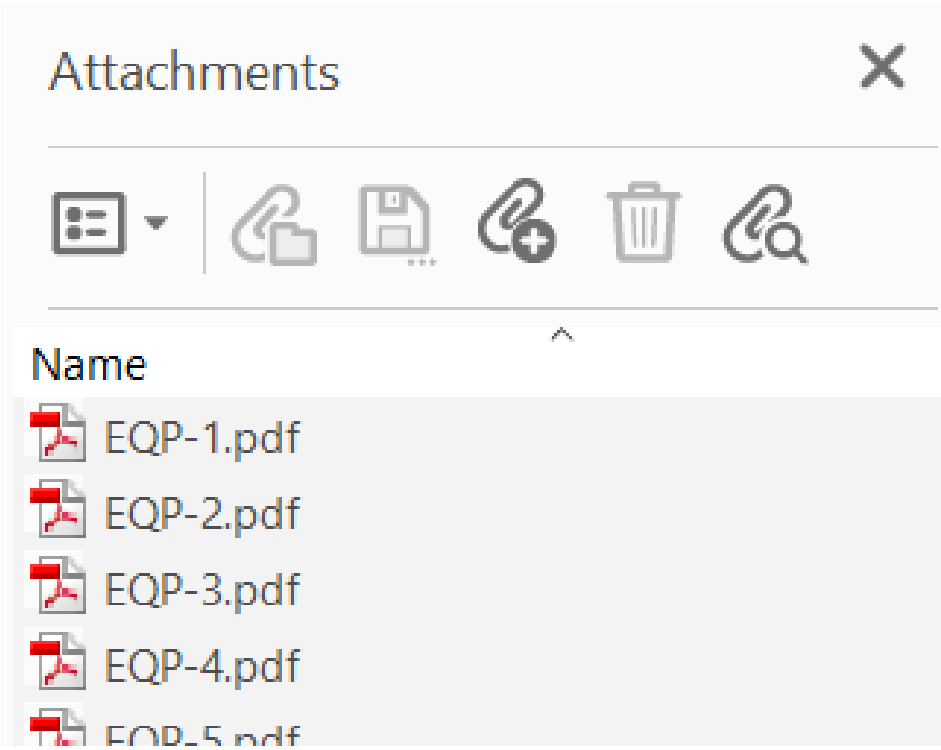
2. To Add Files click the and browse for the file attachments on your computer.



3. Click on the files to attach to your application.



4. Make sure you have added all the necessary files including any addendum attachments needed for the OpSpecs which are to be included in your application.



A.2 Naming Convention

Use the following file naming convention when submitting this application guide with attachments for B040/ B055.

B040/B055_Application_Company/Name_Date(XX_XX_XXXX)_Version_Number_(VX)

Example: B040/B055_Application_ABCAirlines_03_29_2025_V1

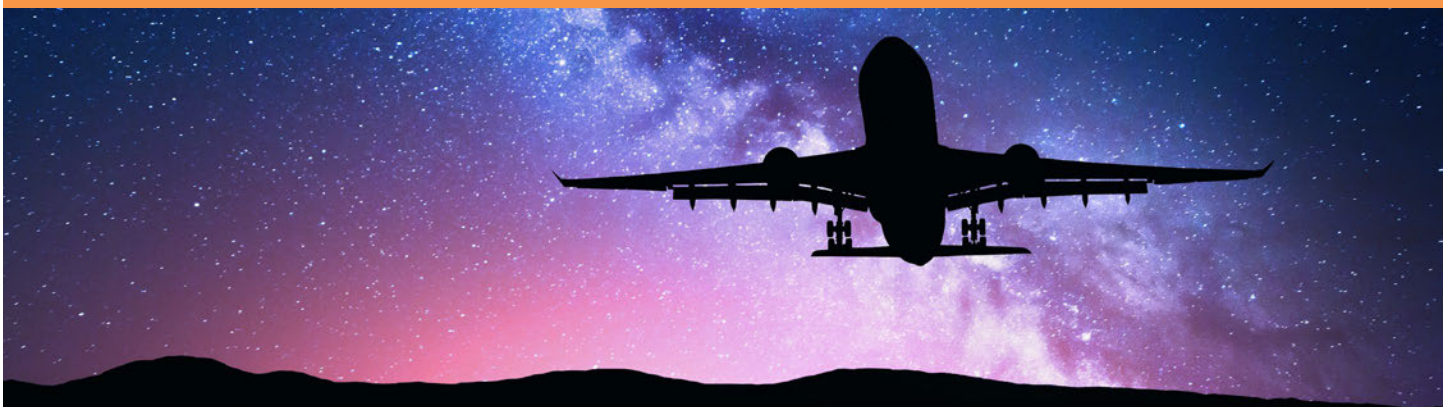
A.3 Application Checklists

B040/B055 Checklist *(Also, for adding a different MMS aircraft or not identically equipped to existing B040 or B055)*

Ensure all the applicable items have been completed.

