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United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353)

RESPONSE OF THE UNITED STATES TO THE THIRD SET OF QUESTIONS FROM THE PANEL TO THE PARTIES

July 31, 2009

TABLE OF REPORTS AND OTHER DOCUMENTS

Short Form	Full Citation
Brazil – Aircraft (Article 21.5) (AB)	Appellate Body Report, *Brazil – Export Financing Programme for Aircraft – Recourse by Canada to Article 21.5 of the DSU*, WT/DS46/AB/RW, adopted 4 August 2000
Brazil – Aircraft (Article 21.5 II)	Panel Report, *Brazil – Export Financing Programme for Aircraft – Second Recourse by Canada to Article 21.5 of the DSU*, WT/DS46/RW/2, adopted August 23, 2001
Brazil –Desiccated Coconut	*Brazil – Measures Affecting Desiccated Coconut*, WT/DS22/AB/R, adopted 20 March 1997
Brazil – Tyres (AB)	Appellate Body Report, *Brazil – Measures Affecting Imports of Tyres*, WT/DS332/AB/R, adopted 17 December 2007
Canada – Aircraft (AB)	Appellate Body Report, *Canada – Measures Affecting the Export of Civilian Aircraft*, WT/DS70/AB/R, adopted 20 August 1999
Canada – Aircraft (Panel)	Panel Report, *Canada – Measures Affecting the Export of Civilian Aircraft*, WT/DS70/R, adopted 20 August 1999, as modified by the Appellate Body Report, WT/DS70
Canada – Wheat Exports (AB)	Appellate Body Report, *Canada – Measures Relating to Exports of Wheat and Treatment of Imported Grain*, WT/DS276/AB/R, adopted 27 September 2004
Chile – Price Band System (21.5) (AB)	Appellate Body Report, *Chile – Price Band System and Safeguard Measures Relating to Certain Agricultural Products – Recourse to Article 21.5 of the DSU by Argentina*, WT/DS207/AB/RW, adopted 22 May 2007
EC – Asbestos (AB)	Appellate Body Report, *European Communities – Measures Affecting Asbestos and Products Containing Asbestos*, WT/DS135/AB/R, adopted 5 April 2001
EC – Chicken Cuts (AB)	Appellate Body Report, *European Communities - Customs Classification of Frozen Boneless Chicken Cuts*, WT/DS269/AB/R, WT/DS286/AB/R, adopted 27 September 2005
EC – DRAMS	Panel Report, *European Communities – Countervailing Measures on Dynamic Random Access Memory Chips from Korea*, WT/DS299/R, adopted 3 August 2005

EC – Hormones (AB)	Appellate Body Report, *European Communities – Measures Concerning Meat and Meat Products (Hormones)*, WT/DS26/AB/R, WT/DS48/AB/R, adopted 13 February 1998
EC Comments on US RPQ XXX	Comments by the European Communities on the US Responses to Questions of the Panel Following the Panel's First Substantive Meeting with the Parties (December 21, 2007); Comments by the European Communities on the US Responses to Questions of the Panel Following the Panel's Second Substantive Meeting with the Parties (May 5, 2008)
EC FWS	First Written Submission of the European Communities, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS 353)* (Feb. 9, 2007)
EC FNCOS	Oral Statement by the European Communities at the First Substantive Meeting of the Panel with the Parties – Non-Confidential Session, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS353)* (September 28, 2007)
EC SNCOS	Non-Confidential Oral Statement by the European Communities at the Second Substantive Meeting of the Panel with the Parties – Non-Confidential Session, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS353)* (January 16, 2008)
EC RPQ XXX	Answers by the European Communities to Questions of the Panel Following the Panel's First Substantive Meeting with the Parties (December 5, 2007); Answers by the European Communities to Questions of the Panel Following the Panel's Second Substantive Meeting with the Parties (April 14, 2008)
EC SWS	Second Written Submission of the European Communities, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS 353)* (Nov. 19, 2007)
India – Patents	*India – Patent Protection for Pharmaceutical and Agricultural Chemical Products*, WT/DS50/AB/R (19 Dec. 1997)
Korea – Shipbuilding	Panel Report, *Korea – Measures Affecting Trade in Commercial Vessels*, WT/DS273/R, adopted 11 April 2005
New Shorter Oxford English Dictionary	*The New Shorter Oxford English Dictionary on Historical Principles* (Clarendon Press, Oxford) (1993)

US – DRAMS CVD (AB)	Appellate Body Report, *United States – Countervailing Duty Investigation on Dynamic Random Access Memory Semiconductors (DRAMS) from Korea*, WT/DS296/AB/R, adopted 20 July 2005
US – Gambling (AB)	Appellate Body Report, *United States – Measures Affecting the Cross-Border Supply of Gambling and Betting Services*, WT/DS285/R, adopted 20 April 2005
US – Section 301	Panel Report, *United States – Sections 301-310 of the Trade Act of 1974*, WT/DS152/R, adopted 27 January 2000
US – Softwood Lumber CVD Final (AB)	Appellate Body Report, *United States – Final Countervailing Duty Determination with Respect to Certain Softwood Lumber from Canada*, WT/DS257/AB/R, adopted 17 February 2004
US – Softwood Lumber CVD Final (Panel)	Panel Report, *United States – Final Countervailing Duty Determination with Respect to Certain Softwood Lumber from Canada*, WT/DS257/R and Corr.1, adopted 17 February 2004, as modified by the Appellate Body Report, WT/DS257
US – Cotton Subsidies (AB)	Appellate Body Report, United States - Subsidies on Upland Cotton, WT/DS267/AB/R, adopted 21 March 2005
US – Cotton Subsidies (Panel)	Panel Report, *United States – Subsidies on Upland Cotton*, WT/DS267/R, adopted 21 March 2005, as modified by the Appellate Body Report, WT/DS267/AB/R
US – Cotton (21.5) (AB)	Appellate Body Report, *United States – Subsidies on Upland Cotton – Recourse to Article 21.5 of the DSU by Brazil*, WT/DS267/AB/RW, adopted 20 June 2008
US – Wool Shirts (AB)	Appellate Body Report, *United States – Measure Affecting Imports of Woven Wool Shirts and Blouses from India*, WT/DS33/AB/R and Corr.1, adopted 23 May 1997
US Comments on EC RPQ XXX	Comments of the United States on the Response of the European Communities to the First Set of Questions from the Panel to the Parties (December 21, 2007); and Comments of the United States on the Response of the European Communities to the Second Set of Questions from the Panel to the Parties (May 5, 2008)
US FWS	First Written Submission by the United States, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353)* (July 6, 2007)

