Air India Express Flight 1344 Crash Report

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1. Introduction and Accident Summary

On August 7, 2020, Air India Express Flight 1344, a part of the Vande Bharat Mission to repatriate stranded Indian citizens during the COVID-19 pandemic, crashed while landing at Kozhikode International Airport, Kerala, India. The aircraft, a 14-year-old Boeing 737-800, overshot the tabletop runway during heavy rain, fell into a 110-foot gorge, and broke into two. The crash resulted in the deaths of 21 people, including both pilots, with several others injured.

The flight originated from Dubai, United Arab Emirates, and was carrying 184 passengers, including 10 infants, to Kozhikode. The weather conditions at the time of landing were poor due to heavy monsoon rainfall, common in that region.

2. Aircraft Details

- Model: Boeing 737-800

- Flight Number: IX1344

- Age: 14 Years

- In Service with Air India Express Since: 2006

- Flight Route: Dubai (DXB) → Kozhikode (CCJ), Kerala

- Type of Flight: Vande Bharat repatriation flight

3. Kozhikode Airport Details

- Runway Type: Tabletop (runway built on a hill plateau)

- Drop from runway ends/sides: ~110 ft

- Runway Width: 75 m (standard is 140 m)

- RESA (Runway End Safety Area): 71–85 m (standard is 90x90 m)

- Approach Light Length: 150 m (standard is 900 m)

- Categorized as a critical airport: Only captains are allowed to operate flights in/out of Kozhikode.

4. Weather and Environmental Conditions

- Heavy rain with visibility of 1500–2000 m

- Moderate thunderstorm, wet runway, winds from 260° @ 5 knots

- Alternate airports: Coimbatore, Trichy, Kochi

  - Kochi was selected, but had similar bad weather

  - Coimbatore had clear weather, but was not considered

5.1 Flight and Crew Details

- The flight initially departed Kozhikode at 4:49 UTC as a ferry flight (no passengers) to Dubai, landing at 8:11 UTC.

- Return flight was scheduled at 9:30 UTC, but boarding was delayed due to COVID-19 protocols.

- The aircraft finally took off at 10:00 UTC from Dubai.

5.2 Captain Details

The captain was a former Indian military pilot who joined Air India and later Air India Express in the year 2000. He had over 11,000 hours of flying experience, with 4,500 of those hours specifically on the Boeing 737-800 aircraft. He had a known medical condition—diabetes—and was prescribed to take allopathic medicines, but without anyone's knowledge he was taking Ayurvedic medicines also. This combination was caused fluctuations in blood sugar levels, which could impact cognitive performance. Between 2009 and 2014, training records revealed more than nine remarks about his reduced concentration and visible stress during critical flight phases, especially landings. Although initially rostered for standby duty, a last-minute change required him to fly to Doha the next day. The departure time was eventually adjusted from 8:30 AM to 10:00 AM to ensure a mandated 15-hour rest period.

5.3 First Officer Details

The First Officer was a 32-year-old male with approximately 2,000 hours of total flying experience. He had been working with Air India Express for two years prior to the incident. In comparison to the captain, he was considerably junior and lacked equivalent flight experience. While trained and qualified, his limited authority and experience may have contributed to his hesitance in asserting command or overriding the captain's decisions during the crucial final moments of the flight.

6. Storyline

It was August 7, 2020, and the skies over Kozhikode were dark with rain. That morning, a Boeing 737-800, 14 years old, left Kozhikode with only the crew onboard, headed to Dubai as part of the Vande Bharat mission. After reaching Dubai, the return flight—Air India Express 1344—was delayed because of slow boarding due to COVID-19 protocols. The

captain, a former military pilot with 11,000 flying hours, was under pressure. He had been scheduled to rest but was suddenly asked to take another flight the next morning. This meant the later he landed in Kozhikode, the later he'd take off the next day. That thought stayed on his mind. He also had a history of stress during landings and was secretly mixing ayurvedic medicine with his diabetes pills, which sometimes caused sugar spikes. Alongside him was a much younger co-pilot with about 2,000 hours of experience.

