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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 )  
Plaintiff, )  
14 )  
v. ) NOTICE OF FILING AND FILING  
15 ) OF SUPPLEMENTAL AFFIDAVIT OF  
NATIONAL TRANSPORTATION ) RICHARD BREUHAUS  
16 )  
SAFETY BOARD, CENTRAL )  
17 )  
INTELLIGENCE AGENCY, )  
Defendants. )

18  
19 In accordance with the Court's direction on September 27,  
20 2004, please take notice that defendant National Transportation  
21 Safety Board is hereby filing the supplemental affidavit of Richard  
22 S. Breuhaus as a part of its Vaughn index.

23 DATED: This 12th day of October, 2004.

24 DEBRA W. YANG  
United States Attorney

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JAN L. LUYMES  
Assistant United States Attorney  
27 Attorneys for Defendant  
National Transportation Safety Board  
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1 UNITED STATES DISTRICT COURT  
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3 CENTRAL DISTRICT OF CALIFORNIA  
4  
5 WESTERN DIVISION

6 CAPTAIN H. RAY LAHR,

7 Plaintiff,

8 v.

9 NATIONAL TRANSPORTATION  
10 SAFETY BOARD, et al.,

11 Defendants.

CASE NO. CV 03-08023-AHM

**SUPPLEMENTAL AFFIDAVIT  
OF RICHARD S. BREUHAUS**

12  
13 Richard S. Breuhaus, having been duly sworn, deposes and states as follows:

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

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

24 3. Boeing voluntarily created NTSB Records 5-9 and 12 during the TWA  
25 Flight 800 investigation in response to a request from the NTSB for technical  
26 assistance concerning the mass properties, aerodynamic and engine characteristics  
27 of the Boeing Model 747-100 aircraft. Because public disclosure of these trade  
28

1 secrets and other proprietary information could cause Boeing competitive harm,  
2 Boeing provided them to the NTSB under the belief and understanding that the  
3 NTSB would disclose it only if necessary for the health or safety of the flying  
4 public, and, if disclosure were necessary, that the NTSB would take all measures  
5 available to lessen the resulting competitive harm to Boeing.

6 4. NTSB Records 5-9 and 12 contain business and technical information  
7 about the baseline mass properties, aerodynamic and engine characteristics of the  
8 Boeing Model 747-100 aircraft, information that is "Boeing Proprietary," and/or  
9 third-party proprietary information that is subject to a Proprietary Information  
10 Exchange Agreement between Boeing and one of its suppliers. Boeing does not  
11 customarily disclose this information without appropriate restrictions on use and  
12 further disclosure of the information by the recipient.

13 5. Boeing engineers and technical staff create, access, and use trade  
14 secrets and other proprietary information that have independent economic value to  
15 Boeing because they are not freely ascertainable or publicly available for use by  
16 other parties. Boeing therefore has procedures to limit disclosure and dissemination  
17 of this information. Boeing requires its employees to mark certain types of  
18 proprietary information as "Boeing Proprietary" and to protect it from unauthorized  
19 use and disclosure by appropriate agreements. Boeing employees are instructed not  
20 to disclose Boeing's business and technical information without appropriate  
21 restrictions on use and further disclosure of the information by the recipient. Boeing  
22 employees are instructed to treat third-party proprietary information in accordance  
23 with the agreement under which it was furnished to the company. In addition,  
24 Boeing employees enter into a Proprietary Information and Invention Agreement,  
25 which safeguards proprietary information belonging either to Boeing or to a third  
26 party that has authorized Boeing to use its proprietary information.

27 6. As part of its current business, and for a fee, Boeing licenses its  
28 proprietary simulator data to third parties to operate flight simulators for flight

1 training, engineering, and other commercial purposes, sometimes in direct  
2 competition with Boeing. I am informed and believe that these licenses restrict  
3 unauthorized use or disclosure of Boeing's proprietary information.

4 7. NTSB Records 5-9 and 12 contain Boeing trade secrets that have  
5 independent economic value derived from not being ascertainable or available for  
6 use by other parties and are subject to efforts by Boeing to maintain their secrecy.  
7 Boeing's competitors, customers, and third parties could use this baseline data to  
8 design, manufacture, test, and market products and services in direct competition  
9 with Boeing, thereby causing competitive harm to Boeing.

10 8. I am informed and believe that Boeing developed the baseline mass  
11 properties, aerodynamic and engine characteristics presented in or derivable from  
12 NTSB Records 5-9 and 12 at great expense using Boeing's proprietary wind tunnel,  
13 flight test, and simulator data. This proprietary information is part of Boeing's  
14 training simulator database, and is presented in or can be derived using NTSB  
15 Records 5-9 and 12.