US FNCOS	Oral Statement of the United States at the First Substantive Meeting of the Panel with the Parties, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353)* (September 26, 2007)
US SNCOS	Oral Statement of the United States at the Second Substantive Meeting of the Panel with the Parties, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint) (DS353)* (January 16, 2008)
US RPQ XXX	Response of the United States to the First Set of Questions from the Panel to the Parties (December 5, 2007); Response of the United States to the Second Set of Questions from the Panel to the Parties (April 14, 2008)
US SWS	Second Written Submission of the United States, *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)(DS 353)* (Feb. 9, 2007)

I. GENERAL ISSUES

A. "BEST INFORMATION AVAILABLE"

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B. TERMS OF REFERENCE

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II. SUBSIDY PROGRAMMES

319. Regarding the allocation of "data rights" under NASA and DOD procurement contracts, please indicate whether the Panel is correct in its understanding that:

*(a) contractors (e.g. Boeing) are "allowed to retain ownership of the technical data and computer software it developed; and the Government receives only a license to use that technical data and computer software" (*Intellectual Property: Navigating Through Commercial Waters, Issues and Solutions When Negotiating Intellectual Property With Commercial Companies*, Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, 15 October 2001 (EC-557)), at 1-3, 1-4);*

1. The Panel's understanding is correct as a general matter. However, the rights that the government receives under these licenses are quite broad, and satisfy its objectives in purchasing the research – to develop and utilize data and software. For example, in all transactions, the government receives "unlimited rights" with regard to certain categories of data, such as "form, fit, and function" data.[1] If a U.S. government agency fully funds development of technical data or computer software, the government receives "unlimited rights" for *all* of the data and software that result from the contract. As the document cited by the EC makes clear, unlimited rights allow *any* U.S. government agency *unlimited* use of the data and software for any purpose it considers appropriate, both inside and outside of the government, for government and commercial uses.[2] Those rights include the right to make the data available to another contractor, or to use them for further internal research that either itself or the knowledge

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[1] Specifically, the regulations provide unlimited rights in all of the following, except if it is copyrights:

(1) Data first produced in the performance of a contract (except to the extent such data constitute minor modifications to data that are limited rights data or restricted computer software); (2) form, fit, and function data delivered under contract; (3) data (except as may be included with restricted computer software) that constitute manuals or instructional and training material for installation, operation, or routine maintenance and repair of items, components, or processes delivered or furnished for use under a contract; and (4) all other data delivered under the contract other than limited rights data or restricted computer software.

48 C.F.R. § 207.404 (Exhibit US-147).

[2] *Intellectual Property: Navigating Through Commercial Waters*, p. 2-13 (Oct. 15, 2001) (Exhibit EC-557); US FWS, para. 350.

generated in its use becomes part of the public domain. Therefore, from the government's perspective, these rights are the functional equivalent of owning the data or software.[3]

2. Even when the agency funds only part of the development of the data or software, the government receives rights under its license that satisfy its objectives of paying no more than necessary for the development of what it needs for its own purposes. Under a DoD contract, the government still receives "government purpose rights" in the data or software, which allow unlimited use within the government, and use for government purposes outside of government.[4] In addition, the government still receives unlimited rights for form, fit, and function data.[5] Under contracts awarded by agencies other than DoD, including NASA, even when the government partially funds development, it still receives *un*limited rights for form, fit, or function data and other data first produced under the contract.[6] And finally, for data that a contractor developed fully with its own funds, the government still receives "limited rights" in data fully developed with contractor funds that embody trade secrets, are commercial, are financial, or otherwise confidential, allowing unlimited use within government, with strict limitations on use outside the government.[7]

3. Moreover, both DoD and NASA also have the option of entering into specifically negotiated license agreements. The DoD regulations provide that these are an option for particular situations when "the customary deliverables or standard license rights do not adequately balance the interests of the contractor and the Government."[8] The regulations applicable to other agencies do not spell out prerequisites, but give agencies the latitude to negotiate particularized license terms when the contractors pay part of the development cost. Under this rubric, agencies may agree to an allocation of rights different from those specifically

[3] The chief difference is that the government, as license holder, does not have the right to prevent other parties' use of the data or software. This right, however, is irrelevant to the reason that the government enters into the transaction – to obtain use of the data or software for its own purposes.

[4] Although one agency negotiates a contract, any rights under the contract accrue to the U.S. government as a whole.

[5] *Intellectual Property: Navigating Through Commercial Waters*, p. 2-13 (Oct. 15, 2001) (Exhibit EC-557).

[6] 48 C.F.R. § 27.404(a) (Exhibit US-147). There are some exceptions to this rule, which appear in 48 C.F.R. § 27.404(f).

[7] 48 C.F.R. § 27.402 (Exhibit US-147). For example, the government may allow non-governmental access to limited rights data when necessary for emergency repair or overhaul of equipment. (The textbook example of the repair scenario would be when the government obtains limited rights in technical specifications related to government-owned equipment, and conveys them to a commercial technician for purposes of repairing that equipment.)

[8] *Intellectual Property: Navigating Through Commercial Waters*, p. 2-8 (Oct. 15, 2001) (Exhibit EC-557).

set out in the regulations, but must at the very least secure for the government limited rights or better for data and restricted rights or better in noncommercial software.[9]

4. This framework for the division of data and software rights follows the policy, stated in the U.S. government procurement regulations, that "agencies shall strike a balance between the Government's need and the contractor's legitimate proprietary interest."[10] DoD procurement regulations put the matter more succinctly, stating "DoD policy is to acquire only the technical data, and the rights in that data, necessary to satisfy agency needs."[11] Accordingly, the DoD intellectual property negotiating handbook, which this question quotes, states that "{a} one-size-fits-all agreement will likely include terms and conditions that are inapplicable or irrelevant to a particular acquisition or program. This creates inefficiencies and may force parties to take unnecessarily restrictive positions on other negotiating terms (e.g. price) to account for the imbalance."[12] By taking only the rights it needs and leaving the rest to the contractor, the government follows the eminently commercial practice of buying – and paying – no more than necessary.

> *(b) the US government permits contractors (e.g. Boeing) to retain rights to software and other technical data in order "to assist in the transfer of {Federally funded} technology to the marketplace" (1987 Executive Order entitled "Facilitating access to science and technology" (EC-561), at s. 1(a) and 1(b)(6)).*

5. The Panel is partially correct, in that section 1(a) of Executive Order 12591 states *one* element of U.S. government policy toward federally funded development of technical data and software. Section 1(b)(6), however, addresses a different and equally important policy objective – obtaining "royalty free" use of any software, engineering drawings, or other technical data developed with full or even partial federal funding. These two policy objectives work together to ensure that the government buys only the data and software rights that it needs and, therefore, pays the lowest possible price.

6. The transfer of technology to the marketplace is a normal part of commercial transactions. When a private entity purchases research services that lead to an invention or software, it may pay to obtain title and license the technology to others, or it may seek to lower its cost by taking only the rights it needs in the form of a license, and leaving the inventor or developer the right to commercialize intellectual property to other users. Either way, the party

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[9] *Intellectual Property: Navigating Through Commercial Waters*, pp. 2-9 & 2-13 (Oct. 15, 2001) (Exhibit EC-557).

