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Evidence Only Deepens Crash Mystery

INVESTIGATION from A2

noises heard on the cockpit voice recorder prompted one of the pilots to comment on a "wake encounter," a reference to wake turbulence from the Japan Air Lines Boeing 747-400 it was following. Investigators said last night that the A300 and the 747 had been the proper distance apart.

About a minute after Flight 587 likely became airborne, the first "airframe rattling" noise was clearly heard on the cockpit voice recorder, NTSB member George Black said. Seven seconds later, the captain made a comment about a "wake encounter." Seven seconds after that, the airframe rattling sound is heard again. Seventeen seconds before the tape ends, there are comments about the loss of control, Black said.

Experts were skeptical that wake turbulence from the 747 ahead could have caused the aircraft to break up. "A wake vortex encounter normally should not have sufficient aerodynamic force to cause a structural breakup like that," said John Hansman Jr., a professor of aeronautics at the Massachusetts Institute of Technology. "It seems unlikely that a simple wake vortex encounter would cause that tail to break off."

An Airbus A300 would be required to stay four miles back from a 747, which is classified as a heavy jet with a takeoff weight of more than 300,000 pounds. Air traffic controllers also can separate the aircraft by clearing them for takeoff two minutes apart, which usually gives more than four miles separation.

Bob Ober, a pilot for a major airline who belongs to a national air traffic control advisory committee, said he believed the pilots were referring to the wake turbulence because they wondered what was causing the airframe rattling, not because they were worried about the turbulence.

Czysz said that on a breezy day like Monday, the winds often dissipate the vortex.

While the wake turbulence was likely of little concern to the pilots, the airframe rattling noises are another matter. "It's a concern, depending on the magnitude, the severity and the length of time," Ober said. He said pilots might expect rattling when landing gear is raised, for instance, but not at other times.

"The combination of a rattle back in the airplane and the fact of an in-flight breakup indicates there was some sort of event which occurred which caused the breakup," Hansman said. "We still have no idea as to exactly what that was."

Yesterday, the NTSB discounted catastrophic engine failure that caused turbine parts to come loose and damage the rest of the plane. And they said there was no evidence that a flock of birds had been ingested into the engines.

Staff writers Earl Lane and Katie Thomas contributed to this story.

NEWSDAY, WEDNESDAY, NOVEMBER 14, 2001

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