

UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA
WESTERN DIVISION

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H. RAY LAHR,)	
	Plaintiff,)	
	v.)	CV 03-08023-AHM (RZx)
)	
NATIONAL TRANSPORTATION)	
SAFETY BOARD, et al.,)	
)	
	Defendants.)	
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DECLARATION OF DOUGLASS BRAZY

I, Doug Brazy, am over the age of eighteen (18) years, have personal knowledge of the statements to which I am attesting, and am competent to attest to the information presented. I declare as follows:

BACKGROUND

1. I am employed as a Mechanical Engineer in the Vehicle Recorder Division of the Office of Research and Engineering for the National Transportation Safety Board (NTSB). I have held this position since 1999. I joined the NTSB in December of 1994 as a Mechanical Engineer, following a two-year cooperative position while completing my education. My principal responsibility is to read out cockpit voice recorders (CVRs) and video from a variety of media to assist in determining what caused the accident or incident under investigation. I also have analyzed radar and flight data recorder (FDR) information, and created numerous graphical accident reconstructions, colloquially known as animations¹.

¹ Except for the ease of understanding, the NTSB typically does not use the term "animation." Included with the term animation is the belief that the pictures are contrived or based upon

2. On July 17, 1996, a Boeing 747 crashed into the Atlantic ocean about 8 miles south of East Moriches, New York, after taking off from John F. Kennedy International Airport. This flight was a regularly scheduled flight identified as TWA flight 800.
3. My superiors at the NTSB, who directed my actions, involved me in the investigation shortly after the launch of the first team to the accident site.
4. My first involvement with the TWA flight 800 investigation was to assist with the review and analysis of the radar data, and the FDR data once the recorder was located and brought to the NTSB's laboratory. Next, I observed the recovery operations aboard the USS Grapple. I also worked with the NTSB witness group on a radar study that coordinated witness accounts with the radar data. I performed the evaluation of the radar and FDR data, and the review of the witness accounts as a part of a team, along with the guidance of the management of the NTSB.
5. In anticipation of the public hearing scheduled to begin on December 8, 1997, the management of the Office of Aviation Safety and the Office of Research and Engineering determined that it would be beneficial to create graphical accident reconstructions, for convenience hereinafter referred to as animations, showing the radar tracks of TWA flight 800 and other select vehicles in the area, and the motion of the airplane and the sequence of events related to the accident. I was assigned this task.
6. The purpose of this declaration is to provide a description of the NTSB's process in creating the four animations shown during the public hearing on December 8, 1997, and my search and production of materials responsive to the October 8, 2003 Freedom of Information Act (FOIA) Request related to these animations.

imagined events. NTSB representations, however, are based upon verified data (such as radar or FDR data) as much as possible, and at times, wholly so.

CREATION OF THE ANIMATIONS

7. I created four (4) animations that were presented by John Clark, then Deputy Director of the Office of Research and Engineering, on December 8, 1997. The four productions were: (1) an animation derived from recorded radar data, using an overhead view and showing the ground track of TWA flight 800 from take-off to the position at which the center wing tank exploded; (2) an animation of some of the calculated trajectory paths of key pieces of the aircraft as they separated from the aircraft following to where they were located in the water; (3) using the verified radar and FDR data, an animation of the motion of the TWA flight 800 aircraft from about forty-five seconds prior to the explosion; then continuing using all available radar and FDR data along with the flight path simulation results to continue the animation through to water impact; and (4) an animation using a visual reference point from the shore indicating what may have been seen of the motion of the aircraft until just prior to its impact with the water. Copies of these animations are a part of the hearing transcript from the public hearing, and are available to the public through the agency's Public Inquiries Office.
8. The animations are a visual depiction of the data presented from the radar sources, the digital flight data recorder, and/or the data from the simulations presented in the Main Wreckage Flight Path and Trajectory Studies for TWA flight 800.
9. To create these animations, I used software called VisLab, marketed by Engineering Animation, Inc. of Ames, Iowa. A representative from Engineering Animation, Inc. assisted with these animations by sharing his expert knowledge of the software. I also used a program called Photo Shop to cut the pictures of the airplane model to the correct size. To the best of my recollection, I edited a program that converted the data about the topography

into 3-D models. I used geometry software, 3-D modeling software, and a variety of applications to depict the aircraft, the topography and the trajectory parts, for that animation. Last, I used a program to play back the animations and record them on videotape.

