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9 UNITED STATES DISTRICT COURT
10 FOR THE CENTRAL DISTRICT OF CALIFORNIA
11 WESTERN DIVISION

12 H. RAY LAHR) No. CV 03-08023-AHM (RZx)
13)
13 Plaintiff,)
14)
14 v.) NOTICE OF FILING AND FILING
15) OF AFFIDAVIT OF RICHARD S.
15 NATIONAL TRANSPORTATION) BREUHAUS AND FIRST SUPPLEMENTAL
SAFETY BOARD, CENTRAL) DECLARATION OF DENNIS A. CRIDER
16 INTELLIGENCE AGENCY,)
17)
17 Defendants.)

18
19 PLEASE TAKE NOTICE that defendant National Transportation
20 Safety Board is hereby filing the second Declaration of Richard S.
21 Breuhaus and the First Supplemental Declaration of Dennis A.
22 Crider, as a part of its Vaughn index.

23 DATED: This 16th day of August, 2004.

24 DEBRA W. YANG
United States Attorney
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26 JAN L. LUYMES
Assistant United States Attorney
27 Attorneys for Defendant
National Transportation Safety Board
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UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA
WESTERN DIVISION

CAPTAIN H. RAY LAHR,

Plaintiff,

v.

NATIONAL TRANSPORTATION
SAFETY BOARD, et al.,

Defendants.

CASE NO. CV 03-08023-AHM

**AFFIDAVIT OF
RICHARD S. BREUHAUS**

Richard S. Breuhaus, having been duly sworn, deposes and states as follows:

1. I am Chief Engineer of Air Safety Investigation for The Boeing Company. I am Boeing's primary contact for the National Transportation Safety Board concerning NTSB investigations and I coordinate the technical support that Boeing gives to the NTSB upon request.

2. I am over the age of 21 years and competent to testify herein. The facts stated herein are based on my personal knowledge, on my review and familiarity with Boeing's business records that are maintained in the ordinary course of business, and on my discussions with Boeing employees knowledgeable about and responsible for the documents and activities discussed herein. I would so testify if called to do so.

3. As stated in my previous affidavit filed herein, Boeing voluntarily created NTSB Records 5-9 and 12 during the TWA Flight 800 investigation in response to a request from the NTSB for technical assistance concerning the mass

1 properties, aerodynamic and engine characteristics of the Boeing Model 747-100
2 aircraft.

3 4. NTSB Records 5-9 and 12 contain business and technical information
4 that Boeing does not customarily disclose without appropriate restrictions on use
5 and further disclosure of the information by the recipient, information that is
6 "Boeing Proprietary," and/or third-party proprietary information that is subject to a
7 Proprietary Information Exchange Agreement between Boeing and one of its
8 suppliers. My previous affidavit describes and discusses these records.

9 5. As described more fully in my previous affidavit, NTSB Records 5-9
10 and 12 contain Boeing trade secrets that have independent economic value derived
11 from not being ascertainable or available for use by other parties and are subject to
12 efforts by Boeing to maintain their secrecy. Boeing's competitors, customers, and
13 third parties could use this baseline data to assist them in the design, manufacture,
14 test, and marketing of products and services in direct competition with Boeing,
15 thereby causing competitive harm to Boeing.

16 6. As described more fully in my previous affidavit, I am informed and
17 believe that Boeing developed the baseline mass properties, aerodynamic and engine
18 characteristics presented in or derivable from NTSB Records 5-9 and 12 at great
19 expense using Boeing's proprietary wind tunnel, flight test, and simulator data. This
20 proprietary information is part of its training simulator database. As part of its
21 current business, and for a fee, Boeing licenses its proprietary simulator data to third
22 parties to operate flight simulators for flight training, engineering, and other
23 commercial purposes, sometimes in direct competition with Boeing.