[10] 48 CFR § 27.402(b) (Exhibit US-147).

[11] 48 CFR § 227.7103-1 (2006) (Exhibit US-1325).

[12] *Intellectual Property: Navigating Through Commercial Waters*, p. 1-3 (Oct. 15, 2001) (Exhibit EC-557).

paying for the work keeps some of the benefits for itself, and the invention or the data is transferred to the market.

7. U.S. government policy toward rights in technical data and computer software works in a similar way. The policy for all agencies, formalized in parallel with Executive Order 12591, states:

> (a) It is necessary for the departments and agencies, in order to carry out their missions and programs, to acquire or obtain access to many kinds of data produced during or used in the performance of their contracts. Agencies require such data to: obtain competition among suppliers; fulfill certain responsibilities for disseminating and publishing the results of their activities; ensure appropriate utilization of the results of research, development, and demonstration activities including the dissemination of technical information to foster subsequent technological developments; and meet other programmatic and statutory requirements. Further, for defense purposes, such data are also required by agencies to meet specialized acquisition needs and ensure logistics support.
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> (b) At the same time, the Government recognizes that its contractors may have a legitimate proprietary interest (e.g., a property right or other valid economic interest) in data resulting from private investment. Protection of such data from unauthorized use and disclosure is necessary in order to prevent the compromise of such property right or economic interest, avoid jeopardizing the contractor's commercial position, and preclude impairment of the Government's ability to obtain access to or use of such data. The protection of such data by the Government is also necessary to encourage qualified contractors to participate in Government programs and apply innovative concepts to such programs. In light of the above considerations, in applying these policies, agencies shall strike a balance between the Government's need and the contractor's legitimate proprietary interest.[13]

8. The DoD acquisition regulations expand on these concepts to state that "DoD policy is to acquire only the technical data, and the rights in that data, necessary to satisfy agency needs."[14] Technology transfer is the logical corrollary of this policy. Once the government obtains the rights it needs, the remaining rights transfer to the market.

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[13] 48 C.F.R. § 27.402 (Exhibit US-147).

[14] 48 C.F.R. § 227.7103-1 (Exhibit US-1325). 48 CFR § 227.7103-5(a)(2) and (a)(4) through (9) list specific circumstances in which the government obtains an unlimited license for data, even in the context of an overall government purpose license. These situations include form, fit, and function data; corrections to other unlimited rights data; materials produced as a deliverable under the contract; data necessary for installation, operation, maintenance, or training; and others.

9. The objective of these policies is to obtain for the government the best technology at the lowest possible acquisition cost. The very first "core principle" identified in the DoD intellectual property handbook is to "{i}ntegrate IP considerations fully into acquisition strategies for advanced technologies in order to protect core DoD interests" because "IP considerations have a critical impact on the cost and affordability of technology. . . ."[15] The handbook stresses that contract negotiators should "apply good business sense" when considering the balance of the needs of the Government and industry for intellectual property rights because "what good is done if highly restrictive data rights and patent clauses are used that may only discourage vitally needed technology firms from participating?"[16] As these quotations show, the commercial considerations of balancing government need against the market's willingness to supply that drive the intellectual property terms in government contracts.

320. Both parties have argued that "the terms of a commercial transaction in which one entity pays another entity to conduct R&D" should serve as a market benchmark against which the terms of any financial contributions provided to Boeing under NASA/DoD R&D programmes could be compared for the purpose of determining whether those financial contributions conferred a "benefit" within the meaning of Article 1.1(b) of the SCM Agreement (EC RPQ 21; US RPQ 136(a)). Do the parties consider that what constitutes an appropriate market benchmark for purposes of considering whether contractual provisions on intellectual property rights confer a benefit may depend upon factors such as the type of R&D (e.g. "basic" vs. "applied" research), the economic sector involved (e.g. civil aeronautics vs. medical research), and/or the circumstances of the parties to the transaction (e.g. a manufacturer vs. a university or other scientific research establishment)?

10. The evaluation of whether a benchmark is appropriate must begin with the objective of the exercise – to assess whether a financial contribution confers a benefit because its terms are "more favourable than those available to the recipient in the market."[17] Comparison with a benchmark also allows a panel to determine the extent of any benefit found, and through that, the magnitude of any subsidy.

11. Thus, a proposed benchmark must be sufficiently comparable to the financial contribution in question that it can demonstrate the terms available in the market for that transaction. Otherwise, an observed difference between the terms of the benchmark and the

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[15] *Intellectual Property: Navigating Through Commercial Waters*, p. 1-1 (Oct. 15, 2001) (Exhibit EC-557).

[16] *Intellectual Property: Navigating Through Commercial Waters*,, p. 3-3 (Oct. 15, 2001) (Exhibit EC-557); *see also ibid.*, p. 1-4 ("DoD policy is to require delivery of only the technical data and computer software necessary to satisfy agency needs" and "changes in commercial license terms should be negotiated only when there is a specific Government need that must be addressed and when the Government is willing to pay the cost associated with the particular Government need.").

[17] *Canada – Aircraft (AB)*, para. 157.

terms of the financial contribution might be the result of substantive differences between the transactions, and not valid evidence of the existence of a benefit.

12. For example, the *Korea – Shipbuilding* panel was willing to accept as a benchmark any loan, "{p}rovided it is negotiated on a commercial basis by a market operator, and is comparable in terms of duration etc."[18] On this basis, it rejected as benchmarks loans that were issued five years before the government loan.[19] It also refused to accept an uncollateralized loan as a benchmark for a collateralized loan, a guaranteed bond as a benchmark for an unguaranteed loan, a yen-denominated bond as a benchmark for a won-denominated loan, or a three-year bond as a benchmark for a six-month loan.[20] On the other hand, the Panel accepted benchmarks that were not absolutely identical to the government financial contributions, as long as it was possible and practical to make adjustments to account for any differences. For example, it found that although the proposed benchmark was based on unsecured bonds and the government loan was collateralized, the complaining party had properly adjusted the data and, therefore, "we consider that any rating discrepancy caused by differences in collateralization . . . is appropriately addressed."[21] The *Korea – Shipbuilding* panel also rejected as benchmarks loans offered by public bodies or government-owned entities out of concern that those loans' terms and rates were "based on public policy, rather than commercial, principles."[22]

13. The level of commercial advancement of the research (a continuum that moves from basic research to applied research to competitive development) and the economic sector (aeronautics vs. medical) are both obvious examples of considerations that would affect the comparability of a benchmark.

