GOVERNMENT OF INDIA
OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION
TECHNICAL CENTRE, OPP SAFDARJUNG AIRPORT, NEW DELHI

CIVIL AVIATION REQUIREMENTS
SECTION 8 – AIRCRAFT OPERATIONS
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SUBJECT: REQUIREMENTS FOR OPERATION OF AIRCRAFT IN NORTH ATLANTIC HIGH LEVEL AIRSPACE (NAT HLA)

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1. INTRODUCTION

1.1 Sub rule 3 of Rule 9 and Rule 57 of the Aircraft Rules, 1937 stipulate that every airplane shall be fitted with instrument and equipment, including radio apparatus and special equipment, as may be specified according to the use and circumstances under which the flight is to be conducted.

1.2. In accordance with the NAT HLA to PBN Transition Plan for the ICAO North Atlantic Region, with effect from 04 February 2016 that airspace formerly known as the "North Atlantic Minimum Navigational Specifications Airspace" (MNPSA), but excluding the BOTA (Brest Oceanic Transition Area) and SOTA (Shannon Oceanic Transition Area) areas and with the addition of the BODO Oceanic FIR (FL285-420 inclusive), is re-designated as the **"North Atlantic High Level Airspace" (NAT HLA).** However, recognizing that ICAO Annex 6 allows for a "minimum navigation performance specification" to be regionally specified in Regional Supplementary Procedures Doc 7030, it has been determined to maintain reference to a "MNPS" in the NAT Region within NAT Doc 7030 and in the guidance material (Doc 007), within particular contexts. Thus, approvals initially issued to operate in the NAT MNPSA are referred to as "NAT MNPS" approvals and approvals issued to operate in the NAT HLA are referred to as "NAT HLA MNPS" approvals. Otherwise, except in respect of historical references, from Edition 2016 of this document (NAT Doc.007) and subsequently, previous references to "Minimum Navigation Performance Specifications" and "MNPS" are replaced by "North Atlantic High Level Airspace Specifications" and "NAT HLA". NAT HLA. Approvals granted prior to this (04 Feb 2016) change will continue to be valid for NAT HLA operations. However, those issued prior to 01

January 2015 and based on the "6.3 NM" NAT HLA standard will no longer be accepted beyond January 2020.

1.3. The CAR lays down the requirements concerning operations and airworthiness approval of navigation equipment in NAT HLA Airspace. The requirements stipulated in this CAR must be complied with by operators intending to operate their airplanes in NAT HLA airspace.

1.4. The CAR is consistent with Sub rule 3 of Rule 9, Rule 57 of the Aircraft Rules 1937 and is issued under the provisions of Rule 133A of the Aircraft Rules, 1937 for information, guidance and compliance by the concerned commercial and general aviation operators operating to, through and within the NAT HLA airspace. The contents of this CAR are consistent with the provisions of ICAO Annex 6, ICAO Doc 4444 and ICAO Doc 7030 on the subject.

2. NAT HLA AIRSPACE:

2.1 A large portion of the airspace of the North Atlantic Region, through which the majority of these North Atlantic crossings route between FLs 285 and 420 inclusive, is designated as the NAT High Level Airspace (NAT HLA). Within this airspace a formal Approval Process by the State of Registry of the aircraft or the State of the Operator ensures that aircraft meet defined NAT HLA Standards and that appropriate crew procedures and training have been adopted. The lateral dimensions of the NAT HLA airspace include the following Control Areas (CTAs):

REYKJAVIK, SHANWICK (excluding SOTA & BOTA), GANDER, SANTA MARIA OCEANIC, BODO OCEANIC and the portion of NEW YORK OCEANIC EAST which is north of 27°N.

2.2 The main reference document for operations in NAT HLA is NAT Doc 007 - Guidance concerning Air Navigation in and above the NAT HLA which is required to be complied by all operators in this airspace.

3. GENERAL REQUIREMENTS:

3.1 No person or operator shall operate Indian registered aircraft in air space designated as NAT HLA unless:

(a) The operator is authorised by DGCA to perform such operations.

