

**North Atlantic Operations and Airspace Manual**  
**V.2017-1 Edition Review, February 2016**  
Guy Gribble, General Manager, International Flight Resources, LLC

**Summary**

This document is developed by an ICAO committee called the NAT Systems Planning Group, NAT SPG and is the 7<sup>th</sup> publication of NAT Document #007. The countries participating in the NAT SPG are: Canada, Denmark, France , Iceland, Ireland, Norway, Portugal, United Kingdom and the United States. Industry advisory groups represented are: IATA, ICAO, IBAC, NAT CMA, and the NAT DMO.

Prior to 2010, the “NAT IGA Manual” dealt primarily with flights in the North Atlantic Region below turbojet levels, while the “NAT MNPS Handbook” concentrated on NAT MNPS Airspace (FL290-410 inclusive). Both of the documents are obsolete now. Since 2010, NAT Document #007 should be referenced for both IGA and Turbojet operations. Pilots MUST NOT fly within the NAT HLA, nor at flight levels 290 to 410 inclusive anywhere within the NAT Region, unless they are in possession of the appropriate operating approvals issued by the State of Registry or the State of the Operator.

Regulatory material relating to North Atlantic aircraft operations is contained in relevant ICAO Annexes, ICAO Document #4444, #7030, State AIPs and current NOTAMs should be read in conjunction with the material contained here. NAT Document #007 is the worldwide source for NAT crossing procedures but, it is not a sole source reference. For USA operators this means you will need to read and understand the procedures and notices above along with the specific requirements found in FAA’s AC 91-70B, NAT Resource Guide and the RNP Resource guide. After this study (and possible pilot training) then obtain the required OpsSpecs/LOAs

**Glossary of Terms**

An extensive glossary of terms is presented on pages XViii thru XXI

**Chapter 1**

**Operational Approval And Aircraft System Requirements For Flight In The Nat HLA**

*(\*\* Indicates information especially helpful to pilots/operators)*

- |                   |   |
|-------------------|---|
| Top of Page 28    | Note, from the very start, this emphasize the fact that operators required “State” approval cross the NAT.  |
| **Paragraph 1.1.1 | NAT HLA was designated 4FEB2016. Previous “MNPS” approvals based on something other than RNP(RNAV)-10 will expire 1JAN220.  |
| Paragraph 1.1.6   | 406Mhz are the ICAO standard since 2005.  |
| Paragraph 1.1.7   | Exceptions may be given to manned balloon flight and military operations  |
| Paragraph 1.2.1   | State approvals will include the navigation equipment used, together with its installation and maintenance procedures; plus the crew navigation procedures employed and the crew training requirements. |
| Paragraph 1.2.5   | State approvals for IGA operators, may be for a defined period of time  |
| **Paragraph 1.3.2 | Annex 6, Part 1 and 2 are referenced here and redundant LRNS are required. This needs to be read with 14CFR91.511, 135.165 and OpsSpec/LOA B050, B036.  |

- Paragraph 1.3.4 Explains why RNP(RNAV)-10 is different from RNP.
- \*\*Paragraph 1.3.5 Explains that INS, IRU, GNSS are the only sensors currently used and that at least two LRNS are required for NAT HLA operations.
- \*\*Paragraph 1.3.8 Explains what specific Initial skills training is required for crews to operate in the NAT HLA.
- \*\*Paragraph 1.3.9 Explains what specific Recurrent skills training is required for crews to operate in the NAT HLA.
- Paragraph 1.4.1 Explains SLRNS operations in the NAT HLA.
- Paragraph 1.4.2 Explains non-LRNS operations in the NAT HLA.
- Paragraph 1.5 Explains non-NAT approved operations in the NAT HLA.
- Paragraph 1.6 Explains non-RVSM approved operations in the NAT HLA.
- Paragraph 1.7.5 Explains the ADS-B functions required in the NAT HLA.
- Paragraph 1.9 Introduces compliance monitoring and performance surveillance in NAT HLA.
- \*\*Paragraph 1.10 Future developments are introduced and the NAT Data Link Mandate, NAT DLM is described.
- \*\*Paragraph 1.10.7 Performance Based Communication and Surveillance, PBCS is introduced.
- \*\*Paragraph 1.10.10 Reduced Lateral Separation Trials, RLatSM is described.
- Paragraph 1.10.10 Space based ADS-B is introduced.