14. With regard to the stage of research, there may be a relevant distinction between transactions related to precompetitive activities like basic and applied research and competitive research, when it comes to developing a product or service for commercialization. Pre-competitive research generally presents less concern about acquiring rights to exclude competitors because it does not relate to any particular product. In the market for this type of research, it may make economic sense for a purchaser to secure a lower price by leaving some of the rights to the supplier, recognizing that the commercial potential is unknown. Competitive development research generally presents greater concern about the exclusion of potential

[18] *Korea – Shipbuilding*, para. 7.155.

[19] *Korea – Shipbuilding*, para. 7.185.

[20] *Korea – Shipbuilding*, paras. 7.175, 7.229, 7.237, and 7.243

[21] *Korea – Shipbuilding*, para. 7.262. The Appellate Body in *US – Cotton Subsidies (21.5) (AB)* reached a similar conclusion, allowing a comparison between two different loan programs because, "rather than 'forcing a comparison' despite the dissimilarities between the programmes, the Panel specifically addressed the dissimilarities by reviewing various adjustments made in the evidence submitted by Brazil to render the LCI and MTI more analogous to the GSM 102 programme, and considered them to be 'appropriate'." *US – Cotton Subsidies (21.5)(AB)*, para. 312, *quoting US – Cotton Subsidies (21.5)(Panel)*, para. 14.125.

[22] *Korea – Shipbuilding*, para. 7.172 (citations omitted); *see also Ibid.*, para. 7.179.

research because allowing the supplier to retain rights might harm the commercial prospects for the product being researched.

15. The economic sector to which the benchmark applies may also be a relevant indicator of its comparability. Obviously, a benchmark from the same sector would be the most relevant information available. Information related to a different sector would leave open the possibility that sector-specific considerations or practices, and not subsidization, caused the observed differences. Thus, benchmarks from different sectors may be entitled to less weight than same-sector benchmarks.

16. Finally, the United States notes that the appropriateness of a benchmark also depends on the assertion for which it is put forward as evidence. In this dispute, the EC assertion is that no commercial entity would ever purchase research services without demanding all intellectual property rights arising out of work done under the contract. Evidence suggesting that one company generally insists on obtaining all intellectual property rights, or that companies in one sector follow such a practice, provides little support for the sweeping proposition that all companies in all transactions always follow one practice with regard to those rights.[23] In fact, the benchmarks available to the panel demonstrate a range of "terms available to the recipient in the market." As long as the terms of the challenged government transaction fall within this spectrum, and absent evidence that other terms are non-commercial, there is no basis to conclude that they confer a benefit.

17. By contrast, whether the purchaser or seller of research services is a manufacturer, university, or other research company would not by itself affect the appropriateness of a transaction as a benchmark as long as the entity negotiated the terms of the proposed benchmark transaction at arm's length in the market. For example, universities and other not-for-profit institutions routinely buy goods and services from outside suppliers. The fact that one party to a transaction is a not-for-profit entity does not prevent the transactions from being commercial in nature. Similarly, where for-profit entities negotiate at arm's length with universities to purchase research services for commercial purposes, the terms of the transaction could reflect commercial

[23] The EC states that "{t}he entity performing the R&D would not be allowed to keep and utilize the technology for itself without negotiating some form of compensation in return." EC RPQ 21, para. 76. However, there is compensation for the division of the intellectual property rights under U.S. government contracts. As DoD's negotiating handbook points out, the "compensation" might be a lower price for the agency ("IP considerations have a critical impact on the cost and affordability of technology"). *Intellectual Property: Navigating Through Commercial Waters*, p. 1-1 (Oct. 15, 2001) (Exhibit EC-557). There is also the compensation to the government of actually getting technology that would be unavailable to it if it insisted on 100 percent of all intellectual property rights. As DoD's handbook explains, "what good is done if highly restrictive data rights and patent clauses are used that may only discourage vitally needed technology firms from participating? Competition would be reduced and the key technology leaders in a particular field may not participate." *Intellectual Property: Navigating Through Commercial Waters*, p. 3-3 (Oct. 15, 2001) (Exhibit EC-557). Of course, vigorous competition is one factor that helps to secure the best value for the government given what it needs to acquire. US SNCOS, paras. 17-20.

considerations and market forces.[24] Therefore, universities and other not-for-profit institutions could provide an appropriate benchmark.

321. Is the Panel correct in its understanding that some of the DoD RDT&E project elements at issue were funded through cooperative agreements or other "assistance" instruments, whereas others were funded through procurement contracts? If so, please clarify which project elements were funded through cooperative agreements or other "assistance" instruments, and which project elements were funded through procurement contracts.

18. The Panel's understanding is only partially correct. To begin, the question reverses the relationship of program elements to contracts, cooperative agreements, and other assistance instruments. The "program elements" in DoD's budget represent pools of money that DoD may draw upon to pay for its expenses – procurement of supplies, paying employee salaries, procurement of services, etc. Thus, a program element funds contracts, cooperative agreements, grants or other activities of one or more authorities within DoD.

19. One of the functions of program elements is to segregate funds within the overall amount of money budgeted for DoD in a particular year, and to specify particular ways in which they may be used. For example, under program element 0603112F, covering advanced materials for weapons systems, the 2006 budget states:

> This program develops and demonstrates materials technology for transition into Air Force systems. The program has four projects which develop: (1) hardened materials technologies for the protection of aircrews and sensors; (2) non-destructive inspection and evaluation technologies; (3) transition data on structural and non-structural materials for aerospace applications; and (4) airbase operations technologies including deployable base infrastructure, force protection, and fire fighting capabilities.[25]

A DoD office seeking to conduct one of these activities can draw upon funds available under this program element to buy supplies, pay employees, or fund procurement of research services to assist in achieving these goals.

20. Program elements do not typically specify a particular type of instrument that DoD must use for funding work conducted by non-DoD entities. Instead, a DoD office seeking to draw on

[24] This is the case because if the university offered a price and package of intellectual property rights less advantageous than a private supplier of research services, the purchaser would choose the private supplier instead. The availability of a commercial alternative, therefore, disciplines what the university can ask and informs what the private purchaser will accept. This conclusion might differ if a particular university were a dominant market participant, but that is not the case in the aeronautics research sector.

[25] Advanced Materials for Weapons Systems Budgets for FY 1993-FY 2007 (PE# 0603112F) (Exhibit EC-425, p. 158/188).

one or more program elements to fund a project chooses the funding instrument appropriate to the transaction based on the considerations described in US RPQ 192, paras. 235-238.

21. Thus, program elements typically do not, by their terms, provide funding through one type of instrument. (None of the 23 PEs challenged by the EC make such specifications.) However, in some cases, the objectives funded under a program element might result in a tendency to fund assistance instruments more frequently than procurement instruments. For example, program element 0601102F covered "defense research science," and focused on "broad-based scientific and engineering" basic research.[26] As the United States explained in its first written submission, this topic resulted in the award of more than 90 percent of the funding under the program element to universities, research institutions, and government organizations.[27] Since grants are rarely appropriate for commercial businesses, and more appropriate for universities, the group of instruments funded under this program element would tend to have a higher proportion of grants than a group of instruments funded under other program elements.