10. Using a conversion program provided by Engineering Animation, Inc., I converted units of angular measurement for ease of the computer program. The position data was not converted because it was in a format compatible with the software. I estimated the orientation of the nose section of the aircraft following the explosion until the impact with water because there was no data describing it. (However, the graphical reconstructions do accurately depict the position information for the nose section of the aircraft that was calculated in Dennis Crider's Trajectory Study. This Study is available in the NTSB's public docket for this accident investigation, and on our web site at www.nts.gov.²) And, to the best of my recollection, either Dennis Crider or I linearly interpolated all data to the thirty-times per second needed for the animation software. The animation software creates 30 frames per second.
11. I did not develop any new or unique conclusions about the flight path of TWA flight 800 through these animations.
12. I performed no calculations, mathematical or otherwise, to change the radar, FDR and flight path data, except to convert units of angular measurement for ease of the computer program, and possibly to linearly interpolate all data to the thirty-times per second needed for the

² For the TWA flight 800 accident investigation, a part of the public docket was placed on the NTSB's web page. At the agency's home page, www.nts.gov, select "Aviation." At the next screen, select "Major Investigations," then scroll down the listing on the left-hand side and select "TWA Flight 800." The next screen is a menu listing a variety of items available from the public hearing held in December of 1997, through to the Board Hearing in the summer of 2000. Select "Docket Information," and this will connect to a listing of a number of the reports available in the public docket. The Trajectory Study is one of the reports available on line.

animation software. I did not use any formulas in the creation of the animations. I did not use any weight or balance data for the creation of the animations.

13. I had no involvement with, and I did not utilize, the computer simulation program used to derive the flight path of TWA flight 800.
14. I received no data from the Boeing Company in order to create these animations (FOIA Request subpart 129).
15. I cannot work in the C or C++ computer programming language.
16. I did not evaluate or analyze any of the data that was provided to me to create the motion of the aircraft or the sequence of events leading to the accident.
17. The following animations used verified radar and FDR data up to the point of the explosion of the center wing tank: the animation showing the ground track of TWA flight 800, the animation of the calculated trajectory paths of some of the key pieces, and the animations from about forty-five seconds prior to the explosion of the center wing tank and using a visual reference point from the shore used. The verified radar data is included in The Airplane Performance Study (a report describing the collection and valuation of the radar data), and the FDR data is included in the Flight Data Recorder Group Chairman Factual Report. Both are available in the public docket and on the NTSB's website.
18. For those animations that continue beyond the explosion of the center wing tank, Dennis Crider, the author of the Main Wreckage Flight Path Study, provided the results of his study. For his Study, Mr. Crider simulated the flight path of the aircraft following the separation of the forward fuselage. I did not have the expertise to develop this simulation data on my own.
19. Upon receipt of the data (verified radar and FDR data, and certain simulation data [the position {in this case, where the plane was in the sky}, and orientation {pitch, roll and

yaw}}) needed to create the animation, and understanding in what format the data had to be entered into the animation software, I performed those unit conversions. (Although not used in the animation, an example of such a conversion is converting yards to feet because the software only understands feet.)

20. Along with the verified radar and FDR data and the simulation data, I also had to enter into the computer program information about the position of the camera (facing, along side or behind the movement), information about the location and terrain, ocean and geographical factors, and information to create explosions, smoke and fire, for example.
21. Combining numerical representations of each of the elements depicted in the animation, I created a frame. The VisLab animation program requires 30 frames per second of animation. Thus I entered these strings of numerical representations of the elements for each frame into the program, and it converted the numbers into a moving picture.
22. None of these numerical representations are visible during the viewing of the animation. In fact, once the animation is finalized, the images cannot be reverse-engineered to recapture these numbers.
23. For the NTSB, with the help of Engineering Animation, Inc., I performed all of the steps necessary to create the four animations that depict the motion of the airplane and the sequence of events related to the accident. NTSB management reviewed and commented on my work at varying stages of the production.
24. I discussed the animations in formal and informal meetings with my superiors including, the former Director of the Office of Aviation Safety, the Director of the Office of Research and Engineering, the former Deputy Director of the Office of Research and Engineering, and the former Chief of the Vehicle Performance Division.

25. Comments from my supervisors and recommendations were accepted and/or rejected during these formal and informal meetings. As a result, these meetings guided my creation of the animations.
26. Candid discussion among the staff is critical to formulating the best analysis and findings in order to inform, advise, and provide recommendations to the five-member Safety Board, which is the ultimate decision-maker, as to the probable cause(s) of an accident, and the safety recommendations that follow from that cause. The Safety Board uses the information provided by the staff, but makes its own decisions. Such candid discussion also is critical to the Safety Board's ability to make recommendations that can alter maintenance of systems, training of personnel, or construction of systems so as to prevent future accidents.
27. While the reports, such as the Flight Data Recorder Group Chairman Factual Report and the Main Wreckage Flight Path Study and the Addenda, have been included in the public docket, the final decision of the Safety Board is found in the Aircraft Accident Report.
28. No report was written concerning these animations.

THE PLAINTIFF'S FOIA REQUESTS

29. I understand from the agency's FOIA Officer, Melba D. Moyer, and the Office of General Counsel that H. Ray Lahr has submitted several FOIA requests. I was first contacted with regard to Plaintiff's FOIA request dated July 31, 2002, numbered 2002-0306 (included in Exhibit II). I, with the assistance of other staff of the NTSB, reviewed the July 31, 2002 FOIA request and the eleven categories of information requested by Mr. Lahr in his letter.
30. The FOIA Office and the Office of General Counsel asked that I search for, and produce potentially responsive documents to the FOIA request dated July 31, 2002. I searched my

office, and the space around the computer systems used to create the animations presented by the NTSB.