(b) The aircraft has approved navigation performance capability to maintain within the requirements laid down for NAT HLA in NAT Doc 007 - Guidance concerning Air Navigation in and above the NAT HLA (latest edition).

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(c) The crew have been trained for NAT HLA and RVSM operations.

3.2 Presently NAT HLA requirements are applicable in the North Atlantic Airspace (NAT). However, NAT HLA requirements may be imposed in any other airspace by the ATS providers. Specifications may not be exactly similar to that of NAT HLA. To meet, the accuracy requirements for navigation in the particular NAT HLA Airspace, appropriate equipment shall be installed for such operations. Individual approval is required for each aircraft and the operator to operate in each NAT HLA airspace as and when such areas are notified and operator wishes to operate in such airspace.

3.3 Special arrangements for the penetration of NAT HLA airspace by non-NAT HLA approved aircraft in accordance with NAT Doc 007 (latest version).

3.4 Special arrangements for the penetration of NAT HLA airspace by non-RVSM approved aircraft in accordance with NAT Doc 007 (latest version).

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4. HORIZONTAL NAVIGATION REQUIREMENTS FOR UNRESTRICTED MNPS AIRSPACE OPERATIONS

4.1 Longitudinal Navigation

Longitudinal separation between subsequent aircraft following the same track(in-trail) and between aircraft on intersecting tracks in the NAT HLA are assessed in terms of differences in ATAs/ETAs at common waypoints. The longitudinal separation minima currently used in the NAT HLA are thus expressed in clock minutes. The pre-flight procedures for any NAT HLA operation must include a UTC time check and resynchronization of the Master Clock (typically the FMS). List of acceptable time sources for this purpose have been promulgated by NAT ATS provider states.

4.2 Lateral Navigation

4.2.1 For aircraft which is approved for operations within NAT MNPS/HLA Airspace prior to January 2015, shall have a navigation performance capability such that:

(a) the standard deviation of lateral track errors shall be less than 6.3 NM (11.7 km);

(b) the proportion of total flight time spent by the aircraft 30 NM (56 km) or more off the cleared track shall be less than 5.3 x 10-4;

(c) the proportion of total flight time spent by the aircraft between 50 and 70 NM (93 and 130 km) off the cleared track shall be less than 13 x 10-5.

(d) Such navigation performance capability shall be verified by the State of Registry or the State of the aircraft operator.

4.2.2 For approvals issued after January 2015, the navigation system accuracy requirements for NAT MNPSA/HLA operation should only be based on the PBN specifications, RNP 10 (PBN application of RNAV 10) or RNP 4. Although when granting consequent approval for operations in MNPS/NAT HLA airspace, RNP 10 time limits for aircraft equipped with dual INS or inertial reference unit (IRU) systems will be considered by DGCA.

4.2.3 Additionally, in order for the 50 Nms lateral separation minimum to be utilized in the New York Oceanic East the following navigation performance criteria must also be met by aircraft with RNAV 10 (RNP 10) Approvals: -

(a) the proportion of the total flight time spent by aircraft 46 km (25 NM) or more off the cleared track shall be less than 9.11 × 10-5; and

(b) the proportion of the total flight time spent by aircraft between 74 and 111 km (40 and 60 NM) off the cleared track shall be less than 1.68 × 10-5.

And similarly the additional criteria which must be met by aircraft approved as RNP 4 are as follows : -

(c) the proportion of the total flight time spent by aircraft 28 km (15 NM) or more off the cleared track shall be less than 5.44 × 10-5; and

(d) the proportion of the total flight time spent by aircraft between 44 and 67 km (24 and 36 NM) off the cleared track shall be less than 1.01 × 10-5.