22. In another example, program element 0602805F, covering dual-use science and technology, did not specifically require one type of funding instrument. However, it aimed at "cooperative funding" by industry and government.[28] Thus, instruments funded under this program element would tend to provide for cost sharing through cooperative agreements, cost-sharing contracts, or other transaction agreements.[29] Similarly, program element 0708011F, covering industrial preparedness and manufacturing technology, focused on funding "advancements in manufacturing process technologies, manufacturing engineering systems, and industrial practices."[30] This objective led in some cases to use of funds for projects in which DoD could obtain industry contribution through cooperative agreements or "other transactions" under the authority of 10 U.S.C. § 2371.[31] However, the program element did not prohibit the funding of procurement contracts, and some funds did go to procurement contracts because those were the appropriate instruments in light of the nature of the transaction.[32]

23. Therefore, it is not possible to conclude that a given program element funds exclusively assistance agreements or exclusively procurement contracts.

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[26] Defense Research Sciences (PE# 0601102F) Budgets (Exhibit EC-419, pp. 3/587, 26/587, and 47/587).

[27] US FWS, para. 150, note 198.

[28] Dual Use Science and Technology (PE#0602805F) Budgets (Exhibit EC-424, pp. 19/49, 26/49, 32-33/49, 39-40/49, and 45-46/49).

[29] US RPQ 192, paras. 237-238.

[30] Air Force Industrial Preparedness/Manufacturing Technology Budges (PE #0708011F for FY 1993, FY 1997-FY 2007; PE# 0603771F for FY 1996) (Exhibit EC-432, p. 56/128).

[31] US RPQ 20 discusses these transactions in more detail.

[32] DoD Contracts with Funding from Multiple PEs, pp. 2-3 (Exhibit US-1267) (Contract F33615-91-C-5716, for Design and Manufacture of Low Cost Composites, Fuselage, and Contract F33615-93-C-4302, for Manufacturing Technology for Welded Titanium Aircraft Structures).

322. Please explain whether "a government provides goods or services other than general infrastructure" within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement when the government provides access to results of research performed by a government agency or when it provides access to results of research funded by the government and performed by non-governmental entities, and, if so, how the existence of a benefit within the meaning of Article 1.1(b) of the SCM Agreement should be determined.

24. This question is one whose resolution is not necessary to an assessment of the EC's claims and arguments. The EC has assured the Panel that:

> {T}he European Communities' claim is that NASA provides "goods and services" to Boeing in the form of "facilities, equipment, and employees" through the eight NASA aeronautics R&D programmed at issue.[33]

The EC made the same point in its second written submission:

> {T}he European Communities has not challenged the entirety of NASA's provision of goods and services…. The European Communities' challenge focuses on NASA's provision of facilities, equipment, and employees … to Boeing's LCA division.[34]

When the U.S. government allows "access" to the results of its research by allowing the public to buy a hard-copy document or download an electronic copy via the Internet, it could be conceived as providing a good or supplying a service. However, that "access" does not provide "facilities", "equipment", or "employees" to Boeing in the manner covered by the arguments put forward by the EC.

25. The EC does challenge Boeing's "access" to NASA resources subject to an SAA, making NASA-owned equipment available for use in fulfilling a NASA contract, or NASA employees' administration and oversight of government contracts. The United States has explained that when NASA provides goods and services under a non-reimbursable or partially reimbursable SAA, the private party's contribution affords adequate remuneration within the meaning of Art. 1.1(a)(1)(iii).[35] When NASA makes items available to a contractor to further the work under a contract, they are not "provided" to the contractor within the meaning of Art. 1.1(a)(1)(iii) because they are made available solely for the purpose of carrying out the work identified in the

[33] See EC RPQ 168, para. 279.

[34] EC SWS, para 385-386.

[35] See US FWS, paras. 230-261. When NASA employees perform joint research with contractors under SAAs, the estimated value of their effort forms part of the NASA contribution for which Boeing provides adequate remuneration.

contract.[36] They are, in effect, provided by NASA to itself. Similarly, any government employees involved in the process are there to advance NASA's goals by monitoring the contractor's compliance with the terms of the contract, or taking the contractor's contribution to advance further work by NASA.[37] Moreover, the United States has demonstrated that equipment or facilities made available under contracts confer no benefit.[38]

26. Nevertheless, if the Panel finds that these NASA actions do confer financial contributions within the meaning of Art. 1.1(a), the U.S. response to Question 352 provides a method to determine the magnitude of any benefit. The Panel should note that, in light of the EC's concession that its arguments do not extend to all goods and services in the NASA budget, its proposal to treat the entire NASA budget as goods and services provided to U.S. producers of civil aircraft, engines, and parts is invalid.

27. The remainder of the U.S. response to this question is a contingent rebuttal, for use if the Panel considers that the EC's arguments reach to access to the results of research in addition to facilities, equipment, and employees. Even though such access may be a good or service, it is not a financial contribution because the provision of NASA reports and other results of its research is general infrastructure and, therefore, not a financial contribution.

28. As the United States has previously discussed, infrastructure is "general" when there are no *de jure* or *de facto* limitations on its use.[39] The unlimited accessibility of the results of

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[36] See US FWS, para 231, n. 333; US SNCOS, para. 55; and US Comments on EC RPQ 169, para. 277. The Federal Acquisition Regulations contain regulations and contract clauses to protect government rights:

> **Policy.** (a) Contractors are ordinarily required to furnish all property necessary to perform Government contracts.
>
> (b) Contracting officers shall provide property to contractors only when it is clearly demonstrated – (1) To be in the Government's best interest; (2) That the overall benefit to the acquisition significantly outweighs the increased cost of administration, including ultimate property disposal; (3) That providing the property does not substantially increase the Government's assumption of risk; and (4) That Government requirements cannot otherwise be met.

48 CFR § 45.102 (Exhibit US-1327). The government property contract clause for cost reimbursement contracts states:

> (1) The Government shall retain title to all Government-furnished property. . . .
>
> (4) . . . Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall Government property become a fixture or lose its identity as personal property by being attached to any real property.

48 CFR § 52.245-5(c)(1) & (4) (Exhibit US-1328).

[37] US FWS, para. 266

[38] US SNCOS, paras. 28-31; US RPQ 186, para. 207; US RPQ 212, para. 337, US Comment on EC RPQ 148(e), para. 169; US Comment on EC RPQ 171, para, 275.

[39] US RPQ 35 and US RPQ 128.

