GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION
OPP. SAFDARJUNG AIRPORT, NEW DELHI

OPERATIONS CIRCULAR 04 OF 2023

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Subject: Monsoon Operations

1. Introduction

Flight operations during Pre-monsoon and Monsoon season present serious hazards to the safety of flight operations. Heavy rainfall, enroute icing, moving cloud, severe turbulence, strong gusty winds, severe thunderstorms, and lightning inside the clouds etc. are some of the challenging scenarios that a pilot has to contend with while flying during a monsoon.

2. Purpose

This circular is being issued to operators and all aviators to re-iterate existing guidelines including safety measures on adverse weather operations to avoid any incident.

3. Applicability:

This circular is applicable to all operators/pilots.

4. Guidelines as per Phase of Flight:

4.1 Pre-Flight

4.1.1 Crew Briefing whether self-briefed or by a dispatcher should cover Aircraft status, especially MEL and its impact on monsoon operations. Latest Departure, enroute, Destination and alternate weather should be provided to the crew and changes to enroute, destination and alternate weather should be transmitted to crew whenever there is a significant deterioration post pre-flight briefing stage. The crew should also endeavor to keep themselves updated with required weather information from all available sources.

4.1.2 Fuel uplift calculation should be done judiciously, taking into account enroute, destination weather and trend forecast. Selection of suitable destination alternates is also an important aspect during adverse and monsoon conditions (Refer to CAR Section 8 Series O Part II).

4.1.3 NOTAMS regarding degradation of any Nav aids, runway or Approach Lighting System, Runway or Taxi way closures should be reviewed judiciously. Knowledge of aerodrome lights including runway & taxiway lights will increase awareness during taxi, take-off and landing.

4.1.4 Crew must familiarise themselves with the policy and procedures for Global reporting Format (GRF)

4.2 Taxi & Take off

4.2.1 The effect of prevailing wind conditions and runway surface condition on aircraft performance should be considered for performance calculations. Any significant deviation, specially increase in tail wind conditions and deteriorating runway surface conditions should warrant performance to be re-calculated prior to take-off.

4.2.2 Correct use of weather radar is very important. A common error is not having the weather radar in the correct mode and range during take-off. Situational awareness and RT monitoring give indications of the anticipated weather in the take-off path. When uncertain about the appropriate course of action prior to departure due to weather radar indications, flight crew may seek information from Air Traffic Control regarding weather avoidance measures undertaken by other departing aircraft. Intentions of weather avoidance should be communicated clearly to ATC prior to take-off if possible. Flight crew should be aware of suspected windshear on departure path and review windshear procedures in case of adverse weather conditions.

4.3 Climb/Enroute/Descent

4.3.1 Regular updates should be obtained from available sources for enroute and destination weather specially if there is a forecast of adverse weather enroute or at destination aerodrome. Alternate selection during such periods needs to be given due consideration. The available fuel should be constantly monitored, as enroute weather avoidance and use of anti-ice devices may end up consuming more than the planned fuel for such activity.

4.3.2 Operators shall ensure that flight crew are provided guidance on the operational conditions that necessitate an air turn-back, diversion, or rerouting to an alternate aerodrome. These conditions shall include, but not be limited to, obstructive thunderstorms or line squalls, severe turbulence or windshear, icing conditions exceeding aircraft certification limits, sudden onset of low visibility, or any rapidly

deteriorating meteorological phenomena that may compromise the safety of flight. The above list of conditions is illustrative and not exhaustive.

4.3.3 Plan the weather avoidance early enough from a radar return / echo. If possible, the deviation should be upwind instead of downwind due to lesser turbulence and hail. If possible, avoid the 'area of greatest threat' by at least 20 NM upwind and increase this distance if the convective clouds are very dynamic. Avoid flying below a convective cloud due to possible severe turbulence, possibility of windshear, microbursts, hail or lightning strikes.

4.3.4 At temperatures below freezing near convective weather, airplanes can encounter high concentrations of small ice crystals. These ice crystals can accumulate in the engine core. This phenomenon is referred to as **Ice Crystal Icing (ICI)**. Thereafter, ice shedding can cause engine vibration, engine power loss, icing of air data probes and engine damage. ICI is usually difficult to detect because of lack of significant radar returns and such areas are often found in high concentrations above and near regions of heavy precipitation and sometimes be several nautical miles away from the core of the associated convective cloud. Hence lateral avoidance should be preferred to vertical avoidance.

4.3.5 With reference to points 4.3.2. and 4.3.3, crew should strictly adhere to guidelines by the OEM and instructions issued by their operator with respect to severe turbulence / weather penetration.

4.3.6 Prior to descent, weather and fuel for diversion should be discussed and clearly understood by the crew members, as this can create uncertainties at later stages of the approach.

4.3.7 Crew are advised to adopt a conservative approach to decision-making. It is acceptable and often prudent not to proceed to the planned destination in uncertain conditions. Options such as entering a holding pattern, diverting, or returning should be exercised without hesitation when warranted.

4.4 Approach & Landing

4.4.1 Selection of the type of approach is very important, all efforts should be made to conduct instrument approaches and specially those where lateral and vertical guidance is available. Visual approaches should be avoided as far as possible. Weather minima should be strictly followed.

