



GOVERNMENT OF INDIA
CIVIL AVIATION DEPARTMENT
DIRECTOR GENERAL OF CIVIL AVIATION

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OPERATIONS CIRCULAR

Subject: POLAR OPERATIONS

1. INTRODUCTION

This Operations Circular provides policy and guidance material for operators, who propose to conduct flight operations into and across the polar areas of the globe North of 78° N latitude or south of 60°S latitude and designated as the “North” and “South Polar Regions” respectively.

The new cross-polar routes connect eastern and interior regions of North America to Asian cities via the North Polar Region. These shortcuts make service to existing city pairs more efficient through reduced fuel consumption and associated emissions.

The purpose of this Operations Circular is to highlight the important operational aspects, which are relevant to safe flight operations in Polar areas, and to provide guidance to operators to deal with these peculiarities to ensure safe and efficient conduct of operations.

2. APPLICABILITY

This Operations Circular is applicable to all Scheduled operators in India. Operators planning to operate into, or on routes crossing, the designated Polar Regions should comply with the contents of this operations circular.

3. RELATED REFERENCES

FAA “Guidance for Polar Operations” March 5, 2001
FAA Advisory Circular AC120-42B on ETOPS and Polar Operations -
Boeing “Aero 16- Polar Routes”

4. ABBREVIATIONS

AED	–	Automated External Defibrillator
AOC/AOP	–	Air Operator Certificate/Permit
APU	–	Auxiliary Power Unit
ASOA	–	Airport Safety and Operational Assessment (from Boeing)
ETOPS	–	Extended Twin-engine Operational Performance Standards
ETP	–	Equal Time Point
FMS	–	Flight Management System • FOIL
GPS	–	Global Positioning System
HF	–	High Frequency Radio
MEL	–	Minimum Equipment list
PNR	–	Point of No Return
Polar Region	–	North of 78° north latitude or south of 60° south latitude and designated as the “North” and “South Polar Regions” respectively.
QFE	–	the Q-code for: Atmospheric pressure at an Aerodrome elevation (or at RWY threshold)
QNH	–	the Q-code for Altimeter sub-scale setting to obtain elevation when on the ground, i.e. altitude above MSL.
SATCOM	–	Satellite Communication
SLR	–	Specific Long Range
ULR	–	Ultra Long Range
VHF	–	Very High Frequency Radio

5. POLAR OPERATIONS REQUIREMENTS

In order for an operator to apply for approval to operate into the Polar Regions, a route study must be completed to define the requirement for trans-polar flight routes. The operator applying for authority to fly in the Polar Areas must develop plans in preparation for all polar flights in the North and/or South Polar Areas, as appropriate.

The operator’s plan for conducting operations within these areas must include the following elements:

5.1 DESIGNATION OF EN ROUTE ALTERNATE AIRPORTS

- (a) An operator should designate a set of alternate airports, regardless of their distance from the planned route, such that one or more can reasonably be expected to be available in a variety of weather conditions, to support a diversion.
- (b) The aeroplane must be able to make a safe landing and manoeuvre off the runway at the selected diversion airport. The airport must also have capability to remove disabled aeroplane following landing, so as not to block the operation of a recovery aircraft.

- (c) In addition, these designated airports should be capable of protecting the safety of all personnel by being able to:
- (i) deplane the passengers and crew in a safe manner during possible adverse weather conditions;
 - (ii) provide for the physiological needs of passengers and crew for the duration of the stay until safely evacuated, and
 - (iii) safely and expeditiously extract passengers and crew.

Note: A time frame of 12 to 48 hours for execution and completion of a recovery is considered acceptable

5.2 IN-FLIGHT DIVERSION

An in-flight diversion within the Polar Region should take into account remoteness of the region, weather conditions as well as limited supporting facilities. In this regard the operator should develop appropriate procedures and processes to facilitate decision-making for in-flight diversion.

Apart from engine failure, an in-flight decision to divert could be caused by events including but not limited to:

- (a) Medical alerts;
- (b) Depressurisation;
- (c) Hydraulic failure; and
- (d) Smoke warning in cargo-hold, in-flight entertainment system or Avionics.
- (e) Guidelines on medical emergencies, especially when no medical personnel are found on board, must be provided.

5.3 PASSENGER RECOVERY

5.3.1 All operators must have a DGCA-approved recovery plan for unplanned diversions. The recovery plan should address the care and safety of passengers and crew at the diversion airport and provide a plan to transport passengers and crew from that airport. Operators should be able to demonstrate their ability to launch and conduct the recovery plan on their initial applications for polar route approval.