NASA-funded research through its library of technical reports, data, scholarly reports, and other information demonstrates that they constitute general infrastructure. Specifically, NASA makes the results of research performed or funded by the agency available to all users throughout the United States and the world – including Airbus – in hard copy, electronic publications, and conference presentations.[40]

29. The centrality of these efforts to NASA's mission can be seen in the decision by the U.S. Congress, when it recently imposed a spending cap on NASA, to exempt from the cap expenditures on the scientific and technical conferences or education-related conferences. The Congress did this in recognition of the requirement under the Space Act that "NASA provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."[41] The NASA Acting Administrator thanked the scientific community for advocating this exemption, stating

> I appreciate your efforts and the awareness reinforced through this issue about the importance of NASA's continued role in disseminating and exchanging scientific and technical information. I look forward to continuing to work with you and associations like AIAA to further the widest possible exchange and dissemination of scientific and technical information.[42]

In sum, to the extent that members of the public, scientists, and enterprises in all sectors have access to the results of NASA's research, they simply make use of general infrastructure.

30. Second, if the Panel concludes that access to the results of NASA research is a provision of goods and services within the meaning of Art. 1.1(a)(1)(iii), it must evaluate whether NASA receives less than adequate remuneration for research it makes generally available.[43] It does not. NASA charges little for access to its materials – a modest sum for hard copy or microfilm/CD ROM versions of NASA reports, and nothing for documents downloaded via NASA's publicly accessible website, published in peer-review journals, or presented at scientific and technical conferences.[44] The most comparable market transaction would be the general publication of

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[40] US SWS, para. 64 (regarding paper presented at conferences and made available through the NASA Technical Reports Server). *See also* US SNCOS, para. 34, *citing* Exhibit EC-1175 (Airbus engineers admit that these same reports have "generic and academic value to Airbus.").

[41] See National Aeronautics and Space Administration Authorization Act of 2008, P.L No. 110-422, Section 1121 (Exhibit US-1329) and Explanatory Statement Submitted by Mr. Obey, Chairman of the House Committee on Appropriations, Regarding H.R. 1105, Omnibus Appropriations Act, 2009 (Feb. 23, 2009) (Exhibit US-1330). See also Space Act, Sec. 203(a)(3)(Exhibit EC-286).

[42] Letter from Christopher J. Scolese, Acting NASA Administrator to George K. Muellner, President American Institute of Aeronautics and Astronautics (April 28, 2009)(Exhibit US-1331).

[43] The U.S. response to Question 320 addresses benchmark selection in greater detail.

[44] US FWS, para 209. As one would expect, individuals in academia or industry with a certain interests and expertise (*e.g.*, aerodynamics, propulsion, high-tech materials) are in the best position to take full advantage of the materials in NASA's library. These individuals are not found only in the aerospace sector. The evidence

papers in scholarly journals or presentation of papers at conferences. Peer-review journals and technical conferences charge only slightly more, but they also add value by prescreening work. Even so, the prices are not high. For example, the 2009 price of non-student admission to the primary annual conference sponsored by the American Institute of Aeronautics and Astronautics – at which governmental and non-governmental entities present papers – ranges from $600 to $900, depending on how many side events the participant wants to attend. That price includes a large volume of program materials, including presented papers, and a luncheon.[45] The annual price of subscriptions to the major peer reviewed journals in aerospace-related fields, in which governmental and non-governmental researchers publish papers, range from under $100 to $5000.[46] In sum, any difference between the prices charged by NASA and those in the marketplace is negligible, especially in the context of the revenue from sales of large civil aircraft.

323. At paragraph 11 of its Closing Statement at the Second Meeting, the European Communities indicated that "{i}f the Panel desires to see further examples of the treatment of IP when one for-profit entity purchases R&D services from another for-profit entity, the European Communities is prepared to provide them upon request." The Panel hereby requests that the European Communities provide these further examples.

31. The United States offers the following examples of the treatment of patent rights when one for-profit entity purchases research services from another for-profit entity. In both instances, the purchaser's payment for the cost of the research services does not entitle it to the patent on any inventions made in the course of performing those services. In one of the contracts, however, the purchaser agrees to pay an additional fee in order to obtain such patent rights.

(1) Contract E (Exhibit US-1342(BCI)) memorializes an agreement with a for-profit entity. Under the terms of this contract, Boeing agrees to pay the cost of performing specified research services. In exchange, it receives the results of the research and a non-exclusive, paid-up license to use project intellectual property

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demonstrates that designers and engineers in fields as diverse as maritime, automotive, energy and swimwear use NASA research. See US FWS, paras. 208-210. The determination regarding the generality of infrastructure is, however, based on ability to *access*. The particular use that experts make of NASA's research results does not preclude ability other people or entities from access, just as a national park hiking trail does not become any less general infrastructure because only a few people have the strength to traverse it.

[45] *E.g.*, 47th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition (Exhibit US-1332) ("The {2009} Aerospace Sciences Meeting will feature a major multidisciplinary forum for aerospace scientists and engineers from around the world, including corporate, government and academic participants, to exchange scientific knowledge and research results with a view towards new technology for aerospace systems. The new, expanded meeting space will allow additional technical paper sessions to be added to this conference.")

[46] A list of the current subscription prices of a range of major aerospace journals to which Boeing subscribes is provided at Exhibit US-1333.

for the purpose of Boeing products, but must pay extra for any additional licenses.[47]

(2) Contract F (Exhibit US-1343(BCI)) memorializes an agreement with a for-profit entity. Under the terms of this contract, Boeing agrees to pay the cost of performing specified research services; in exchange for that base payment, it receives only the requested research services, without any provision of intellectual property rights in the results. To the extent that Boeing wishes to acquire rights in the intellectual property developed in the course of the project, it must make additional payments to the provider of the research services.[48]

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326. Is the United States arguing that some or all of the NASA R&D programmes at issue (and/or DoD RDT&E project elements at issue) involved "fundamental research" as that term is defined in footnote 26 to Article 8.2(a) of the SCM Agreement?

32. The United States has not sought to characterize NASA or DoD programs as "fundamental" within the meaning of footnote 26 to Article 8.2(a) of the SCM Agreement because that Article no longer applies, by operation of Article 31 of the SCM Agreement. However, it is clear that much of NASA's research meets the footnote 26 definition of "fundamental research as "an enlargement of general scientific and technical knowledge not linked to industrial or commercial objectives." DoD's research, however, would not meet that definition.

33. In considering NASA research, the relevant fact is that *all* of its research under the challenged programs was "foundational," in that it was not directed at the development of a particular commercial product, and was disseminated to the broader scientific community throughout the world. The United States has put forward this information in support of several points. First, the foundational nature of NASA's research explains why the United States purchased research services from Boeing – to advance NASA's statutory objective of "the expansion of human knowledge of the Earth and of phenomena in the atmosphere and space."[49] Second, the nature of the research explains why the NASA programs do not cause adverse effects – because they do not advance the development of particular aircraft, and because Airbus

[47] Contract E, p. 1 (Exhibit US-1342(BCI)) (Article 2: "Project Intellectual Property (PIP) means, Intellectual Property solely or jointly created, or first actually reduced to practice, in the course of carrying out a Research Project") and p. 9 (Article. 8.5: "{Company} agrees to and hereby grants to Boeing, and to Affiliates, subcontractors, suppliers of subcontractors at any tier and customers of Boeing, an irrevocable, nonexclusive, royalty-free, paid up worldwide license to practice and have practiced all {Company Project Intellectual Property} to make, have made, use, and sell Boeing products.").