## **Chapter 2, The Organized Track System, OTS**

*(\*\* Indicates information especially helpful to pilots/operators)*

- \*\*Paragraph 2.1.3 NAT OTS is not mandatory, about half of the total traffic uses them.
- \*\*Paragraph 2.2.1 Describes Gander and Shanwick's OTS construction responsibilities.
- Paragraph 2.2.4 Describes when the OTS messages are published and a customer service number for NAVCANADA is published here.
- Paragraph 2.2.6 Describes a split westbound track structure may be used when the Jetstream is strong and hindering traffic.
- \*\*Paragraph 2.3.3 Describes the Track Message Identification, TMI number and how it is derived.
- \*\*Paragraph 2.3.5 Describes the OTS validity period.
- Paragraph 2.3.7 Explains why not all available levels may be used in a track message.
- Paragraph 2.4.1 Explains the waiting period between track message publication.
- Paragraph 2.5 Examples of an OTS Track Message.

## **Chapter 3**

### **Other Routes And Route Structures Within Or Adjacent To The Nat HLA**

*(\*\* Indicates information especially helpful to pilots/operators)*

- \*\*Paragraph 3.2.1 "Blue Spruce", "Tango" and other routes inside NAT HLA introduced.
- \*\*Paragraph 3.3.1 North American Routes into NAT HLA introduced.
- Paragraph 3.3.3 FAA Designates specific routes from northeast USA into NAT HLA.
- \*\*Paragraph 3.3.5 Introduces the WATRS route system in the Western Atlantic.
- Paragraph 3.3.6 Describes the Shannon/Northern Oceanic Transition Areas, SOTA/NOTA.
- Paragraph 3.3.10 Describes the Brest Oceanic Transition Area, BOTA.
- Paragraph 3.3.14 Describes the Gander Oceanic Transition Area, GOTA.
- \*\*Paragraph 3.4 Graphic description of the HAT HLA airspace and nearby airspace.

## **Chapter 4, Flight Planning**

*(\*\* Indicates information especially helpful to pilots/operators)*

- \*\*Paragraph 4.1.4 Explains which route to use when planning into the NAT HLA.
- \*\*Paragraph 4.1.8 Describes the reasons for carrying the NAT OTS Track message onboard the aircraft.
- Paragraph 4.1.10 Explains its okay to plan step-climbs in NAT HLA.
- Paragraph 4.1.13 Defines “Random Routes”.
- Paragraph 4.1.14 Planners need to use the NAT Flight Level Allocation Scheme, FLAS found in Attachment 6.
- Paragraph 4.1.18 Planners need to properly indicate the equipment codes and operating approvals on the flight plan.
- Paragraph 4.1.20 Planners need to indicate the planned TAS/FL/Entry point into NAT HLA airspace in the route section (Block#15) of the flight plan.
- Paragraph 4.2.2 Planners are not to use OTS Track Letter Identifiers when planning to use only a portion of a track.
- Paragraph 4.2.7 Where planners need to include “Significant Points” for flights operating at or south of 70°N.
- Paragraph 4.2.8 Where planners need to include “Significant Points” for flights operating north of 70°N and at or south of 80°N
- Paragraph 4.2.9 Where planners need to include “Significant Points” for flights operating at or south of 80°N
- Paragraph 4.2.14 Explains how to use the NAR’s in flight planning.
- Paragraph 4.2.18 Explains HF radios are required when operating in the Shanwick OCA. This paragraph needs to be read with 14CFR 91.511.