31. On October 2, 2003, I signed and submitted a Declaration describing my role in the TWA flight 800 accident investigation and the development of the animations presented at the public hearing on December 8, 1997. That declaration was made part of the NTSB's Vaughn index filed on October 3, 2003 in the litigation related to the July 31, 2002 request. (CV 02-8708-AHM (RZx) I understand from the Office of General Counsel that the litigation related to the July 31, 2002 request, and a subsequent request dated July 28, 2003, have been dismissed.
32. The FOIA Officer and the Office of General Counsel advised me that Plaintiff filed another FOIA request, dated October 8, 2003, and numbered 2004-0027. This request includes 145 specific requests for records as to the NTSB's "zoom-climb data and calculations," which the Plaintiff has defined in his request as TWA flight 800s "aircraft's continuing to fly after the nose of TWA 800 was blown off, climbing as much as 3,200-feet (the "zoom climbs"). "The FOIA Requests are numbered 4 through 149." (See Exhibit I-1)
33. I reviewed these requests, particularly those referencing the animations that I created. These include the following numbered items from the request: 70-73, 80-83, 90-93, 100-103, 110-113³, 117-120, 124-127, 131-134, 138-141, and 145-148.
34. As I noted earlier, I was not involved in the NTSB's computations of the Main Wreckage Flight Path Study, which is how I interpret Mr. Lahr's reference to a "zoom-climb conclusion" and do not have any records associated with formulas used in the Main

³ The agency interpreted the FOIA letter in the broadest sense, since requests 110-113 seek the computer printout for the simulation program, which clearly was not presented in the animations.

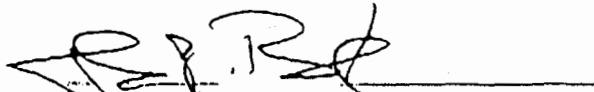
Wreckage Flight Path Study, weight and balance data (FOIA Request subparts 4-68 and 75-78), and the majority of data entered into the computer simulation (FOIA Request subparts 75-78), whether the NTSB conducted the computer simulation in-house or when, where, or by whom the computer simulation was performed (FOIA Request subparts 85-88). In addition, I do not have the computer simulation program used by the NTSB in the Main Wreckage Flight Path Study (FOIA Request subparts 95-98), and do not know if there are any printouts of the computer simulation program code (FOIA Request subparts 105-108). The only information associated with the Main Wreckage Flight Path Study that I utilized in creating the graphic depictions were the following: the verified radar and FDR data (which, I have already indicated in paragraph 17, is publicly available to the requester), the position (in this case where the plane was in the sky) and the orientation (pitch, yaw and roll) of the airplane. The position and orientation data are included in the files that were released to Plaintiff in response to the October 8, 2003 FOIA request numbered 2004-0027.

35. I consider animations to be distinct from simulations. Animations are video depictions of data, whereas simulations create some of the data based upon described parameters. These animations are a visual means of presenting a variety of data, including recorded data from the radar and FDR, and simulated data from the Main Wreckage Flight Path Study. Not all of the parameters used to create the Main Wreckage Flight Path Study were used for the animations; only the position (in this case, where the plane was in the sky), and orientation (pitch, roll and yaw) were used in the four NTSB animations. As stated in paragraphs 10 and 12, these two collections of data were linearly interpolated to 30 times per second.

36. As is also reflected in paragraphs 8, and 11-16, the development of the animations and the computer programs used to create the animations were distinct and separate from the computer simulations involved in the Main Wreckage Flight Path Study.
37. In response to FOIA request numbered 2004-0027, I was asked to search for, and produce to the FOIA Office potentially responsive records to the FOIA request. I searched my office, and the computer systems used to create the animations presented by the NTSB. Following my search and discussions with these offices, the agency initially responded to the request on November 6, 2003. (Exhibit I-2)
38. I provided to the FOIA Office all TWA flight 800 records located from my search related to the creation of the animations shown during the public hearing held on December 8, 1997. These records were provided on two compact disks (CDs), one containing all responsive files from the silicon graphics computer using a UNIX operating system, and one containing all responsive files from my desktop computer system. I did not locate any paper records.
39. Following consultation with my Office Director, Division Chief and me, the NTSB sent a supplemental response to Plaintiff, dated April 13, 2004 (Exhibit I-3), which included or referred all of the records I had located through my search. I maintained two files that contained data provided to me by the Central Intelligence Agency (CIA), and identified those files to the FOIA Office. The FOIA Office and the Office of General Counsel informed me that these files were referred to the CIA, because that was the agency that provided the information.
40. I have been informed by the agency's FOIA Officer and/or a member of the Office of General Counsel that Plaintiff was advised of the existence of the public docket materials and how to order them. Further, I have been informed that Plaintiff received other responsive,

I declare under the penalty of perjury that the foregoing is true and correct.

Executed on this 14th day of May, 2004 in Washington, DC.

A handwritten signature in black ink, appearing to read 'D. Brazy', written over a horizontal line.

Douglass Brazy
Mechanical Engineer, Cockpit Voice Recorder & Video