[48] Contract F, p. 2 (Exhibit US-1343 (BCI)) (Art. 4, providing separate fee schedules for acquisition of services and IP rights).

[49] Space Act, § 102(d)(1) (Exhibit EC-286); US FWS, paras. 186-194; US FNCOS, paras. 56-65; US SWS, paras. 64 and 67-69; US SNCOS, paras. 49-52.

and its suppliers can also build – and have already built – on the knowledge foundation laid by NASA.[50]

34. For example, NASA described the R&T Base Program as:

> an essential element of the Enterprise, for it is here that new technologies that lead to future advanced aerospace products are conceived. Providing a strong foundation for the fundamental understanding of a broad range of physical phenomena, development of computational methods to analyze and predict physical phenomena, and experimental validation of key analytical capabilities. The R&T Base also develops revolutionary concepts, highly advanced, accurate computational tools and breakthrough technologies that can reduce the development time and risk of advanced aerospace systems and high performance aircraft. A significant portion of the research and concept development in the R&T Base is performed through partnerships and cooperative agreements with the aerospace industry and other government agencies to facilitate rapid technology transfer. Also, the R&T Base supports the vast majority of the Enterprise's peer-reviewed fundamental research with academia and industry. The program also provides the capability for NASA to respond quickly and effectively to critical problems identified by other agencies, industry or the public. Examples of these challenges are found in: aircraft accident investigations, lightning effects on avionics, flight safety and security, wind shear, crew fatigue, structural fatigue, and aircraft stall/spin.[51]

As this quotation shows, much of the work under the R&T Base program – the highest value research program according to the EC's calculation[52] – did not aim at particular products. In fact, it provided funding for the most basic research, including peer reviewed research published in technical journals. It also addressed public safety problems common to all types of air transportation. Such research would fall into the category of fundamental research.

35. DoD R&D activities generally had a different nature. Even when DoD funded early-stage research (in its terminology, "basic research") it did so with an eye to new weapons systems, and without the objective of broad dissemination. For example, the Defense Research Sciences program element, labeled "basic" research for DoD's purposes, funded research in

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[50] US FWS, paras. 205-210 & 220-223; US SWS, paras. 67-69; US RPQ 23, paras. 73-78; SNCOS 35-36. At the Panel's second substantive meeting with the parties, the United States submitted an advertisement by Brazilian airline TAM, which flies only Airbus, bragging "Nossos aviões têm a mesma tecnologia da NASA." (In English, that means "Our airplanes have the same technology as NASA.") (Exhibit US-1261).

[51] US RPQ 163(g), para. 248, *citing* NASA R&T Base Budget Estimates, FY 1999, p. SAT 4.1-2 (Exhibit EC-398).

[52] Exhibit EC-25, p. 4.

technologies "critical to Air Force weapons systems."[53] Thus, DoD research could not be properly characterized as "fundamental" for purposes of Article 8.

327. Does the United States contest that when NASA provides to the US civil aircraft industry access to results of research performed by NASA itself or to results of research funded by NASA and performed by entities outside the US civil aircraft industry NASA thereby provides "goods or services" within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement to the US civil aircraft industry?

36. As the United States noted in its response to Question 322, the EC has not challenged the provision of "access to results of research" funded by NASA. Even if NASA's sending of a hard copy report or scholarly paper to a requester, or making an electronic copy of such a document available for download were considered as providing a good or supplying a service in the libraries, archives, museums and other cultural services sector, such goods and services are general infrastructure because NASA makes them available without *de facto* or *de jure* restrictions on use.[54]

37. The Panel should also note that NASA also provides the results of research performed by NASA itself and the results of research funded by NASA and performed by the U.S. civil aircraft industry to entities *outside* the civil aircraft industry. Indeed, as is demonstrated by the easy access Airbus engineers and EC lawyers had to agency materials, NASA routinely provides its research results – including those supplied by Boeing – to entities outside the United States.

328. How does the United States respond to the argument of the European Communities (EC Comments on US RPQ 214, paras. 269-272) that the argument of the United States regarding the distinction between cooperative agreements under the ATP, on the one hand, and cooperative agreements under the NASA and DOD R&D programmes, on the other, is not persuasive?

38. The EC arguments do not in any way address the substance of the U.S. response to Question 214, which demonstrated that NASA and DoD cooperative agreements explicitly aim to develop technologies useful to the U.S. government's performance of its public safety function. For example, the work done under the NASA cooperative agreements covered by the EC claims developed aviation safety technologies for use by airports and airlines.[55] The work

[53] *E.g.*, Defense Research Sciences Budgets for FY 1993-FY 2007 (PE #0601102F), (Exhibit EC-419, pp. 3-4, 26, 27, 69, 109, 137, 167, 211, 252, 295, 342, 391, 438, and 487).

[54] The U.S. response to Question 322 discusses this issue in greater detail.

[55] Only three cooperative agreements were funded through the programs identified by the EC. Two of them have been submitted to the Panel. NCC-1-343 was signed with Jeppesen-Sanderson, Inc., to integrate terrain, obstacle, and airport databases for two airports in the United States and one in South America to study the use of synthetic vision mechanisms for flights into and out of those airports. Cooperative Agreement NCC-1-343, pp. 23-24 (Exhibit US-597). Such a database would obviously improve aviation safety – a function performed by the U.S. Federal Aviation Agency – by allowing aircraft to use synthetic vision when weather conditions impede visibility.

done under DoD cooperative agreements studied technologies related to DoD's national defense function.[56] In clear contrast, ATP carries out its mission of accelerating the development and dissemination of high-risk technologies with the potential for broad-based economic benefit through use of cooperative agreements that assist domestic and foreign companies established in the United States in developing "high-risk fledgling technologies" that could lead to positive spillovers for other companies and industries.[57] For example, ATP funded research projects that improved technology for color television screens, used the Internet for supply chain coordination, and developed a corn-derived dextrose polymer developed for biodegradable packing and clothing fibers.[58] These technologies may have advanced the commercial objectives of program participants, but had no use to the U.S. government in carrying out its governmental responsibilities.