16 9. I am informed and believe that the proprietary data contained in NTSB  
17 Records 5-9 and 12 are not computational fluid dynamics (CFD) program outputs,  
18 and that state-of-the-art CFD programs cannot reproduce aircraft aerodynamics data  
19 to the level of accuracy required for all of the commercial purposes for which  
20 Boeing and third parties use the data presented in or derivable from NTSB Records  
21 5-9 and 12. Boeing verifies its preliminary CFD information using aircraft models  
22 in a wind tunnel. The wind tunnel results are adjusted for scale effects and  
23 aerolastic differences, and are then verified through actual flight testing. Boeing  
24 then extracts the aircraft's aerodynamic characteristics from the flight test data.

25 10. Boeing Model 747-100 and Model 747-200 aircraft are  
26 aerodynamically identical, and the Boeing Model 747-300 aircraft is almost  
27 identical to the Model 747-100 and the Model 747-200. These models are  
28 collectively called the 747 Classic. Because of the aerodynamic similarity among

1 all 747 Classic aircraft, Boeing sells the same proprietary simulator data package to  
2 support owners and operators of 747-100, 747-200, and 747-300 model aircraft and  
3 flight simulators.

4 11. According to Boeing records, there are approximately 104 Model 747-  
5 100 aircraft, 320 Model 747-200 aircraft, and 77 Model 747-300 aircraft available  
6 for service around the world. For example, the two aircraft commonly known as  
7 "Air Force One" and the Air Force's four Advanced Airborne Command Post  
8 aircraft are all 747 Classics.

9 12. During development of the Model 747-100 aircraft in the 1960s,  
10 Boeing invested enormous resources into creating the aerodynamic data in Boeing's  
11 training simulator database. As recently as 1992, Boeing invested several million  
12 dollars to update its 747 Classic simulator data package to enhance the fidelity of the  
13 match between flight simulation and actual flight. This proprietary information has  
14 independent economic value to Boeing because it is not readily ascertainable or  
15 freely available for use by aircraft operators, aircraft designers and manufacturers,  
16 flight training companies, engineering firms, or the general public.

17 13. A commercial party or member of the general public who wants to use  
18 the information in Boeing's flight simulator database (for whatever reason) has two  
19 choices: Purchase a license from Boeing to use the data, or attempt to reproduce  
20 Boeing's data using computer modeling, wind tunnel testing, and flight test  
21 verification. In addition, using non-Boeing data to operate a certified 747 Classic  
22 flight simulator would also require a competitor to obtain approval of the simulator  
23 from their national aviation regulatory agency (e.g. the FAA for U.S. operators)  
24 after proving that their simulator flight characteristics very closely match the actual  
25 flight characteristics of the aircraft.

26 14. A competitor attempting to reproduce Boeing's data and sell its own  
27 version of Boeing's 747 Classic simulator data package would need to make an  
28 investment in the order of magnitude of \$20,000,000 in development costs. Free

1 access to the proprietary data in NTSB Records 5-9 and 12 would assist in this  
2 effort.

3 15. To date, Boeing is aware of no company that has invested the resources  
4 necessary to reproduce Boeing's 747 Classic training simulator database; Boeing  
5 remains the sole source for this information.

6 16. If a Boeing customer or a member of the general public contracted with  
7 Boeing to reproduce the proprietary data in NTSB Records 5-9 and 12, the cost  
8 would be in the order of magnitude of \$100,000. Boeing would require appropriate  
9 restrictions on use and further disclosure of the information by the recipient.

10 17. As part of its current business, Boeing offers a variety of goods and  
11 services to the owners and operators of the 501 747 Classic aircraft that are currently  
12 available for service throughout the world. Boeing and others use the proprietary  
13 information in Boeing's training simulator database to operate 747 Classic flight  
14 simulators for various purposes, including flight training, aircraft certification, and  
15 engineering. In providing these services, Boeing competes with other companies  
16 and enjoys a competitive advantage because it is the sole source of the training  
17 simulator data.

