

Fog-Induced Disruptions in India: How Railways and Airlines Manage Winter Delays

January 12, 2026 • vajiramandravi.com



Fog-Induced Disruptions Latest News

- Every winter, dense fog—especially in northern India—disrupts travel plans, causing delays and cancellations across rail and air networks.
- Low visibility affects safety and scheduling, forcing operators to slow down or halt services.
- Indian Railways faces severe congestion during foggy periods, with cascading delays and cancellations.
- To mitigate risks, it equips loco pilots with fog safety devices and is investing in improved fog-related technologies, while prioritising **safety over speed**.
- Airlines have managed fog better through advanced navigation technology and specialised operating procedures.
- However, surging passenger volumes mean that even brief disruptions can trigger widespread knock-on delays across airports and flight schedules nationwide.

Why Fog Lingers Over North India

- Northern India is mainly affected by **radiation fog**, which forms on clear winter nights when the ground cools rapidly, moisture condenses, and calm winds trap the fog near the surface.
- This leads to frequent episodes of extremely low visibility that disrupt train and flight operations.
- **Air pollution** worsens the problem. Smog mixes with fog, making it denser, lowering it closer to ground level, and prolonging poor visibility even after sunrise.
- High pollution levels, especially around Delhi, have increasingly intensified and extended fog-related disruptions over the years.

How Flights Operate in Low-Visibility Conditions

- **Low Visibility Procedures (LVP)** – When dense fog sharply reduces visibility, airports activate Low Visibility Procedures. These include Low Visibility Take-Offs and precision landings using advanced navigation aids.
- **Instrument Landing System (ILS) CAT IIIB** – ILS, a ground based radio navigation system, provides pilots with accurate horizontal and vertical guidance during landing. CAT IIIB, one of the highest precision categories, allows landings with visibility as low as 50 metres.
- **Limited Airport and Aircraft Capability** – Only select Indian airports, most notably Delhi, are equipped for CAT IIIB operations.
 - Airports without such systems must resort to delays or cancellations during heavy fog.
 - Aircraft and flight crew also require specific certification to operate under CAT IIIB conditions.
- **Airline Preparedness** – Airlines plan rosters to ensure enough CAT IIIB-trained pilots and crew are available at fog-prone airports. They also position CAT IIIB-certified aircraft at these hubs to reduce disruption.
- **Forecasting and Regulation** – The aviation regulator has designated December 10 to February 10 as the official fog season. Airlines and airports rely on real-time weather data, predictive analytics, and AI-based tools to anticipate fog and manage operations more efficiently.

Why Fog-Related Flight Disruptions Cannot Be Fully Avoided

- **Safety Limits Under Low Visibility Procedures** – Even with Low Visibility Procedures in place, operations slow down significantly. Aircraft need greater spacing during take-offs and landings, which reduces overall airport capacity.
- **Reduced Airport Throughput** – In dense fog, major hubs like Delhi see hourly aircraft movements drop sharply. Recovery from even one hour of fog can take two to three hours, creating cascading delays.
- **Ground Movement Constraints** – Taxiing between runways and terminals becomes much slower in poor visibility, adding to congestion and delaying both arriving and departing flights.
- **Mismatch Between Landing and Take-Off Visibility** – CAT IIIB landings can occur at lower visibility than take-offs. This can cause arriving aircraft to pile up while departures remain grounded, leading to parking congestion and diversions.
- **Visibility Below Operational Thresholds** – If visibility falls below 50 metres, even CAT IIIB operations may be suspended, forcing a halt to landings until conditions improve.
- **Flight Diversions and Alternate Airports** – Airlines plan fair-weather alternate airports for diversions during fog. Final diversion decisions depend on real-time weather and the availability of engineering support

at alternate locations.

How Indian Railways Manages Train Operations During Fog

- Dense winter fog in northern India causes severe train delays, sometimes exceeding 12 hours.
- Safety concerns make fog management a critical operational priority for Indian Railways.

Fog Safety Devices for Loco Pilots

- Indian Railways uses Fog Safety Devices (FSDs)—GPS-based handheld tools that give audio-visual alerts to drivers about signals, stations, crossings, and obstacles in geo-fenced areas.
- In December 2025, 25,939 FSDs were deployed, with around 23% allocated to Northern Railway, the most fog-prone zone.

Modified Signalling to Reduce Risk

- To prevent congestion and accidents during fog, Northern and North Central Railways use modified automatic signalling, limiting train movement to two trains between stations. Luminous strips on signals improve visibility.

Kavach: Automatic Train Protection System

- Indian Railways is rolling out Kavach, its Automatic Train Protection (ATP) system, which displays signal information inside the locomotive cabin and automatically applies brakes if needed.
- This allows safer operations even in dense fog.
- The advanced Kavach 4.0 has been commissioned on 738 route km, covering key sections of the Delhi-Mumbai and Delhi-Howrah high-density corridors.

Source: IE | ToI

Source: <https://vajiramandravi.com/current-affairs/fog-induced-disruptions-in-india-how-railways-and-airlines-manage-winter-delays/>

© Vajiram & Ravi. For personal use only.