

Aerodrome Adverse Weather & Low Visibility Operations

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Introduction

EASA mandates that aerodromes operating in adverse weather or low visibility conditions must adhere to strict requirements outlined in EASA Part-ADR (Aerodromes) and associated AMC (Acceptable Means of Compliance) and GM (Guidance Material). These requirements include:

- Runway Visual Range (RVR): Aerodromes must have systems in place to measure and report the RVR accurately. This is crucial for ensuring that pilots have the required visibility information for landing and takeoff.
- Low Visibility Procedures (LVP): Aerodromes must implement LVPs when visibility falls below a certain threshold, generally below 550 meters. This ensures safe aircraft movements and prevents collisions on the ground.
- Instrument Landing System (ILS) Categories: Depending on the ILS category (CAT I, CAT II, or CAT III), the level of automation and precision of aircraft guidance systems must increase as visibility decreases. Aerodromes must be equipped and certified to support these categories, with CAT III systems supporting landings in near-zero visibility.

Adverse weather poses significant challenges to aerodrome operations, here we consider best practices and potential issues to manage adverse weather at aerodromes, ensuring both operational continuity and safety:

Weather Monitoring and Forecasting

It is important to avoid over-reliance on Automated Systems ensuring to engage with human interpretation, especially when predicting severe weather like microbursts or thunderstorms, which may develop rapidly.

Weather forecasts may sometimes be inaccurate or change abruptly, leading to misinformed operational decisions. It's important to have contingency measures to adjust operations quickly when this happens.

One of the first steps in managing adverse weather is accurate weather monitoring and forecasting.

- Aerodromes must have reliable systems and partnerships in place to provide real-time data on changing weather conditions.
- Best practice includes Doppler radar, wind shear detection, and lightning monitoring.
- Establish close coordination with national and regional meteorological services to receive timely and accurate weather forecasts.
- Automated Weather Observing Systems (AWOS) can provide continuous updates on weather parameters like visibility, precipitation, and wind conditions at the aerodrome, helping decision-makers respond quickly to evolving situations.

Runway and Taxiway Management

During adverse weather, maintaining the usability and safety of runways, taxiways, and aprons is a priority.

Waiting too long to close runways for cleaning or de-icing can lead to reduced braking action or even aircraft overruns.

Insufficient or outdated equipment for snow and ice removal may result in delayed recovery of operational surfaces. Aerodromes should invest in modern, efficient machinery to handle extreme winter conditions.

- Frequent inspections should be conducted during severe weather to monitor for signs of surface contamination like snow, ice, or standing water.
- Runways should be closed for cleaning or de-icing if needed.
- friction measuring devices to assess the braking action on the runway during snow or ice conditions. This allows for timely decisions regarding whether operations can continue safely.
- Ensure effective drainage systems are in place to prevent water pooling on runways and taxiways, which can lead to hydroplaning.
- Use of Runway Condition Assessment Matrix (RCAM) for standardized assessment of runway conditions during adverse weather, facilitating communication with pilots regarding surface safety.

De-icing and Anti-icing Operations

De-icing and anti-icing procedures are essential to maintain aircraft safety in cold and icy conditions. Managing these operations efficiently can significantly reduce delays and safety risks.

- Designate specific areas at the aerodrome for de-icing operations to avoid congestion near runways or taxiways.

- Ensure efficient communication with airlines and ground crews to minimize delays in de-icing operations, allowing for the smooth flow of aircraft departures.
- De-icing operations should be closely coordinated with air traffic control and airline schedules to avoid unnecessary de-icing repetitions.
- Aerodromes should follow environmental best practices by managing the runoff of de-icing chemicals and using more eco-friendly alternatives when possible.

Aerodrome Air Traffic Management

Efficient air traffic management (ATM) is key to ensuring safety and minimizing delays during adverse weather conditions.

Adverse weather often increases the complexity of air traffic control operations. Overloading controllers with high volumes of traffic can lead to human errors.

Without appropriate flow control measures, congestion can quickly develop, causing delays, missed connections, and increased operational costs. Flow control should be dynamically adjusted as weather conditions change.

- **Sequencing and Spacing Adjustments:** During adverse weather, air traffic controllers will typically increase separation distances between aircraft, particularly during low visibility or high winds, to account for slower reaction times and unpredictable conditions.

Communication and Coordination

Managing adverse weather at aerodromes requires a combination of proactive planning, effective use of technology, timely communication, and robust contingency plans.

During extreme adverse weather, such as flooding or storms, there may be a need for coordination with external emergency services

Poor communication between stakeholders can influence the potential for accidents, delays, and inefficiency.

- Clear and timely communication between all stakeholders is crucial for managing operations and ensuring safety particularly when dealing with adverse weather
 - Provide frequent weather updates to all relevant stakeholders, including airlines, ground crews, and air traffic control.
 - Implement digital platforms for the dissemination of critical information, including weather forecasts, runway status updates, and LVO (Low Visibility Operations) procedures.

- Develop and regularly update crisis management plans that define the roles and responsibilities of all parties during adverse weather. These plans should include provisions for passenger handling, flight diversions, and ground staff management.

Operational Procedures

Adverse weather conditions necessitate changes in standard operating procedures at aerodromes:

- Low Visibility Operations (LVO): These procedures, activated when RVR falls below the aerodrome's minimum requirements, include restricted vehicle movement on the airfield and limitations on simultaneous aircraft operations.
- Runway Inspections: More frequent inspections of runways, taxiways, and aprons are required during adverse weather conditions to ensure that surfaces remain safe for aircraft operations.
- Contingency Planning: Aerodromes must have contingency plans for dealing with weather-related disruptions, such as diverting flights, closing runways, or coordinating with nearby alternate airports.

Next Steps

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