## **Chapter 5, Oceanic ATC Clearances**

*(\*\* Indicates information especially helpful to pilots/operators)*

- \*\*Paragraph 5.1.1 Describes the three elements of an Oceanic ATC Clearance.
- \*\*Paragraph 5.1.2 Where Oceanic ATC Clearances are required in the NAT HLA and when to begin the clearance process.
- \*\*Paragraph 5.1.4 Describes the priority order of where to call for an Oceanic ATC.
- \*\*Paragraph 5.1.5 Defines where to call for an Oceanic ATC clearance on the ground before takeoff.
- \*\*Paragraph 5.1.7 Defines when to update and ETA with ATC. This needs to be read with to be read with ICAO Annex 2, Paragraph 3.6.2.2 and FAA Order 8900, Volume 7, Chapter 3, Paragraph 7-81, d.4.
- \*\*Paragraph 5.1.10 Explains that pilots are not to enter Shanwick OCA without an Oceanic ATC Clearance.
- \*\*Paragraph 5.1.11 Explains that pilots are not to leave a cleared FL without an ATC clearance just because the change is listed in the flight plan.
- \*\*Paragraph 5.2 Explains what pilots should expect when using voice procedures for Oceanic ATC clearances. This paragraph needs to be read with Attachment #7.
- Paragraph 5.4.1 Explains how the oceanic portion of your ATC clearance will connect to the North American, NAM region.
- Paragraph 5.6 Explains how the oceanic portion of your ATC clearance will connect to the North American, NAM region.

- Paragraph 5.6 Explains how the oceanic portion of your ATC clearance will be delivered to the cockpit when originating from the Caribbean and South American regions.
- Paragraph 5.7.5 Explains how to comply with a “Cruise Clearance” in the NAT HLA.
- Paragraph 5.7.6 Explains how to comply with a “Block Altitude” clearance in the NAT HLA.
- \*\*Paragraph 5.8.2 Explains “ATC Loop” Errors.
- \*\*Paragraph 5.8.3 Explains “Waypoint Insertion” Errors.

## **Chapter 6, Communications And Position Reporting Procedures**

*(\*\* Indicates information especially helpful to pilots/operators)*

- \*\*Paragraph 6.1.1 Explains the difference between a “Radio Operator” and an ATC Controller.
- Paragraph 6.1.5 Explains and defines the HF frequency families.
- Paragraph 6.1.7 Explains why stating the frequency in use is important when using HF.
- \*\*Paragraph 6.1.8 Explains the interaction and requirements of HF, CPDLC and SELCAL.
- \*\*Paragraph 6.1.9 Explains the interaction and requirements of HF and SATCOM Voice.
- Paragraph 6.1.12 Describes where to register new SELCAL addresses.
- Paragraph 6.1.14 Describes the difference between “Reykjavik Control” and “Iceland Radio”
- \*\*Paragraph 6.1.14 A good graphic of VHF and ADS-B coverage over Iceland and Greenland is just above this paragraph
- \*\*Paragraph 6.1.17 Describes SATCOM voice as a supplement not replacement to HF.
- Paragraph 6.1.17 Describes part of the voice comm required with an active CPDLC.
- \*\*Paragraph 6.1.26 Describes why a failure of FANS connectivity inflight will require an immediate notification to ATC.
- Paragraph 6.1.26 Defines air-to-air common frequency and its uses.
- \*\*Paragraph 6.3.4 Defines when to update and ETA with ATC. This needs to be read with to be read with ICAO Annex 2, Paragraph 3.6.2.2 and FAA Order 8900, Volume 7, Chapter 3, Paragraph 7-81.
- Paragraph 6.3.8 Explains why stating the frequency in use is important when using HF.
- Paragraph 6.3.10 Voice communication examples described here.
- Paragraph 6.3.11 Describes voice communication that “copies” the neighboring OCA.
- Paragraph 6.4.2 Example of a voice communication that uses “When Able Higher”
- Paragraph 6.5.1 Explains that routine metrological reports have not been required since 2010.
- Paragraph 6.6.2 Explains that “Lost Comm” in NAT HLA may be the result of a HF Blackout.
- \*\*Paragraph 6.6.5 Explains NAT HLA “Lost Comm” procedures in general terms.
- Paragraph 6.6.9 Explains SATCOM Voice is usually unaffected by Space Weather.
- Paragraph 6.6.19 Explains that “Lost Comm” in NAT HLA, pilots should remain at the cleared oceanic altitude vice reverting to planned altitudes/FL
- Paragraph 6.6.21 Explains that “Lost Comm” in NAT HLA, without an oceanic clearance, pilots may enter NAT HLA and should then remain at the planned oceanic altitude and speed.
- Paragraph 6.6.25 Explains that “Lost Comm” in NAT HLA, due to HF Blackout without an oceanic clearance, pilots may enter NAT HLA and should then remain at the planned oceanic altitude and speed.
- \*\*Paragraph 6.6.25 Describes in summary “Lost Comm” in NAT HLA.
- \*\*Paragraph 6.8 Describes when to set 2000 in your transponder 30mins after NAT HLA entry.
- \*\*Paragraph 6.9 Explains the TCAS and System 7.1 requirement for NAT HLA Operations.