18 18. A wholly-owned subsidiary of Boeing is an industry leader in  
19 providing aviation training, including training on the 747 Classic aircraft. These  
20 training services include courses that rely on the use of 747 Classic flight simulators,  
21 which use proprietary information from Boeing's training simulator database. Some  
22 of this information is presented in, or can be derived from, NTSB Records 5-9 and  
23 12. These 747 Classic training services include:

- 24 • Flight Simulator Dry Lease
- 25 • Type Rating Training
- 26 • Recurrent Training and Proficiency Check
- 27 • Flight Engineer Initial Equipment/Transition Training
- 28 • Flight Engineer Recurrent Training

1           19. In 2003 alone, Boeing's flight training subsidiary trained approximately  
2 290 pilots to operate the 747 Classic, and leased its 747 Classic simulators for the  
3 training of approximately 530 additional 747 Classic pilots. These services  
4 produced approximately \$7,000,000 in revenue in 2003.

5           20. A number of flight crew training companies and air carriers compete  
6 with Boeing in the flight training market by operating certified 747 Classic flight  
7 simulators. As far as Boeing is aware, all of these flight simulators use Boeing's  
8 747 Classic simulator data package; Boeing is aware of no other source for this data.

9           21. As part of its current business, Boeing licenses its 747 Classic  
10 simulator data package to third parties, which enables them to operate 747 Classic  
11 flight simulators in competition with Boeing. Operators of 747 Classic flight  
12 simulators typically purchase an updated simulator data package from Boeing when  
13 they purchase a new flight simulator, purchase a used flight simulator, or upgrade an  
14 existing flight simulator. Since 1991, Boeing has sold ten 747 Classic simulator  
15 data package licenses. Boeing most recently sold a 747 Classic simulator data  
16 package license in February 2001. The current price for purchasing a 747 Classic  
17 simulator data package license for a simulator capable of meeting Level C  
18 regulatory approval standards is approximately \$1,000,000.

19           22. Use of the Boeing's training simulator database is not limited to flight  
20 crew training. Boeing also uses the proprietary information in its database for  
21 engineering and certification purposes. If a commercial owner or operator modifies  
22 a Model 747-100 aircraft in any way that could significantly affect the aircraft's  
23 mass properties or aerodynamic characteristics, it cannot operate the aircraft in the  
24 United States without first securing an Airworthiness Certificate from the FAA.  
25 This requires the aircraft's owner or operator to either prove to the FAA that the  
26 modified aircraft conforms to the "Type Certificate" for the Model 747-100 aircraft  
27 (which is owned by Boeing), or have the FAA approve a "Supplemental Type  
28 Certificate" for the proposed modification.

1           23. Boeing offers engineering services to the owners and operators of 747  
2 Classic aircraft in support of their efforts to secure Airworthiness Certificates for  
3 modified Model 747 aircraft. Using the proprietary data in its training simulator  
4 database, Boeing can in some cases show that the proposed modification does not  
5 adversely affect the aircraft's mass properties or aerodynamic characteristics, and  
6 thereby establish that the modified aircraft conforms to Boeing's Type Certificate.  
7 In other cases, Boeing provides engineering services (including the use of its  
8 proprietary training simulator database) to the owners and operators of modified 747  
9 Classic aircraft in order to enable them to secure a Supplemental Type Certificate  
10 from the FAA for their modified 747 Classic aircraft.

11           24. A recent example of Boeing using its training simulator database to sell  
12 engineering services involves a Boeing customer who has proposed modifying  
13 Model 747-100 aircraft for use as aerial tankers to fight forest fires. In about 2002,  
14 this customer contracted with Boeing to analyze the Model 747-100 would respond  
15 aerodynamically to the sudden decrease in aircraft mass following release of 24,000  
16 gallons (200,000 lbs) of fire retardant. Boeing used the proprietary data in its  
17 training simulator database to analyze this question and to support its customer's  
18 efforts to secure FAA certification for this modified 747 Classic.

19           25. Because Boeing invested substantial resources up-front to determine  
20 and prove the mass properties and aerodynamic characteristics of the Model 747-  
21 100 aircraft, and because Boeing invested additional resources to update that data in  
22 1992, Boeing can offer its engineering services to owners and operators of 747  
23 Classic aircraft, including modified aircraft, at competitive rates.

24           26. NTSB Record 5 contains proprietary data concerning the mass  
25 properties (aircraft gross weight, center of gravity, and pitch and roll inertias) of the  
26 Boeing Model 747-100 aircraft in two configurations: the baseline configuration  
27 and a hypothetical configuration in which the aircraft's forward fuselage has been  
28 removed. This is business and technical information that Boeing does not



1 customarily disclose without appropriate restrictions on use and further disclosure of  
2 the information by the recipient.