4.4.2 Stabilized approach and the importance of the same has been documented at many places. However, it has been observed in a majority of runway excursions and hard landings were caused due unstabilised approaches. In adverse weather, stabilised approach is the first step towards a safe landing.

4.4.3 In the event of an unstabilised approach, initiation of a go-around is the primary

and most critical maneuver to ensure flight safety.

4.4.4 Visual Illusions on Approach

Poor weather conditions can cause illusions during landing, making it difficult to judge distance and altitude accurately.

Rain at Night

When it rains at night, the lights of the Approach Light System can appear brighter than they actually are. This heightened brilliance can make the runway seem closer than it really is. The threat is that a pilot might mistakenly believe they are closer to the runway and land short of the threshold.

Wet Runway

A wet runway reflects very little light. This lack of reflection can make the aircraft appear further away from the runway than it actually is. This illusion increases the risk of a late flare and a hard landing.

Pilots need to be aware of these visual illusions and take precautions to counteract them, ensuring a safe and accurate landing.

Pilots are reminded of the critical importance of timely decision-making to ensure continued safety of flight.

5. Communication

Communication with passengers, cabin crew, and ATC regarding anticipated turbulence is a crucial element of safe operations. Formalizing this in SOPs and training programs will reduce passenger anxiety and operational risks

5.1 Passengers

5.1.1 Announce expected turbulence in advance, using clear and calm tone. Switch ON the seatbelt signs (if installed)

5.1.2 During turbulence, remind passengers to remain seated with seat belts fastened.

5.1.3 Provide updates when conditions improve.

5.2 Cabin Crew

5.2.1 Pre-flight briefing to cabin crew should include details about anticipated turbulence during the flight

5.2.2 During the flight, alert them early enough for expected turbulence, in order for them to suspend services, secure the galley and cabin, as needed

5.2.3 Communicate and release the crew after turbulence; check for any injuries afterward.

5.3 ATC

5.3.1 Inform ATC when encountering significant turbulence, sharing position and severity.

5.3.2 Request early altitude and / or lateral deviations, if needed.

6. Flight Crew experience

While adhering to the minimum cockpit experience laid down by DGCA, the operators should carry out their own risk assessment before conducting operations during the adverse weather conditions and make available, sufficiently experienced crew in the cockpit.

7. FDTL & Night Operations

The crew rostering should factor in the fatigue element associated with the operations during the adverse weather conditions. No FDTL extension shall be granted during monsoon season.

8. FOQA Monitoring

All operators should increase crew awareness on the flight parameters that are likely to be exceeded during monsoon.

9. Training

9.1.1 Incorporate scenario-based trainings, requiring pilots to evaluate adverse weather conditions necessitating diversion or returning back. All operating crew must undergo formal orientation and simulator-based training specific to diversion handling and related scenarios, to ensure readiness and proficiency (CAR Section 8 Series C Part I).

9.1.2 Emphasize Threat and Error Management (TEM) frameworks that ~~explicitly~~ encourage air turn back / enroute diversion as a valid risk mitigation strategy.

10. Climate Change

Caution: Increase in number of extreme weather events and variability in weather due to climate change. Climate change is increasing the frequency and intensity of extreme weather events, including concentrated torrential/heavy rainfall, severe turbulence within/around cumulonimbus (CB) cells, and rapid weather system evolution. Extended monsoon breaks may create a false sense of security.

10.1.1 All flight crew and IOCC / dispatch personnel shall exercise heightened vigilance during monsoon operations due to potential unanticipated weather events of climate change.

10.1.2 The proactive assessment and command authority are critical to mitigating climate-accelerated risks. Prioritize the safety of passengers, crew, and aircraft above schedule pressure.

10.1.3 Keeping safety in mind, the flight crew should remain proactive and consider deviation, enroute diversion or air turn back without hesitation.

11. PIREPS

A Pilot Report (PIREP) is a crucial tool for real-time weather information, offering insights into actual conditions encountered by airborne pilots. Pilots typically submit a PIREP to Air Traffic Control (ATC) or Flight Service when the observed weather deviates from or is worse than the forecast.

These reports often highlight significant phenomena not adequately captured in forecasts, such as:

- Low visibility
- Turbulence
- Icing conditions
- Thunderstorms

PIREPs provide invaluable, firsthand accounts that contribute to a more accurate and immediate understanding of atmospheric conditions for other pilots and aviation authorities.

Keeping the above in view, Operators are further advised to adhere to the laid down regulatory guidelines diligently in order to avoid any incident/accident due to adverse weather phenomena as indicated below:

i. Operation of Commercial Air Transport – Aeroplanes CAR Section 8 Series O Part II
ii. All Weather Operations CAR Section 8 Series C Part I
iii. Operations Circular 06/2022 – Standard Operating Procedures
iv. Operations Circular 01/2021 - Global Reporting Format
v. Operations Circular 09/2017 - ALAR and CFIT reduction tool kit
vi. Air Safety Circular 03/2017 - Adverse weather Operations.
vii. Flight Duty and Time limitations CAR Section 7 Series J Part III and Part IV
viii. Operation of Commercial Air Transport – Aeroplane CAR Section 8 Series O Part II

This circular supersedes following circulars:

1. Air Safety Circular 02 of 2019 - Monsoon Operations
2. Air Safety Circular 01 of 1990 - In flight and Post flight weather reporting /debriefing by the Pilots.

Sd/-

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