## **Chapter 7, Application Of Mach Number Technique**

*(\*\* Indicates information especially helpful to pilots/operators)*

- \*\*Paragraph 7.2 Explains why holding a True Mach Number as assigned is important.
- \*\*Paragraph 7.3.4 Explains that a True Mach Number as assigned is +/- 0.
- \*\*Paragraph 7.3.4 Describes that a different True Mach Number may be assigned upon exit from NAT HLA.

## **Chapter 8, NAT HLA/MNPS Flight Operation & Navigation Procedures**

*(\*\* Indicates information especially helpful to pilots/operators)*

- Paragraph 8.1.3 Explains how RNP-10 became RNP(RNAV)-10 and why that is important.
- \*\*Paragraph 8.1.3 Explains where to find more information about Performance Based Communication and Surveillance, PBCS in the NAT Region.
- \*\*Paragraph 8.1.6 Defines a Gross Navigation Error in the NAT HLA. This needs to be read with FAA Order 8900, Volume 7, Chapter 3, Paragraph 7-81.
- Paragraph 8.1.8 Describes that about half the NAT HLA traffic is on an OTS.
- \*\*Paragraph 8.2.1 Describes how to set-up information presented on a flight plan and plotting chart.
- \*\*Paragraph 8.2.2 Describes where to find an approved source of timing calibration.
- \*\*Paragraph 8.2.6 Describes why a Master Document is important.
- \*\*Paragraph 8.2.7 Explains the symbols to be used on a Master Document.
- \*\*Paragraph 8.2.10 Explains why a Plotting chart is important.
- \*\*Paragraph 8.2.11 Explains why a Plotting chart is important.
- Paragraph 8.2.13 Explains, which Plotting charts to use.
- Paragraph 8.2.14 Explains how ATC will "Tactically" approve Step-Climbs.
- \*\*Paragraph 8.3.3 Explains how easy it is to mix-up initial position entry when near the Equator or Prime Meridian.
- Paragraph 8.3.4 Describes why it takes longer to align an INS/IRU at high latitudes.
- Paragraph 8.3.10 Explains why a RAIM/FDE predication is not needed with IRU/INS onboard.
- \*\*Paragraph 8.3.12 Describes maximum RAIM/FDE outages allowed in NAT HLA.
- \*\*Paragraph 8.3.17 Describes the "Route and Legs" check preformed before leaving the ramp.
- \*\*Paragraph 8.4.3 Describes why independent crosschecking is important.
- \*\*Paragraph 8.4.7 Explains what is expected from a crew when receiving an amended clearance or re-route.
- Paragraph 8.4.13 SLOP is introduced as part of the "Normal" procedures upon entering NAT
- \*\*Paragraph 8.4.14 Describes the waypoint crossing procedures expected from pilots in NAT HLA. This needs to be read with Paragraph 8.2.7.
- \*\*Paragraph 8.4.20 When "Normal" position plotting should be done.
- \*\*Paragraph 8.4.23 What is expected of pilots when exiting the NAT HLA.
- \*\*Paragraph 8.5 Strategic Lateral Offset Procedures, SLOP is described and it's use explained.
- Paragraph 8.5 Describes End of Flight Accuracy checks.
- Paragraph 8.7 Explains what the NAT Central Monitoring Agency is monitoring.

## **Chapter 9, RVSM Flight In The NAT HLA**

*(\*\* Indicates information especially helpful to pilots/operators)*

Paragraph 9.1.3 Turbulence and Mountain Waves effect on NAT traffic.

\*\*Paragraph 9.1.5 Explains what pre-flight actions are expected of pilots operating inside RVSM in the NAT Region.

\*\*Paragraph 9.1.10 Explains what actions are expected of pilots before entering RVSM in the NAT Region.

\*\*Paragraph 9.1.12 Explains the maximum altimeter differences while operating inside RVSM in the NAT Region.