3 27. The National Transportation Safety Board's Main Wreckage Flight Path  
4 Study on TWA Flight 800 is publicly available. Page 2 of the Main Wreckage  
5 Flight Path Study contains Boeing proprietary data concerning the gross weight,  
6 center of gravity, and pitch and roll inertias (the "mass properties") of the 747-100  
7 in baseline and modified configurations. Boeing consented to the publishing of the  
8 final 747-100 mass properties in the NTSB's Main Wreckage Flight Path Study. I  
9 am informed and believe that the NTSB already has produced Boeing's source  
10 document for these data in response to plaintiff's FOIA request. NTSB Record 5  
11 contains preliminary Model 747-100 mass properties. I am informed and believe  
12 that the NTSB has not previously published the preliminary mass properties data,  
13 and Boeing has not consented to the release of NTSB Record 5.

14 28. NTSB Record 6 presents in graph and table format the lift coefficient  
15 and pitching moment coefficient of the Boeing Model 747-100 aircraft in two  
16 configurations: the aircraft's baseline configuration and a hypothetical configuration  
17 in which the aircraft's forward fuselage has been removed. NTSB Record 6 contains  
18 Boeing proprietary information; each page of NTSB Record 6 is marked "Boeing  
19 Proprietary" and "Preliminary."

20 29. The baseline lift coefficient and pitching moment coefficient data in  
21 NTSB Record 6 were produced using Boeing's proprietary training simulator  
22 database. Because these coefficients are necessary to model an aircraft's flight  
23 characteristics, they are a core part of Boeing's proprietary training simulator  
24 database. As discussed above, Boeing benefits commercially from being the sole  
25 source of its 747 Classic simulator data package, which it uses as part of its current  
26 business, in competition with others, to sell flight training services, simulator data  
27 package licenses, flight simulator leases, and engineering services.

1           30. A competent engineer with access to the hypothetical configuration  
2 represented in the graphs and tables in NTSB Record 6 could determine the baseline  
3 lift coefficient and pitching moment coefficient for the Boeing Model 747-100/200  
4 aircraft, which would reduce the market value of both Boeing's proprietary 747  
5 Classic simulator data package and its training, engineering, and certification  
6 services that rely on Boeing's proprietary training simulator database.

7           31. NTSB Record 7 is a graph showing the corrected net thrust at  
8 maximum power lever angle for the engines used on the TWA Flight 800 Model  
9 747-100 aircraft. It contains Boeing proprietary information and also third-party  
10 proprietary information that is subject to a Proprietary Information Exchange  
11 Agreement between Boeing and one of its suppliers.

12           32. The engine thrust data in NTSB Record 7 are necessary to model an  
13 aircraft's flight characteristics. These data are a core part of Boeing's proprietary  
14 training simulator database. Boeing benefits commercially from being the sole  
15 source of its 747 Classic simulator data package, which it uses as part of its current  
16 business, in competition with others, to sell flight training services, simulator data  
17 package licenses, flight simulator leases, and engineering services.

18           33. Free public disclosure of the Boeing Model 747-100 engine thrust data  
19 in NTSB Record 7 would reduce the market value of both Boeing's proprietary 747  
20 Classic simulator data package and its training, engineering, and certification  
21 services that rely on Boeing's proprietary training simulator database. In addition,  
22 Boeing's future access to its suppliers' proprietary information could be impaired if  
23 the third-party proprietary information in NTSB Record 7 is publicly disclosed  
24 notwithstanding the Proprietary Information Exchange Agreement between Boeing  
25 and its supplier.

26           34. NTSB Record 8 presents in graph and table format the lift coefficient,  
27 pitching moment coefficient, and drag coefficient of the Boeing Model 747-100  
28 aircraft in two configurations: the baseline configuration and a hypothetical

1 configuration in which the aircraft's forward fuselage has been removed. NTSB  
2 Record 8 contains Boeing proprietary information; each page of NTSB Record 8 is  
3 marked "Boeing Proprietary" and "Preliminary."

4 35. Figures 1, 2, and 3 of the NTSB's Main Wreckage Flight Path Study on  
5 TWA Flight 800 contains Boeing's proprietary data on the lift, pitching moment,  
6 and drag coefficients of the Model 747-100 aircraft in either its baseline  
7 configuration or the modified configuration that assumes the loss of the aircraft's  
8 forward fuselage. These figures, as stated in the body of the study, present only the  
9 estimated change in the longitudinal aerodynamic coefficients between the two  
10 configurations. In order to derive the 747-100 aerodynamic coefficients from  
11 Figures 1, 2, and 3 of the Main Wreckage Flight Path Study, you would also need to  
12 know the aerodynamic coefficients of the modified 747-100 configuration. This  
13 information is contained in the NTSB Records that are being withheld.