- ☐ Attach your letter or email of request along with the completed sections and attached documents below for your PI.
- ☐ Section 2, Application Form,
- ☐ Section 3, Aircraft Eligibility Attachments,
- ☐ Section 4, Operational Attachments,
- ☐ Section 5, Training Attachments, and
- ☐ Section 6, Additional Attachments/Information.
- ☐ Attached files to this application guide and use the naming convention described in this appendix.
- ☐ Submit the completed application to the Flight Standards District Office in your region or send it to your principal inspector. Applications may be submitted electronically via email or through the FAA's Safety Assurance System (SAS) External Portal. For access to SAS external portal click ***Sign up for SAS*** under the login button.

  Note: Submissions using the Operations Approval (OAPS) functionality can be entered via the SAS Configuration [Module 1], in accordance with Order 8900.1, Volume 3, Chapter 1, Section 1.



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Appendix B

Appendix B: Definitions and Acronyms

B.1 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 (formerly known as "Random 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.

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).

Area of Magnetic Unreliability (AMU). For purposes of authorizations for certificated operators, the FAA designates the boundaries of the AMUs as follows:

- The Northern AMU is the area within 1,000 NM of the Magnetic North Pole but excludes Alaska and its territorial waters. In addition, Canadian Northern Domestic Airspace (NDA) is part of the Northern AMU. A
- The Southern AMU is the area within 1,000 NM of the Magnetic South Pole.
- As aircraft move towards the Earth's Magnetic North or South Pole, the horizontal field strength diminishes, and the ability of the compass to accurately sense Magnetic North is reduced. It is generally recognized that when the horizontal magnetic field strength falls below 6,000 nanotesla, the magnetic compass can no longer be considered reliable.

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 use of DME/DME positioning augmented by integration with an aircraft's inertial navigation system(s) to support RNAV or RNP operations. D/D/I can provide more flexibility and continuity than D/D positioning supporting continuous RNAV operations where gaps in DME facility availability exist or when GPS is lost (for any reason). Aircraft with advanced multi-sensor RNP capability often include a higher level of D/D/I capability through use of multiple DME facilities, integration with multiple inertial navigation systems and complex filtering (e.g., Kalman filtering). These aircraft can support continuous

RNAV and RNP operations when GPS is lost (for any reason).

F

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).

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.

O

One-Hour Reliable Fix (1HRF) Operations. Operations over land or over water where a reliable ground-based NAVAID fix is available at least once each hour.

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.

Polar Areas.

a. North Polar Area. The entire area north of 78º North latitude.

b. South Polar Area. The entire area south of 60º South latitude.

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.

Reliable Fix or Reliable Ground-Based NAVAID Fix. A “reliable fix” or “reliable ground-based NAVAID fix” means station passage of a VOR, VORTAC, or NDB. A reliable fix also includes a VOR/DME fix, an NDB/DME fix, a VOR intersection, an NDB intersection, and a VOR/NDB intersection provided course guidance is available from one of the facilities, and the fix lies within the designated Operational Service Volumes of any facilities which define the fix.

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 air traffic services 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 on board 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.

B.2 Acronyms

Acronym	Meaning
14 CFR	Title 14 of the Code of Federal Regulations
91K	Part 91 Subpart K
AFM	Airplane Flight Manual
AIP	Aeronautical Information Publication
AMU	Areas of Magnetic Unreliabiltiy
ATC	Air Traffic Control
ATS	Air Traffic Service (ATS)
CIS	Commonwealth of Independent States (CIS)
C-MNPS	Canadian Minimum Navigation Performance Specification Airspace
DME	Distance Measuring Equipment
ETOPS	Extended Operations
ETP	Equal Time Point
FAA	Federal Aviation Administration
FMS	Flight Management System
FQIS	Fuel Quantity Indicate System
FS	Flight Standards
GNSS	Global Navigation Satellite System
GOM	General Operations Manual
GPS	Global Positioning System
ICAO	International Civil Aviation Organization
IOM	International Operations Manual
LOA	Letter of Authorization
LODA	Letter of Deviation Authority
LRNS	Long Range Navigation System
MEL	Minimum Equipment List
MMEL	Master Minimum Equipment List
MMS	Make, Model, Series
MSpec	Management Specifications
NAT HLA	North Atlantic High Level Airspace
NAVAIDS	Navigational Aids
NDB	Non-directional beacon
NOTAMS	Notices to Airmen
OEI	One Engine Inoperative
OEM	Original Equipment Manufacturer
OpSpec	Operations Specifications
PAI	Principal Avionics Inspector
PI	Principal Inspector

Acronym	Meaning
PMI	Principal Maintenance Inspector
POI	Principal Operation Inspector
RAIM	Receiver Autonomous Integrity Monitoring
RNP	Required Navigation Performance
SATVOICE	Satellite Voice
VOR	Very High Frequency omnirange

Please Provide Feedback

In our continuing effort to improve the quality of service we provide to you, the Federal Aviation Administration would appreciate any feedback you may have on this guide and how we can improve it:

Please Indicate “Polar Operations & Operations in Areas of Magnetic Unreliability Application Guide” in the Subject Line

Mail to: 9-AWA-AVS-AFS-400-flight-technologies-procedures-division@faa.gov

Flight Technologies & Procedures Division