



National Transportation Safety Board

Flight Crew Factors

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Human Performance



Approach to Landing

- High workload phase of flight
- Nonprecision approaches in instrument conditions require extra vigilance
- Shared expectation is critical

Flight Crew Performance

- Captain did not call for, first officer did not verify approach
 - Vertical guidance provided was meaningless
- Captain did not descend to FAF minimum crossing altitude
- Captain changed to vertical speed without communicating intentions to first officer

Flight Crew Performance

- Crew did not monitor flight path
 - Did not recognize cues that approach not set up properly
 - Continued unstable approach
 - Did not recognize at minimum altitude
- First officer did not make required minimum altitude callouts
- Captain descended below minimums

Fatigue: Captain

- Off duty August 5-12
- Took steps to mitigate effects of fatigue
 - Aug. 12: Napped at home and acquired sleep room in Louisville
 - Aug. 13: Adequate opportunity to rest in Rockford
 - Aug. 14: Acquired sleep room in Louisville
- Accident occurred during window of circadian low

Fatigue: First Officer

- Off duty August 10-12
- Mismanaged off-duty time
 - Aug. 12: returned to duty with about 9-hour sleep debt
 - August 13: less than 5½-hour sleep opportunity
 - August 14: acquired sleep room in Louisville
- Aware of fatigued state

Workload: First Officer

- Had to mentally process change in autopilot mode
- No shared expectation of approach
- 1500-fpm descent twice as fast as normal descent rate
- Pace of duties increased

Expectation of Visual Meteorological Conditions (VMC): Flight Crew

- Weather that crew received indicated ceiling 1000 feet
- Crew not alerted to variable ceiling
- Incomplete weather information increased crew's expectation of VMC
- Cloud base about 350 feet

Flight Crew Factors Summary

- Crew's fatigue due to circadian factors and first officer's acute sleep loss
- Crew's expectation of visual meteorological conditions
- First officer's increased workload



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