Not How, But *When* Did the Tail Fail?

April 21, 2004
By Brett Hoffstadt

The NTSB is planning to release their final report on Flight 587 in the summer of 2004. Many people are hoping to find answers to troubling questions related to this tragic flight of November 12, 2001. But based on the first public hearing held by the NTSB in October 2002, and public statements since then, many others believe the NTSB has committed itself to pursuing a mistaken and unsatisfying path – believing that the loss of the vertical tail was the cause of the crash.

As explained in previous articles at U.S.Read, the pilot of Flight 587 commanded a rudder deflection of less than 7 degrees during the fifth and final rudder movement. But to create the force necessary to break the tail at this time, as the NTSB claims happened, the rudder deflection would have to be 11.5 degrees or greater. This number comes from Airbus, whom the NTSB has relied upon for these calculations.

The NTSB, in their final report, might blame American Airlines training programs and the pilot for using excessive rudder controls. But as was shown in our March 26th article, *if* the NTSB is correct about when the tail fell off they have so far failed to explain how the rudder deflected beyond the pilot's input (and beyond the value set by the rudder limiter unit). Or, if Airbus' calculations are shown to be incorrect, they have failed to explain the premature failure of the vertical tail structure. "Premature", because the tail would have failed before the ultimate design loads were exceeded.

Perhaps the NTSB should take a step back, and instead of asking "why" the tail separated, ask "when" did it separate?

The NTSB has assumed since very early in the investigation that the tail separated at 9:15:58.5 AM. But it's very difficult, if not impossible, to make the rudder data, debris path, aircraft loads, and pilot input form a consistent and scientifically valid story based on this assumption.

How did they arrive at a tail separation at this time? One answer is a mysterious clue caught on the

cockpit voice recorder (CVR). The NTSB transcript describes a "loud bang" at 9:15:58.5 AM.

Ever since releasing this transcript, the NTSB has claimed the Loud Bang was the sound of the vertical tail structure experiencing catastrophic failure and separating from the aircraft. However, this claim has not been supported with a detailed audio analysis of the event or a reproduction of the sound on a test aircraft.

To the contrary, the NTSB's Sound Spectrum report stated that *no sounds* on the CVR could be associated with the separation of the tail or rudder.

Is the NTSB trying to make the facts fit their hypothesis rather than the opposite? That is what a number of aviation professionals and concerned citizens suspect.

In fact, significant evidence points to vertical tail separation occurring much later than the sound of the Loud Bang. Some of that evidence includes the location of the vertical tail in the Bay and other debris as well as a tollbooth video. This video shows what appears to be smoke trailing from the aircraft *before* the time of the Loud Bang.

Amazingly, the NTSB has yet to take a close look at the original tollbooth video in their search for clues or explanations. The original video remains in the possession of the FBI, which has failed to release it under Freedom of Information Act requests from U.S.Read. Perhaps most disturbing – the FBI hasn't even released a digital, uncompressed copy of this video to the NTSB for their investigation. Nor has the FBI submitted a report of their analysis of the original tape.

The NTSB hasn't asked for the original video either. They used a second or third-generation VHS copy of this video (provided by the FBI) for their superficial video analysis. Of the two video forensic experts contacted by U.S.Read, both said that any conclusions drawn from these copies are immediately discredited since the NTSB wasn't working from the original.

Then of course there are statements from many eyewitnesses to the crash, some of whom are trained observers like policemen and firemen. They reported seeing the vertical tail separate, but only *after* they saw smoke and flames on the aircraft.

Whenever the vertical tail separated, all hydraulic lines to the rudder would have been severed. This would have created a *repetitive* audible alarm in the cockpit (known as a Level 3 warning). No such alarm was heard after 9:15:58.5. It was first heard *nine seconds later*, at 9:16:07.55.

If, as it seems most likely, the vertical tail separated several seconds after 9:15:58.5, the NTSB has a growing list of questions that ought to be answered in their upcoming final report. And there are a growing number of citizens who will expect considerable answers. Weighing on the minds of many is – if that Loud Bang wasn't the separation of the vertical tail, what was it?

Brett Hoffstadt is one of the industry experts assisting in U.S.Read's Flight 587 coverage. Mr. Hoffstadt began working in the aerospace industry 14 years ago. He has two degrees in aerospace

engineering and specializes in aerodynamics and aircraft performance. He is currently employed by an international engineering analysis company and previously worked at Boeing as a Technical Specialist in Aerodynamics. Mr. Hoffstadt also has professional experience in structural design, composite materials, propulsion, flight simulation, and flight testing.

Home Page || Flight 587 Page || Letters from U.S.Readers || Send E-Mail to the Editor || Search U.S.Read or the Web ||