Note: In December 2015 the first phase of North Atlantic trials of reducing the lateral separation minimum to 25 NM was commenced. In this "RLatSM" Phase 1 (reduced lateral separation minima), 25 NM lateral separation is implemented by establishing ½ degree spacing between two specified core OTS tracks and a central track, within the vertical limits applicable to the airspace associated with the NAT Region Data Link Mandate. Only aircraft with the appropriate Required Navigation Performance (RNP4) approval and operating Automatic Dependent Surveillance-Contract (ADS-C) and Controller Pilot Data Link Communications (CPDLC), are permitted to operate on these ½ degree spaced tracks. Special procedures in respect of planning and operating on these tracks have been

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development and promulgated via the AIS of the participating States i.e. Canada, Iceland and the United Kingdom. Operators intending to participate in these trials will need to ensure that advanced appropriate pilot and dispatcher training is undertaken.

4.2.4 Furthermore, when granting approval for operations in NAT HLA airspace on the basis of PBN navigational standards, States of Registry should also ensure that in-flight operating drills are approved which include mandatory navigation cross-checking procedures aimed at identifying navigation errors in sufficient time to prevent the aircraft inadvertently deviating from the ATC-cleared route.

Note:- In Summary : - From February 2016 the NAT MNPSA is re-designated as NAT HLA. Previously granted MNPS Approvals are valid for NAT HLA operations. Milestone 2 of the MNPS to PBN NAT transition plan was achieved in January 2015. From that date all ***new*** *North Atlantic MNPS Operational Approvals should have been based upon RNAV 10 (RNP 10) or RNP 4 navigation specifications. Previously issued 6.3NM based MNPS Approvals will continue to be valid for NAT HLA operations but it is important to note that their longevity will be limited. Since subsequently, from January 2020, Milestone 4 of the MNPS to PBN NAT Transition Plan will take effect and the NAT HLA airspace will be re-designated for "PBN Based Operations" and thus from then Aircraft Approvals based on the earlier 6.3NM MNPS standard will no longer be valid.*

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5. AIRCRAFT SYSTEM/EQUIPMENT REQUIREMENTS:

In order to consider each aircraft for unrestricted operation in the NAT HLA DGCA approval may presently be granted to an aircraft equipped as follows:

(a) with at least two fully serviceable Long Range Navigation Systems (LRNSs). A LRNS may be one of the following:

- one Inertial Navigation System (INS);
- one Global Navigation Satellite System (GNSS); or
- one navigation system using the inputs from one or more Inertial Reference System (IRS) or any other sensor system complying with the NAT HLA requirement.

Note 1: Currently the only GNSS system fully operational and for which approval material is available, is GPS.

Note 2: A GPS installation must be approved as follows:

If the two required LRNSs are both GPS, they must be approved in accordance with the current version of FAA Advisory Circular AC-20-138D Appendix 1. AC- 20-138 requires that GPS systems used in Oceanic airspace must have a FDE function. States other than the USA may set their own standards for operational approval of GPS to provide Primary Means of Navigation in Oceanic and remote areas but in all cases these approvals will include the requirement to carry out Pre-Departure Satellite Navigation Prediction Programs (See Chapter 8 - *GNSS (GPS) Systems for further details). If, however, GPS serves as only one of the two required LRNSs, then it must be approved in accordance with FAA TSO- C129 or later standard as Class A1, A2, B1, B2, C1 or C2, or with equivalent European Aviation Safety Programme (EASA) documentation ETSO-C129a. In this instance individual States vary in their insistence upon the need for the conduct of pre-departure satellite navigation prediction programs (viz.FDE /RAIM).*

Note 3: Currently equivalent approval material for GLONASS is not under development but it will need to be available prior to approval of any GLONASS equipped aircraft for NAT HLA operations.

(b) each LRNS must be capable of providing to the flight crew a continuous indication of the aircraft position relative to desired track.

(c) it is also highly desirable that the navigation system employed for the provision of steering guidance is capable of being coupled to the autopilot.

Note : Some aircraft may carry two independent LRNS but only one FMCS. Such an arrangement may meet track keeping parameters but does not provide the required redundancy (in terms of continuous indication of position relative to track or of automatic steering guidance) should the FMCS fail; therefore, in order to obtain NAT HLA certification, dual FMCS is required to be carried. For example: a single INS is considered to be one LRNS; and an FMCS with inputs from one or more IRS/ISS is also considered to be a single LRNS.

