

1 Problem

What	Problem(s)	Plane crash, aircraft hit trees on take-off, 49 lives lost
When	Date	August 27, 2006
	Time	6:07 AM
	Differences	Rerouted taxiway, paving, flight before sunrise Crew's first flight at airport since construction began No center-line lights on Runway 22 during construction
Where	Company	Comair - Delta Connection, Flight 5191
	Physical location	Blue Grass Airport (LEX), Lexington, Kentucky Intended Runway 22, Actually used Runway 26
	Equipment	CRJ-100 Regional Jet
	Process location	Pre-flight, Take-off, Lexington, KY to Atlanta, GA
Impact to the Goals		
	Safety	49 deaths, 1 survivor critical
	Cust. Service	Extreme negative loss
	Property, Equip	Aircraft destroyed

LEXINGTON PLANE CRASH

Cause Map

On August 27, 2006, a Comair flight at Blue Grass Airport in Lexington, Kentucky attempted to take off from Runway 26 instead of Runway 22. The fully loaded aircraft needed over 5000 feet of runway to become airborne, but the runway was only 3500 feet long. The aircraft crashed past the end of the runway after it was unable to achieve sufficient lift.

Paving work was being performed at the airport, so barricades blocked the normal taxi route to Runway 22. The pilots confused the alternate taxi route and lined up on Runway 26. The pilots did not verify the compass heading inside the aircraft which matches the number on the runway (22 is 220 degrees from North). The pilots may have believed they were on the correct runway since the center-line lights on Runway 22 were off because of construction.

Cause Mapping is a Root Cause Analysis method that captures basic cause-and-effect relationships supported with evidence.

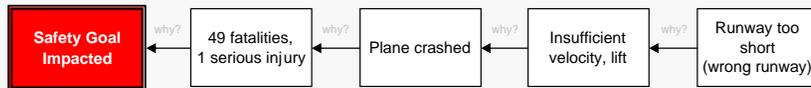
CAUSE MAPPING

Problem Solving • Incident Investigation • Root Cause Analysis



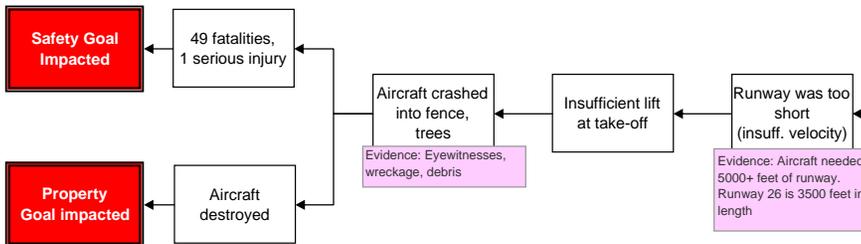
2 Analysis

Basic Cause Map - Start with simple why questions reading to the right.



The plane crashed because it was unable to achieve the velocity necessary for liftoff on the short runway. While this basic Cause Map is accurate, more detail must be revealed to find the most effective solutions to prevent a similar incident at any airport.

Intermediate Level Cause Map - Add detail as information becomes available.



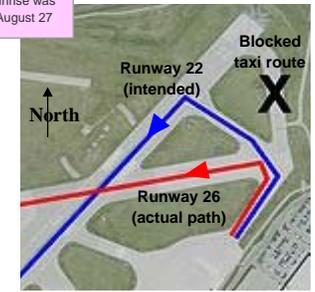
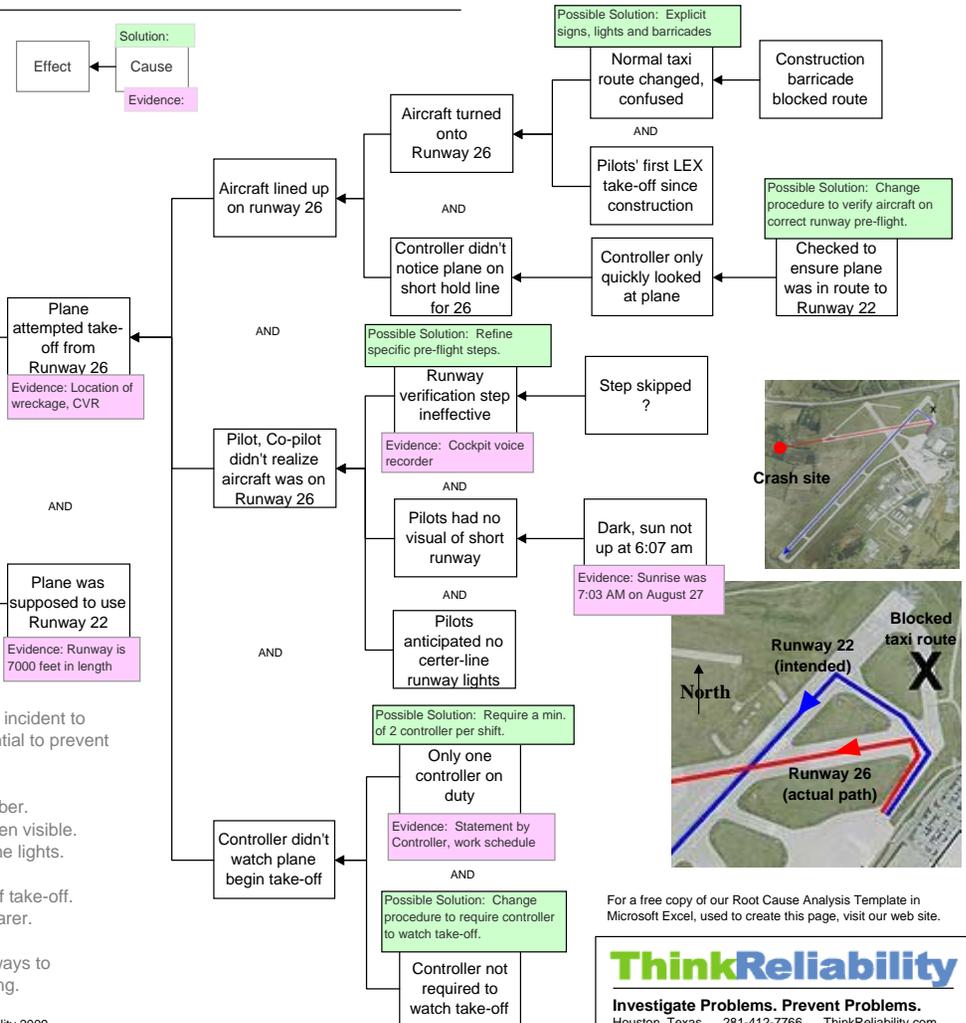
3 Solutions

No.	Cause	Action Item
1	Normal taxi route changed, confused	Explicit signs, lights and barricades.
2	Checked to ensure plane in route to Runway 22	Change procedure to verify aircraft on correct runway pre-flight.
3	Compass check was ineffective	Refine specific pre-flight steps.
4	Only one controller on duty	Require a min. of 2 controller per shift.
5	Controller not required to watch take-off	Change procedure to require controller to watch take-off.

All of the causes had to combine in just this way for the incident to occur. Controlling any one of the causes had the potential to prevent the plane from crashing.

- Pilot or co-pilot could have checked the runway number.
- If the sun was up, the shorter runway would have been visible.
- Pilot or co-pilot could have double checked center-line lights.
- Controller could have prevented it during taxiing.
- Controller could have prevented it at the beginning of take-off.
- Maintenance crew could have made the signage clearer.

Understanding the system of causes reveals different ways to significantly reduce the risk of a similar incident occurring.



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