5.3.2 Operators must maintain the accuracy and completeness of their recovery plans as part of their annual audits.

5.4 FUEL FREEZE STRATEGY AND MONITORING

- 5.4.1 During long flight duration in very cold air mass, the fuel temperature could potentially approach freezing point. The Operator must have a fuel freeze strategy and procedures for monitoring fuel freezing.
- 5.4.2 The Operator should have procedures established that require coordination between maintenance, dispatch, and assigned flight crewmembers to convey the determined fuel freeze temperature of the fuel load on board the airplane.

5.5 NAVIGATION

- 5.5.1 Operators are to provide information and procedures with regard to the use of Magnetic and True directional references for navigation through the area of magnetic unreliability (AMU) and near or over the True Geographical Pole.
- 5.5.2 In the polar region, magnetic heading is unreliable or totally useless for navigation. Magnetic variations typically are extreme, often are not constant at the same point, and change rapidly as an airplane changes position. Flight crews must ensure that the computer flight plan shows true tracks and headings. It is important to note that areas unmapped for enhanced ground proximity warnings systems (i.e., those areas beyond the limits of the terrain database) are displayed as magenta dots on the map display, regardless of airplane altitude.

5.6 COMMUNICATION

The Operator must have effective voice communications and/or data link capability for all portions of the flight route.

The communication requirements as applicable to EDTO shall also be applicable in the Polar areas. For all other operations, company communications may be accomplished using HF voice, HF data link, satellite communication (SATCOM) voice or SATCOM data link. Because of the limitations of VHF and satellite-based voice communications, ATC communications will probably require high frequency (HF) voice over portions of these routes. DGCA recognizes that SATCOM may not be available for short periods during flight over the Poles. Communication capability with HF radios also may be affected during periods of solar flare activity. The Operator should consider predicted solar flare activity and its effect on communications for each flight that is dispatched for operations into these areas.

5.7 MINIMUM EQUIPMENT LIST

The Operator must amend its MEL to reflect the items that must be operational for these operations. For ETOPS flights, all MEL restrictions for the applicable EDTO operations apply. Before receiving DGCA authority to

conduct these operations, Operator should review its MEL for consideration of the dispatch availability of the following systems/equipment:

- (a) Fuel quantity indicating system (FQIS), including the fuel tank temperature indicating system;
- (b) APU (when the APU is necessary for an airplane to comply with ETOPS requirements), including electrical and pneumatic supply to its designed capability,
- (c) Autothrottle system;
- (d) Communication systems relied on by the flight crewmember to satisfy the requirement for communication capability; and
- (e) Except for all-cargo operations, an expanded medical kit to include automated external defibrillators (AED).

5.8 TRAINING

The Operator should address the following training requirements in its approved training programs:

- (a) QFE/QNH and meter/feet conversions (required for flight crewmember and dispatcher training);
- (b) Training requirements for fuel freeze, to include maintenance, dispatch, and flight crewmember training (special curriculum segments);
- (c) General route-specific training on weather patterns;
- (d) Relevant airplane system limitations (for example fuel temperature limits);
- (e) Role of the maintenance department in providing airplane systems capability information to dispatch and flight crewmember to aid the PIC in diversion decision making;
- (f) Crewmember training in the use of the cold weather anti-exposure suit,
- (g) For dispatch and crewmember considerations during solar flare activity, the Operator must provide crewmember training. Refer FAA AC 120-61b -In-flight Radiation Exposure.
- (h) Training for flight crewmembers and dispatcher roles in the Operator's passenger recovery plan

6. FLIGHT CREW DUTY TIME LIMITATIONS

Because of the sector lengths across the Polar Region, operators need to have in place both a DGCA approved crew rest plan, and a plan for the clear determination of command authority, consistent with those as approved for other Ultra Long Range (ULR), Specific Long Range (SLR) or Long Range city pair approvals, and for the same reasons.

7. RADIATION

- 7.1 The operator must regularly monitor space weather activity and provide radiation forecast to the crew.
- 7.2 A clear dispatch policy guideline on Solar, Electromagnetic and/or Geomagnetic Radiation must also be in place.
- 7.3 For further information on Radiation Refer to FAA AC 120-61b -In-flight Radiation Exposure.

8. SPECIAL EQUIPMENT FOR POLAR OPERATIONS.

- 8.1 A minimum of two cold weather anti-exposure suits must be on board each airplane, so that outside coordination at a diversion airport with extreme climatic conditions can be accomplished safely.
- 8.2 A short term MEL relief for this item may be granted provided the Operator has arranged ground support provisions for providing such protective clothing at alternate airports.
- 8.3 DGCA may also relieve the operator from this requirement during those periods of the year when the seasonal temperature makes the equipment unnecessary.