## **Chapter 10, ATS Surveillance Services In The NAT HLA**

*(\*\* Indicates information especially helpful to pilots/operators)*

Paragraph 10.2.1 Explains transponder usage in NAT HLA and specifically on “Tango” routes.

## **Chapter 11, Monitoring of Aircraft Systems And Crew Performance**

*(\*\* Indicates information especially helpful to pilots/operators)*

Paragraph 11.1.1 Explains why performance monitoring is done

\*\*Paragraph 11.2.2 Describes what crews are expected to report when a deviation occurs. This needs to be read with Attachment #1.

\*\*Paragraph 11.3.4 Explains what kind of turbulence crews are expected to report.

Paragraph 11.3.7 Explains Height Monitoring requirements in RVSM and NAT HLA airspace.

Paragraph 11.3.7 Explains TCAS RA reporting requirements in NAT HLA airspace.

\*\*Paragraph 11.7.11 Describes what is done with the deviation reports from inside NAT HLA airspace.

\*\*Paragraph 11.7.12 Describes what is done with the deviation reports from outside NAT HLA airspace.

\*\*Paragraph 11.7.15 Describes what ATC reports to the NAT CMA.

## **Chapter 12, Procedures In The Event Of Navigation System Degradation Or Failure**

*(\*\* Indicates information especially helpful to pilots/operators)*

Paragraph 12.1.2 Explains that 2 Long-Range Navigation units is the standard requirement for NAT HLA.

\*\*Paragraph 12.1.6 Describes methods to use in determining what LRNS is faulty.

\*\*Paragraph 12.1.8 Guidance on faulty INS/IRU LRNS.

\*\*Paragraph 12.1.11 Guidance on faulty GPS LRNS.

Paragraph 12.1.11 Describes the “Blue Spruce” routing.

\*\*Paragraph 12.2.9 Describes probable actions in the case of a total LRNS failure.

## **Chapter 13, Special Procedures For In-Flight Contingencies**

*(\*\* Indicates information especially helpful to pilots/operators)*

Paragraph 13.2.1 Explains the difference between “PAN,PAN” and “MAYDAY,MAYDAY,MAYDAY”

\*\*Paragraph 13.2.3 Describes the interaction between ICAO #444, #7030 and state AIPs in contingency operations.

\*\*Paragraph 13.3 Describes the “General Oceanic Contingency” and specifics for NAT HLA operation.

\*\*Paragraph 13.4 Describes the “Weather Deviation Contingency” and specifics for NAT HLA operation.

- Paragraph 13.4 Describes using SLOP for wake turbulence avoidance. This needs to be read with Paragraph 8.5
- \*\*Paragraph 13.6.4 Describes why GPS climb/descend thru procedures may give a RA warning.
- \*\*Paragraph 13.6.5 Describes why conditional clearances may give a RA warning.
- \*\*Paragraph 13.6.5 Describes why ATC's use of ADS-C may give a RA warning.

## **Chapter 14, Check Lists For Pilots Operating in the NAT HLA**

*(\*\* Indicates information especially helpful to pilots/operators)*

- \*\*Paragraph 14.2. Explains planning items especially for NAT HLA Operations
- \*\*Paragraph 14.3 Describes when to find generally accepted checklist for operational procedures to be used by pilots operation in the NAT HLA.

## **Chapter 15, Guarding Against Complacency**

*(\*\* Indicates information especially helpful to pilots/operators)*

- \*\*Paragraph 15.1.3 Explains where to find informational bulletins for NAT HLA Operations
- \*\*Paragraph 15.1.4 Explains where to find the pilot training DVD "Trackwise, Targeting Risk in the Shanwick OCA" covering operational procedures to be used by pilots operation in the NAT HLA.
- Paragraph 15.1.3 Describes the causes of most common Height Errors.
- Paragraph 15.3.1 Describes the causes of most Lateral Navigation Errors.
- \*\*Paragraph 15.3.1 Describes lessons learned on how to avoid common errors in NAT HLA.

