Air India's Boeing 787 Crash

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Air India's Boeing 787 Crash: A Wake-up Call for Aviation Oversight

Context:

A major aviation disaster occurred when an **Air India Boeing 787 Dreamliner** flying from **Ahmedabad to London Gatwick** crashed **shortly after takeoff**, with **242 people** on board. The incident happened in **Meghani Nagar**, a **densely populated area near the Ahmedabad airport**, raising serious concerns about aviation safety and Boeing's aircraft integrity. The cause is still **under investigation**.

This incident adds to the **growing global scrutiny** on Boeing and opens up a wider discussion on **air safety, aircraft engineering, pilot preparedness**, and the **regulatory role of aviation authorities**.

Boeing 787 Dreamliner: Features and Background

- Introduced in **2007** as a **next-generation long-haul jet**.
- First commercial flight: **2012**.
- Aircraft involved in the crash **joined Air India's fleet in 2014**.
- Designed to be a **more fuel-efficient successor** to the Boeing 777.

Key Features

- **Material**: Made of **carbon fibre composite**, lighter than aluminium.
- **Fuel Efficiency**: Uses **25% less fuel** than older aircraft.
- **Comfort**: Larger windows, improved **cabin pressure and humidity**.

- **Variants**: Available in **787-8**, **787-9**, and **787-10** models.

Safety Concerns Surrounding Boeing 787

- **Ongoing Investigations** by the **US Federal Aviation Administration (FAA)** into Boeing's manufacturing and quality control.

Whistleblower Allegations

- **Sam Salehpour (2024)**: Reported that **fuselage sections were improperly fastened**, increasing long-term safety risks.

- **John Barnett (2019)**: Alleged the use of **substandard parts** in production; found **dead in 2024 under suspicious circumstances**.

Notable Incidents Involving Boeing 787

- **2013**: Global grounding of 787s due to **lithium-ion battery fires**.

- **2024**: A **Latam Airlines 787** experienced a **mid-air drop** caused by **human error**.

Why Most Aviation Accidents Occur During Takeoff and Landing

Aviation safety data consistently shows that **takeoff and landing are the most dangerous flight phases** due to multiple operational challenges.

IATA Data (2005-2023):

- **Landing**: **53%** of all accidents.

- **Takeoff**: **8.5%**.

- **Approach**: **8.5%**.

- **Initial climb**: **6.1%**.

- **Rejected takeoffs**: **1.8%**.

Boeing Data (2015–2024):

- **Takeoff + initial climb**: Account for **20% of fatal accidents** and **fatalities**, despite **only 2% flight time**.
- **Climb phase**: **10% of fatal accidents**, **35% of fatalities**.
- **Final approach + landing**: **47% of accidents**, **37% of fatalities**.
- **Cruise phase**: **Only 10% of fatal accidents**, **<0.5% of fatalities**, though it constitutes **57% of flight duration**.

Reasons for Higher Risk During Takeoff and Landing

- **Low Altitude, Low Speed**: Aircraft are close to the ground, offering **very limited time** for corrective action.
- **Engine Stress**: Engines operate at **maximum thrust** during takeoff, increasing chances of failure.
- **Pilot Workload**: High workload involving **real-time calculations** of wind, aircraft weight, runway conditions, etc.
- **Stall Risk**: Wing stall more likely during sharp nose-up takeoff angles.

Wing Stall Explained

- Occurs when the **angle of attack exceeds safe limits (15–20°)**.
- Causes **turbulent airflow** and **loss of lift**.
- Can result in **sudden loss of altitude** or crash if not corrected quickly.

Environmental Hazards at Low Altitude

- **Bird Strikes**
- **Wind shear and turbulence**
- **Heavy rain and poor visibility**

These are more frequent **during takeoff and landing** phases and harder to manage due to **limited response time**.

Is Flying Still Safe?

Despite occasional high-profile crashes, **aviation remains the safest mode of transport**.

ICAO Data:

- **Accidents per million departures** reduced from **4.9 in 2005** to **1.9 in 2023**.

Reasons for Improved Safety:

- **Better pilot training** using simulators.
- **Advanced aircraft design and materials**.
- **Stricter safety protocols and audits**.
- **Real-time weather forecasting and tracking**.