24 7. I have reviewed the October 20, 2002 Affidavit of
25 Brett Mukherjee Hoffstadt, his supplemental affidavit of June 16, 2004, and my own
26 affidavit previously filed herein, and have discussed them with the Boeing engineer
27 primarily responsible for creating NTSB Records 5-9 and 12. The information in
28

1 my previous affidavit is correct as stated and is not contradicted by Mr. Hoffstadt's
2 affidavits.

3 8. Mr. Hoffstadt is correct that computational fluid dynamics (CFD)
4 computer programs are used in the aerospace industry to determine aircraft
5 aerodynamic characteristics. However, I am informed and believe that the
6 proprietary data contained in NTSB Records 5-9 and 12 are not CFD program
7 outputs. In addition, state-of-the-art CFD programs generally do not reproduce
8 aircraft aerodynamics data to the level of accuracy required for all of the
9 commercial purposes for which Boeing and third parties use the data presented in or
10 derivable from NTSB Records 5-9 and 12. Boeing typically validates CFD
11 information using aircraft models in a wind tunnel as well as flight test data. The
12 wind tunnel results are adjusted for scale effects and aerolastic differences, and are
13 then validated through actual flight testing. The final estimated aircraft
14 aerodynamic characteristics are a result of this process.

15 9. Mr. Hoffstadt is not correct that Figures 1, 2, and 3 of the NTSB's Main
16 Wreckage Flight Path Study of TWA Flight 800 contains Boeing's proprietary data
17 on the lift, pitching moment, and drag coefficients of the 747-100 aircraft in either
18 its baseline configuration or the modified configuration that assumes the loss of the
19 aircraft's forward fuselage. These figures, as stated in the body of the study, present
20 only the estimated change in the longitudinal aerodynamic coefficients between the
21 two configurations. In order to derive the 747-100 aerodynamic coefficients from
22 Figures 1, 2, and 3 of the Main Wreckage Flight Path Study, you would also need to
23 know the aerodynamic coefficients of the modified 747-100 configuration. This
24 information is contained in the NTSB Records that are being withheld.

25 10. Mr. Hoffstadt is correct that Page 2 of the Main Wreckage Flight Path
26 Study contains Boeing proprietary data concerning the gross weight, center of
27 gravity, and pitch and roll inertias (the "mass properties") of the 747-100 in baseline
28 and modified configurations. Boeing consented to the publishing of these 747-100

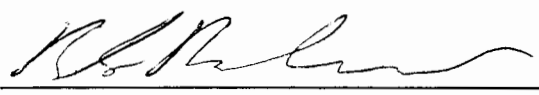
1 mass properties in the NTSB's Main Wreckage Flight Path Study. I am informed
2 and believe that the NTSB is not withholding this information from its response to
3 plaintiff's FOIA request. However, NTSB Record 5 also contains a preliminary
4 statement of the proprietary 747-100 mass properties. I am informed and believe
5 that the NTSB has not previously published the preliminary mass properties data,
6 and Boeing has not consented to the release of NTSB Record 5.

7 11. Mr. Hoffstadt is correct that the basic geometry of the Boeing 747 (its
8 dimensions) is publicly available. However, the 747 geometry is not contained in
9 NTSB Records 5-9 and 12, and consequently is not being withheld by the NTSB in
10 response to plaintiff's FOIA requests.

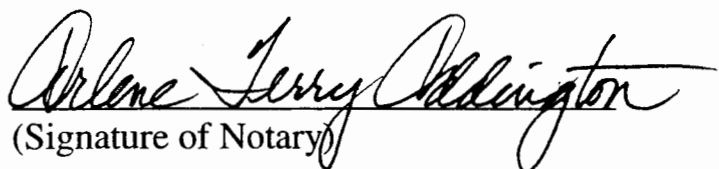
11 12. I have reviewed Mr. Ray Lahr's affidavit filed herein. Mr. Lahr states:
12 "The performance data and the weight and balance data is given to every operator of
13 a Boeing aircraft, and it is generally known by competitors as well. Thus, the
14 detailed operational performance of B-747s is certainly not a secret, being available
15 from at least four sources. 1. Operator Handbooks. 2. B-747 Flight Training
16 Simulator. 3. B-747 Flight Data Recorders. 4. Authoritative treatise [sic]." This
17 does not contradict my previous affidavit, which states that as part of its current
18 business, for compensation, and subject to restrictions on unauthorized use or
19 disclosure, Boeing provides its propriety data to airlines and other third parties to
20 operate flight simulators and for other purposes. To the best of my knowledge,
21 neither 747 flight data recorders nor any authoritative aeronautical treatise contain
22 the specific proprietary information contained in NTSB Records 5-9 and 12.