## **Chapter 16,**

### **The Prevention Of Deviations From Track As A Result Of Waypoint Insertion Errors**

*(\*\* Indicates information especially helpful to pilots/operators)*

- Paragraph 16.1.1 General summary of operational errors found in NAT HLA.
- \*\*Paragraph 16.2.2 Explains best practices for pilot operational procedures in NAT HLA.

## **Chapter 17, Guidance For Dispatchers**

*(\*\* Indicates information especially helpful to pilots/operators)*

- Paragraph 17.1.2 General summary of NAT HLA boundaries.
- Paragraph 17.2.6 Explains routing options for aircraft that are not NAT HLA compliant.
- Paragraph 17.4 Explains the Flight Level Allocation Scheme in NAT HLA. This should be read with Attachment #6.
- Paragraph 17.4.2 Explains that planning for ECON or LRC speeds in NAT HLA is not practicable.
- Paragraph 17.5 Explains how to complete the ICAO flight plan form IAW Amendment #1 to ICAO Document #4444.
- Paragraph 17.6.7 Explains OTS Routing options for aircraft that are NAT HLA compliant.
- Paragraph 17.6.9 Explains Random Routing options for aircraft that are NAT HLA compliant.
- Paragraph 17.6.20 Explains that ETOPS and EDTO are interchangeable terms

## **Chapter 18, Flight Operations Below the NAT HLA**

*(\*\* Indicates information especially helpful to pilots/operators)*

- Paragraph 18.1 General description that much of the old "NAT IGA" manual information is now located in this chapter.
- Paragraph 18.3.5 Explains that without an instrument rating, NAT flying options are very limited.

- \*\*Paragraph 18.4.3 Explains that a temporary registration certificate is not valid for international operations.
- \*\*Paragraph 18.4.7 Explains why SATCOM Voice is not a universal replacement for HF.
- \*\*Paragraph 18.4.14 Explains why the carriage and use of overwater survival gear.
- \*\*Paragraph 18.4.14 Explains why the carriage and use of overland survival gear.
- Paragraph 18.13 Explains SAR expectations and procedures for the NAT region.
- \*\*Paragraph 18.14 Describes a light GA NAT region planning checklist.

### **Attachment 1, Sample of Error Investigation Form**

*(\*\* Indicates information especially helpful to pilots/operators)*

*For pilots and/or operations general information gathering use after a deviation. Address for deliver is listed in the introduction section.*

### **Attachment 2, Altitude Deviation Report Form**

*(\*\* Indicates information especially helpful to pilots/operators)*

*\*\*Message format for a report to the Central Monitoring Agency of an altitude deviation of 300 ft or more, including those due to TCAS RA advisories, turbulence and contingency events. Address for deliver is listed near the bottom of the form.*

### **Attachment 3, Wake Turbulence Report Form**

*For use by pilots involved in Wake Vortex incidents which have occurred in the NAT HLA. Address for deliver is listed near the bottom of the form.*

### **Attachment 4, ICAO Flight Plan Completion for a NAT Flight**

*Specific instruction for completing the ICAO flight plan form. This provides details for NAT operators that are compliant with ICAO Document #4444.*

### **Attachment 5, VHF Air/Ground Communications Coverage Existing in the NAT Region**

*Contains maps that display the theoretical VHF communications coverage in the NAT region.*

### **Attachment 6, North Atlantic Flight Level Allocation Scheme**

*Detailed instructions for selection and tactical assignment of flight levels within the NAT Region.*

### **Attachment 7, Oceanic Clearances Delivery/Format/Content**

*(\*\* Indicates information especially helpful to pilots/operators)*

*\*\*Detailed instructions for obtaining and formatting of NAT Oceanic Clearances with specific examples of voice communication.*

### **Attachment 8, Weather Conditions & Considerations**

*(\*\* Indicates information especially helpful to pilots/operators)*

*\*\*Good overview of the NAT region's peculiar weather changes and expected seasonal weather systems.*

### **Attachment 9, North Atlantic ATS Surveillance Coverage Charts**

*(\*\* Indicates information especially helpful to pilots/operators)*

*\*\* Contains maps that display the expected ADS-B or SSR coverage in the NAT region.*

### **Attachment 10, Bibliography And Other Reference Material**

*(\*\* Indicates information especially helpful to pilots/operators)*

*\*\* Contains an excellent listing of references and weblinks to download copies of NAT reference material.*