14 36. The baseline lift coefficient, drag coefficient, and pitching moment  
15 coefficient data in NTSB Record 8 were produced using Boeing's proprietary  
16 training simulator database. Because these coefficients are necessary to model an  
17 aircraft's flight characteristics, they are a core part of Boeing's proprietary training  
18 simulator database. As discussed above, Boeing benefits commercially from being  
19 the sole source of its 747 Classic simulator data package, which it uses as part of its  
20 current business, in competition with others, to sell flight training services, simulator  
21 data package licenses, flight simulator leases, and engineering services.

22 37. A competent engineer with access to the hypothetical configuration  
23 represented in the graphs and tables in NTSB Record 8 could determine the baseline  
24 lift coefficient and pitching moment coefficient for the Boeing Model 747-100/200  
25 aircraft, which would reduce the market value of both Boeing's proprietary  
26 747 Classic simulator data package and its training, engineering, and certification  
27 services that rely on Boeing's proprietary training simulator database.  
28

1           38.   NTSB Record 9 is a preliminary graph of the free response of a Boeing  
2 Model 747-100 aircraft upon sudden loss of its forward fuselage; it shows the  
3 possible result of changes in mass properties, aerodynamic characteristics, and thrust  
4 settings. Boeing proprietary information and third-party proprietary information is  
5 included in this preliminary graph and can be determined from this preliminary  
6 graph. The third-party proprietary information that is incorporated into this graph is  
7 subject to a Proprietary Information Exchange Agreement between Boeing and one  
8 of its suppliers.

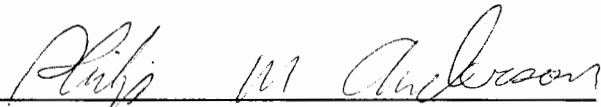
9           39.   The engine thrust and aerodynamic data in NTSB Record 9 were  
10 produced using Boeing's proprietary training simulator database. Because these data  
11 are necessary to model an aircraft's flight characteristics, they are a core part of  
12 Boeing's proprietary training simulator database. As discussed above, Boeing  
13 benefits commercially from being the sole source of its 747 Classic simulator data  
14 package, which it uses as part of its current business, in competition with others, to  
15 sell flight training services, simulator data package licenses, flight simulator leases,  
16 and engineering services. In addition, Boeing's future use of proprietary information  
17 provided by its suppliers could be impaired if the third-party proprietary information  
18 in NTSB Record 9 is publicly disclosed notwithstanding the Proprietary Information  
19 Exchange Agreement between Boeing and its supplier.

20           40.   NTSB Record 12 records a string of emails between Boeing and the  
21 NTSB in which the NTSB requests and Boeing provides the possible ranges for the  
22 proprietary lift coefficient, drag coefficient, and pitching moment coefficient data  
23 that Boeing provided to the NTSB in NTSB Records 5-9. This is business and  
24 technical information that Boeing does not customarily disclose without appropriate  
25 restrictions on use and further disclosure of the information by the recipient.  
26  
27  
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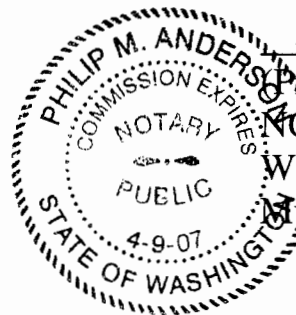
1 41. NTSB Record 12 gives data range information about the lift coefficient,  
2 drag coefficient, and pitching moment coefficient data in NTSB Records 5-9. These  
3 range data were produced using Boeing's proprietary training simulator database,  
4 which is business and technical information that Boeing does not customarily  
5 disclose without appropriate restrictions on use and further disclosure of the  
6 information by the recipient. As discussed above, Boeing benefits commercially  
7 from being the sole source of its 747 Classic simulator data package, which it uses  
8 as part of its current business, in competition with others, to sell flight training  
9 services, simulator data package licenses, flight simulator dry leases, and  
10 engineering services. DATED: October 11<sup>th</sup>, 2004

11  
12  
13 By   
14 Richard S. Breuhaus

15  
16 SUBSCRIBED AND SWORN to before me this 11<sup>th</sup> day of October, 2004.

17   
18 (Signature of Notary)

19 PHILIP M. ANDERSON



20 (Print or Stamp Name of Notary)  
21 NOTARY PUBLIC in and for the State of  
22 Washington, residing at: SEATTLE  
23 Commission expires: 04-09-07