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(d) Since MNPS Airspace is now designated as RVSM airspace at all levels (i.e. FL 290-410 inclusive) **specific State RVSM Approval is also required to operate within NAT HLA**. RVSM approvals prescribe both airworthiness requirements to ensure aircraft height-keeping performance in accordance with the RVSM Minimum Aircraft System Performance Specification (MASPS), and also crew operating procedures.

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(e) Aircraft operating in RVSM Airspace are required to be compliant with the altimetry MASPS and hold an issued approval. RVSM operations are required to be conducted in MNPS airspace and the following additional equipment shall also be installed.

i) Two fully serviceable independent primary altitude measurement systems;
ii) One automatic altitude-control system;
iii) One altitude-alerting device; and
iv) A functioning Mode-C SSR Transponder.
v) ADS-C and CPDLC (for RLatSM)

(f) Carriage of standby navigation equipment shall be governed by ICAO Annex 6 Part I and Part II – Chapter 7

(g) Any other equipment which meets MNPSA accuracy criteria and is acceptable to DGCA may be installed.

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6. OPERATIONAL REQUIREMENT:

6.1 Each operator shall develop NAT HLA operational procedures in accordance with NAT Doc 007 - Guidance concerning Air Navigation in and above the NAT HLA (latest version).

6.2 Each operator shall have a system of evaluation and recording Inertial Navigation System radial errors and ensure that such defects when reported are duly rectified.

7. TRAINING REQUIREMENTS

7.1 Introduction

7.1.1 The operating crew shall be adequately trained and kept proficient for operation of aircraft in NAT HLA and shall be fully aware of the procedures to be followed. During operations in NAT HLA if there is any failure, the pilot shall inform the concerned ATC immediately and comply with their instructions. Operators shall ensure that appropriate guidance is provided to all flight dispatchers in accordance with NAT Doc 007 (latest version).

7.1.2 All initial NAT HLA training courses must be approved by the FSD, DGCA prior to use and the syllabus incorporated in the Operations Manual. Recurrent training is required on an annual basis. The following items detailed below should be standardized and incorporated into training programmes and operating practices and procedures.

7.2 **Flight Crew Training**

The following items should be included in flight crew training (initial and recurrent) programmes:

(a) Knowledge, understanding and compliance of standard ATC phraseology and track messages used in each area of operations;

(b) MNPS procedures for NAT (and other areas when applicable)

(c) Changes to charting and documents to reflect MNPS.

(d) Navigation equipment required to be operational for flight in designated MNPS airspace, limitations associated with the RNAV equipment;

(e) Flight planning requirements;

(f) Entry, in-flight and exit requirements and procedures

(g) Contingency procedures for system failures or navigation inaccuracies

(h) Position error log and notification requirements;

(i) Operations Manual information and procedures

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8. MAINTENANCE REQUIREMENTS:

8.1 All equipment/systems pertaining to NAT HLA shall be maintained in accordance with the manufacturers approved maintenance program.

8.2 Aircraft Maintenance Engineers(AME) shall scrutinize the Flight Reports for pilot reported Inertial Navigation System radial errors or failures and ensure that such defects are promptly rectified.

9. MINIMUM EQUIPMENT LIST (MEL)

Each operator shall reflect requirements of minimum navigation systems for NAT HLA in their MEL.

10. VALIDATION FLIGHT(S)

The contents of the NAT HLA application and programmes may be sufficient to validate the aircraft. However, the final step of the approval process may require a validation flight through NAT HLA by a DGCA Flight Operations Inspector to verify that all relevant procedures are applied effectively. If the performance is satisfactory, operational approval for NAT HLA may be granted.

11. APPROVAL

Approval to operate in NAT HLA will be granted as by inclusion in the AOC/AOP issued by the DGCA for commercial operators and a Letter of Authorisation for General Aviation operators. Each aircraft for which the operator is granted authority will be listed.

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