23 DATED: AUGUST 05 , 2004.

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By 
Richard S. Breuhaus

SUBSCRIBED AND SWORN to before me this 5th day of
AUGUST, 2004.


(Signature of Notary)

ARLENE TERRY ADDINGTON
(Print or Stamp Name of Notary)
NOTARY PUBLIC in and for the State of
Washington, residing at: Seattle, WA
My Commission expires: 10-FEB-07

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

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

FIRST SUPPLEMENTAL DECLARATION OF DENNIS A. CRIDER

I, Dennis A. Crider, 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:

1. The purpose of this declaration is to supplement my earlier declaration filed May 19, 2004 (May declaration), in addressing certain allegations made by Plaintiff in his Opposition to the NTSB's Motion for Summary Judgment. So that it may be easier to understand, as much as possible, the description of the computer program has been written in non-engineering terms. Thus some technical descriptions have not been used in this declaration.
2. In his Opposition to NTSB's Motion for Summary Judgment and his Statement of Genuine Issues, dated August 2, 2004, Plaintiff argues that we have falsely claimed that we cannot segregate Boeing-supplied records. Plaintiff cites his Exhibit A Hoffstadt Affidavit for the proposition that I could

release my simulation program code in a non-executable version after removing Boeing-supplied information. Plaintiff also contests our claim that the simulation program and the two studies are properly withheld pursuant to exemption (b)(5).

3. As part of the NTSB's response to Plaintiff's FOIA requests at issue here, the Safety Board withheld the three executable simulations unique to the TWA flight 800 accident (dated November 14, 1997, January 19, 2000 and June 7, 2000 and discussed below). The executable has the proprietary Boeing data embedded in it for the 737-200, 737-300, and the TWA flight 800-specific 747. The Board also withheld input files and simulation output files produced by the three saved executables that were iteration drafts. This is explained further below. The executables were used to develop the data contained in my reports about TWA flight 800's flight path.
4. The Safety Board is not able to segregate the Boeing data from the executable files. The executable files are in binary machine code (a series of 0s and 1s). Thus, it is not obvious from looking at them what is aircraft-specific, proprietary data, or any other information that was embedded in the simulation. I would not be able, and do not know how, to identify and remove the proprietary data from an executable file.
5. I consider the simulation to be a tool¹. This tool was produced from source files in the C++ programming language. The simulation is an ever-evolving

¹ The simulation program, along with Microsoft Word, Microsoft Excel and two commercial off the shelf plotting programs, was used to create the Main (cont'd.)

program. Thus, with two possible exceptions described in paragraph 6 below, the source files used to create the simulation tool that was used to create the TWA flight 800 Main Wreckage Flight Path studies were not preserved at the time, other than in binary machine language 1's and 0's embedded within the executable. In addition, the current versions of the source code are not the same but have been updated and improved. There is no way to reproduce the source files used to create the simulation executable program that was used to produce the TWA flight 800 studies. Because the simulation is a tool that is not specific to any accident, and the three executables that were saved for TWA flight 800 provided the outputs used in my reports, and embedded in those executables were the source files in binary form, the source files that produced the tool were not preserved.

6. In preparing this declaration, I discovered that I had the last control system source file² and the aerodynamics source file specific to TWA flight 800, which had not been changed as a result of other accident investigations. As I explained above, I consider my simulation source files to be a tool that I use and that evolve over time to accommodate many different aircraft types.