The rain in Kozhikode was heavy. The runway was wet and the airport—built on a hilltop— had shorter safety zones than usual. Even though other airports were available for diversion, no one in the cockpit talked about going elsewhere. As the plane neared Kozhikode, the captain chose to land on Runway 10 despite a tailwind, poor lighting, and shorter length. No landing distance calculations were done. The wipers had failed earlier and a previous landing attempt was aborted. Now, coming in fast and high, the aircraft overshot the ideal touchdown point. The first officer quietly said, "Go around," but the captain ignored it. The brakes and reverse thrust were not used properly in time. The plane slid off the runway at high speed, broke through barriers, and split apart. Twenty-one lives were lost, including both pilots.

7. Sequence of Events Leading to the Crash

The sequence of events that led to the crash began with the malfunction of the aircraft's windshield wipers, which severely reduced visibility during approach. Despite this, the captain attempted a go-around maneuver and climbed to 10,000 feet without obtaining clearance from air traffic control—a violation of standard protocol. Notably, cockpit protocol requires a diversion in the event of wiper failure during heavy rain, but no such discussion occurred between the pilots. The captain elected to land on Runway 10, even though it was the shorter runway, had poor lighting, a tailwind, and required a longer landing distance. Critically, no landing distance calculations were performed. He chose a flap setting of 30°, although 40° would have been more appropriate, and selected an auto-brake setting of 3 instead of the recommended MAX setting.

As the aircraft descended, the autopilot was disengaged at 500 feet, and the descent rate sharply increased to 1500 ft/min—twice the ideal rate of 750 ft/min. The aircraft crossed the runway threshold at 92 feet, higher than ideal, and engine thrust was increased from 61% to 81%, delaying the touchdown further. Ultimately, the aircraft touched down far beyond the designated touchdown zone on a wet runway, with suboptimal configuration and tailwind. The First Officer suggested a go-around, but the captain did not heed the suggestion. Although manual braking and thrust reversers were applied, they were disengaged prematurely. The plane overran the runway at approximately 85 knots, entered the RESA, and broke through the perimeter barrier, resulting in the aircraft breaking apart and causing the deaths of 21 individuals, including both pilots.

8. Swiss Cheese Model Analysis

8.1 Human Factors

- Captain's mental pressure to land on time to meet the rest requirement for the next day's flight to Doha

- Failure to follow SOPs (Standard Operating Procedures)

- Ignored go-around call from First Officer

- Did not calculate landing distance

- Did not brief first officer on landing configuration

- Overconfidence due to previous landings at Kozhikode (36 times that year)

8.2 Technical Factors

- Windshield wiper malfunction

- Faulty simulators used for pilot training – found to be improperly maintained

- Incorrect flap and auto-brake settings

8.3 Environmental & Non-Standard Runway Factors

- Heavy rain and wet runway

- Tailwind landing on a table-top runway

- Non-standard runway dimensions (width, RESA, lighting, etc.)

- Poor visibility

8.4 Organizational Factors

- Last-minute schedule change for the captain

- Inadequate CRM (Crew Resource Management) culture

- Use of substandard simulators by Air India

- Failure to enforce safety protocols regarding equipment malfunction (wiper issue)

When all these individual weaknesses ("holes in the cheese") aligned, the barriers failed, and the accident occurred.

9. Investigation Theories and Observations

During the investigation, several theories and assumptions were made to understand what went wrong. One assumption was that the captain may have had second thoughts about going around for another landing attempt. This was supported by the inconsistent use of brakes and thrust reversers, suggesting a possible mid-decision change during the landing roll. Another theory was that the combination of Ayurvedic and allopathic medicines taken by the captain might have led to cognitive issues. While this could have affected his decision-making, there was no clear medical proof, so it couldn't be confirmed definitively. It was also noted that the first officer, being young and less experienced, might have felt reluctant to challenge or overrule the senior captain's decisions. This assumption was supported by cockpit voice recordings where the co-pilot suggested a go-around but did not push for it further. A confirmed finding was that the simulators used for pilot training were faulty, especially in how they handled runway landings and braking, which could have affected the pilot's real-world judgment.

10. Post-Accident Recommendations and Actions

In response to the incident, multiple safety improvements were recommended. Enhancements to runway lighting at Kozhikode were advised, along with extensions to the RESA areas at both runway ends to provide greater buffer in overrun scenarios. A total of 37 other safety recommendations were put forward, covering various aspects of flight safety, training, and equipment standards. These included a comprehensive review of simulator maintenance protocols and a revamp of pilot training programs to ensure they meet necessary regulatory and safety standards moving forward.

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