9. OPERATOR'S OPERATIONAL FLIGHT PLAN

The Operational Flight Plan must be developed with reference to Regulations on Polar operations.

9.1 Content of the Operational Plan.

The Operational Flight Plan must include the following elements but not limited to:

- (a) The required route and area of operation,
- (b) En Route diversion airports selected, identified, and validated for suitability and approved by DGCA
- (c) The Passenger Recovery Plan formalised, tested in principle and approved by the authority.
- (d) Fuel Freeze Monitoring and Management programs put in place, and all necessary air and ground staff trained in their use.
- (e) Aircraft Communications and Navigation systems ensured as serviceable and validated for operational use.
- (f) MEL considerations reviewed and prepared to meet the requirements.
- (g) All relevant personnel fully trained to the requirement of their position and relationship to the Polar Operation.
- (h) Established long range requirements for crewing and rostering in place.

- (i) Programs in place for the gathering, dissemination, and flight following of Space Weather data for each operating flight.
- (j) Special Equipment obtained and stored as required on each aircraft used for Polar Operations. (Note: If used as a “Fly-Away Kit”, Ground personnel trained and prepared to ensure that the kit is placed on board for each Polar flight and signed off in the Technical Log.)
- (k) Planning made well in advance for the DGCA to observe and record the details of the Reaction and Recovery Exercise and the Validation Flight. (During that phase all aspects of the Operational Plan will be assessed for their content, functionality and extent.)

10. APPROVAL PROCESS

10.1 Any operator wishing to obtain Polar authorization must submit an application with all supporting data to DGCA regional office. The application must address all the regulatory requirements for Polar operations. The application should be submitted at least 60 days prior to the proposed start of Polar operations with the specific airplane-engine combination. Before grant of approval an operator must satisfy DGCA that the proposed operation can be conducted safely.

10.2 Operator's application

The following supporting documents should accompany the operator's application:

- (a) The operator's operational plan in accordance with (9) above.
- (b) Commencement of route schedule
- (c) Crew rostering and scheduling procedures
- (d) Operational Staff training program
- (e) Sample of the required navigational charts

- (f) Date of the Operator's operational plan validation by DGCA (either together with the validation flight or separately)
- (g) Amendment to Operations Manual related the proposed operations plan.

10.3 The application must ensure sufficient lead time for consideration of the proposed operational plan by the DGCA

10.4 Documents Review

10.4.1 DGCA shall review the operator submitted documents, to ensure all requirements of have been met, and this should be a consultative process involving interaction between the DGCA and the operator.

10.5 Demonstration and Validation

10.5.1 Operator's operational plan validation, and assessment of the following areas:

- (a) The Passenger Recovery Plan (simulated reaction and recovery to one of the designated en route alternates.)
- (b) Flight Crew and Operational staff training
- (c) Inspection of required special equipment AED

10.5.2 Polar Route Validation Flight

In order to receive approval to conduct Polar operations, the operator must complete a successful table-top exercise (Polar operations readiness check) & DGCA observed validation flight which should include demonstration of its reaction and recovery plan in the event of a diversion to one of its designated en-route alternate airports with emphasis on:

- (a) Communications;
- (b) Coordination;
- (c) Facilities;
- (d) Accuracy of NOTAM and weather information; and
- (e) Operability of ground equipment during the simulated diversion.

10.5.2.1 For aeroplane weight and balance purposes, revenue cargo may be carried in a validation flight.

10.5.2.2 DGCA may permit the operator to complete the reaction and recovery plan exercise prior to validation flight. In such case, the validation flight may be conducted with commercial passengers on board.

10.5.3 Certification and Operational Specifications

Once all the conditions are met to the required Standards then the Operator Will be granted permission to operate in the Polar Area. DGCA approval is granted by an amendment to the operator's Ops Specs.

11. MONITORING AND OVERSIGHT

11.1 Management Responsibility

The operator's management remains responsible for the monitoring and oversight of the preparation, development, implementation and operation of all flight operations into the polar region. The Flight Operations Department should ensure that areas peculiar to Polar operations are properly briefed before the flight by dispatch and are continuously monitored by operations control when flights are operating within this region. This will include but is not limited to radiation and diversion airfield conditions and availability. Any changes affecting the flight will be dispatched to the operating aircraft by the quickest means possible.

11.3 Flight crew feedback and Operational review

Operators approved to operate into the Polar Regions are encouraged to obtain feedback from crew flying the routes. For the first six months, this information along with operational data obtained from other means will be used to provide a monthly report indicating operational performance.

Sd/-
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