Because these files are a tool that change over time, when I did my initial

Flight Path Study and the subsequent studies. Like Word, Excel and the plotting programs, the simulation tool has been updated with the passage of time. The simulation tool has been used to simulate many different aircraft types, just as Word can be used to create many types of documents.

² In this case, I cannot recall if the control system model was used or if control system changes were manually entered from TWA flight 800 data. In other words, the control system source file need not be used, but the control surfaces may be driven directly.

searches for responsive records, I did not recall that I had these two files which are specific to TWA flight 800 simply because it is the only modeling I have done of an aircraft without the nose portion. The Boeing proprietary data can be redacted from the control system and aerodynamics source files; however, the remainder of the source files still contain considerable deliberative, analytical judgments, as discussed below, and for those reasons, I believe they should not be released to the public. Standing alone, the two source files with the redacted Boeing proprietary data are useless to any reconstruction of my simulation.

7. As discussed in paragraphs 9 and 10 of my May declaration, and in paragraph 3 above, the simulation program contains proprietary information about other aircraft models as well. Prior to including the Boeing 747 data, the simulation contained data concerning the Boeing 737. I have since added data from several other aircraft. The TWA flight 800 executables can simulate the 737-200 and 737-300 generally, as well as TWA flight 800 for that accident flight.
8. Contrary to Plaintiff's assertion that the (b)(5) exemption is improper, the development of the simulation required extensive engineering knowledge and professional judgment. As discussed in general terms above, input files consist of columns of data listing elevator deflection, wheel movement, power, for example, at different points in time. The simulation output files consist of columns of data calculated by the simulation code based on control inputs from the input file. The input files were changed after each simulation output was interpreted and compared to the radar evidence. Thus there are

input and output files that were withheld, all representing different computer runs, which attempted to line up the aircraft inputs in such a way as to best represent the action of the aircraft as reflected by the radar data. This must be done many times, working forward in accident time to match the locations the radar indicated at these different points in time. Each simulation builds on the earlier accident times matched in previous runs.

9. This process is an iterative one, requiring deliberative analysis. For example, if a particular run of input data results in an output simulation that is similar but not exact enough to replicate the actual radar data, I would make various adjustments in the inputted data, and then perform the run again to determine if the result was closer to the movement of the objects as indicated in the radar data. I repeated this process until the simulation output reflected as best as possible the radar data.
10. The withheld input and output files reflect application of my engineering knowledge and professional judgment to determine whether the program is operating as designed, and whether it is representing and utilizing the data appropriately. This is a deliberative, analytical process in which staff must be free to adjust and experiment without fear that staff work at whatever stage will be released and compared to the Safety Board's ultimate conclusions, as represented in the Board Members' final decision, the Aircraft Accident Report.
11. As should be clear from the process described above, not only are the final input and output files withheld, but also withheld are earlier versions of the

data on the way to producing the final. Each iteration of the data produces a set of files, each representing the evolution of the simulation. These iterations are drafts.

12. In addition to the input and output files being deliberative, the output files also contain proprietary information. It would be possible, using the final data and the information published in my studies contained in the public docket (i.e., the “deltas,” the changes in aerodynamics from a normal 747 to one in a nose-off state) to work backwards and reconstruct some of the Boeing proprietary data for an intact 747.
13. Plaintiff alleges in pages 7-8 of his Opposition that, because the Board released some aircraft specific weight and inertia data, its withholding of other data is improper. However, the data withheld are not the same data that were released in the public docket, and to Mr. Lahr in response to his FOIA requests. There has been no official disclosure of information that duplicates the specific information withheld. In addition the data withheld were preliminary data that were not relied upon and would cause confusion and uncertainty if released.
14. To supplement paragraph 13 of my May declaration, I did not provide the Central Intelligence Agency with any of the data I received from Boeing, including the aerodynamics, propulsion, geometry, controls, mass properties and so on of the aircraft.

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

Executed on this 13 day of August, 2004 in Washington, D.C.

Dennis A. Crider

Dennis A. Crider

National Resource Specialist, Vehicle Simulation