39. The EC never addresses this evidence. Instead, it restates old superficial arguments with no evidentiary support. It begins by asserting that ATP's "purpose" of "assisting U.S. companies with technology research" is "not fundamentally different" from NASA's "purpose" of "preservation of the United States preeminent position in aeronautics and space through research and technology development to associated manufacturing processes."[59] This assertion fails on every level. To begin with, the ostensible "purpose" of the overarching program is irrelevant to the Panel's question and the U.S. response, both of which addressed the substance of the transactions at issue.[60] The United States had shown that the NASA *transactions* serve the purpose of developing technologies useful to the government, namely, maintaining a safe airspace. In sharp contrast, the ATP transactions advanced broad-based U.S. national economic benefit, in part through particular companies' commercial interests. Second, the EC attempts to equate NASA with ATP based on NASA's supposed "purpose," ignoring, as always, that NASA's "purpose" goes far beyond the "preservation of preeminence" objective expressed in section 102(d)(9) of the Space Act. The NASA cooperative agreements clearly served the agency's other interests, including "the expansion of human knowledge," "cooperation . . . with

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There was also no objective of helping Boeing, as contractor Jeppesen-Sanderson was independent at the time of the contract, and only later purchased by Boeing. In addition, two of the "airline partners" in the project – Luftahansa and American Airlines – fly both Airbus and Boeing aircraft. *Ibid.*, p. 25. Cooperative agreement NCC 1-287 was for research to develop an Aviation Weather Information System "to improve weather information technology to allow better and more timely decisions by pilots and thereby decrease the probability of weather-related incidents." NCC-1-287 Memorandum, Part A, chapeau (Exhibit US-588, p. 4/11). The decision to use a cooperative agreement was specifically based on the conclusion that "the proposed aviation weather system is for a public purpose (national goal of reducing fatal airplane accidents)." *Ibid.*, part B, p. 5/11. Disbursements under the third NASA cooperative agreement with Boeing represented less that 0.5 percent of the value of the other two.

[56] *See, e.g.*, US FWS, paras. 93, 102, and 162-164.

[57] US RPQ 214, para. 343, *quoting* NIST, Measuring ATP Impact: 2006 Report on Economic Progress, p. 2 (March 2007) (Exhibit US-149).

[58] *Measuring ATP Impact: 2006 Report on Economic Progress*, pp. 29 & 32 (Exhibit US-149)

[59] EC Comment on US RPQ 214, para. 270.

[60] US RPQ 214, para. 342.

other nations and groups of nations" and especially "the improvement of the . . . safety of aeronautical and space vehicles."[61] It is this last statutory objective that clearly is far more relevant to the cooperative agreements at issue than the one cited by the EC, and clearly distinguishes the challenged NASA programs from ATP.

40. The EC moves on to repeat its allegation that under NASA's programs "there is no genuine purchase of services, and no adequate remuneration."[62] The United States has shown at length that this is untrue.[63] In any event, it is also irrelevant, as the point the EC attempts (incorrectly) to make does nothing to rebut the observation that research under the NASA cooperative agreements was related to a government service performed by the agency, while the ATP cooperative agreements are related to proposals with commercial objectives identified by the recipients. This observation would remain true even if the EC were able to establish that the purchase was not "genuine" or the remuneration not "adequate."

41. In a similar vein, the EC repeats its assertion that DoD does not provide anything in exchange for the "portion" of DoD RDT&E funding that supposedly benefits Boeing's large civil aircraft division. This assertion is equally wrong and equally irrelevant, as it does not address the substance of the DoD cooperative agreements, or the fact that the research relates to DoD's activities in providing the governmental service of national defense.

42. Finally, the EC repeats its assertion that the transactions at issue do not represent purchases of services.[64] This assertion is again wrong[65] and irrelevant to the U.S. observation that the substance of the ATP cooperative agreements was different from the substance of the NASA and DoD cooperative agreements.

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334. Please explain what the United States means when it says in its First Written Submission, footnote 277, that NASA's records show that the total programme budget challenged by the European Communities is $10.9 billion in "as budgeted" terms in the year of execution, rather than the $12.4 billion alleged by the European Communities.

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[61] Space Act, § 102(d)(1), (2), (7), and (9) (Exhibit EC-268).

[62] EC Comments on US RPQ 214, para. 271.

[63] US FWS, paras. 213-217; US SWS, paras. 62-64; US RPQ 20, paras. 45-47, 51-59; Exhibit US-1207; US SNCOS, paras 33-34 and 45-52.

[64] EC Comments on US RPQ 214, para. 272. The EC also claims that the U.S. has "retracted" its view that the type of instrument is relevant to a determination as to whether a transaction is a purchase of services. This is incorrect. The Panel's question asked the United States how to differentiate between ATP cooperative agreements on the one hand and NASA and DoD cooperative agreements on the other. The type of instrument is obviously irrelevant to this particular question. However, the fact that *other* transactions occur through procurement contracts remains relevant to an evaluation of those transactions.

[65] US FWS, paras. 90-98 and 213-217; US FNCOS, paras. 45-48 and 63-65; US SWS, paras. 31-35 and 62-64; US SNCOS, paras. 10-13 and 48-51.

Specifically, please explain how amounts set forth in the "NASA appropriated budgets" (US RPQ 182, para. 188) differ from the Budget Estimates used by the European Communities to arrive at its estimate of $12.4 billion for the total programme budgets and what the United States means by ""as budgeted" terms in the year of execution".

43. The EC valued the amount that NASA spent based on the agency's annual budget estimates. In those documents, NASA also reports "actual" figures for previous years. The EC based its funding allegation for each year on the "actual" amounts reported in budget estimates one year afterward. For example, the EC valued VSP spending for 2005 based on the "actual" amount reported in the NASA 2007 budget estimate.

44. The figures in NASA's budget estimates show the amount of funds appropriated under a program as of the date of the estimate. They do not show the amount of funds actually obligated over the life of the program, or any amounts deobligated. To give the Panel the most accurate data on what NASA actually did, the table in US FWS, para. 212 reports the amount obligated to each program as of the date NASA gathered data for the first written submission. Therefore, it presents a more accurate view of what NASA actually budgeted to the programs. The prior years' "actual" figures reported in NASA's budget estimates represent initial decisions as to funding and immediate adjustments. They do not, however, reflect actual disbursements (or obligations or deobligations) because NASA may find over the course of carrying out a program that it does not need all the funds obligated[66] to that program. As the response to Question 336(iii) explains, if that happens, NASA "de-obligates" the funds. This explains some of the differences.

45. The following table presents a comparison of NASA's budget data as presented in with the figures generated by the EC based on published budget estimates:

[66] The introduction to the U.S. response to question 336 and the response to Question 336(i) explain that budgeted amounts represent funds that Congress has authorized NASA to spend. The agency must then "obligate" those funds to particular cost objectives, such as contracts, or internal expenses.

Comparison of NASA Program Budget values as reported by NASA and as estimated by the EC (in $ 1 million)

Program	NASA records	EC estimate	Difference	Source for EC figure
ACEE	130	130	0	EC-25, p. 8
ACT & ACT composites	258	300	42	EC-25, p. 9
HSR	1,583	1,583	0	EC-25, p. 10
AST	715	810	95	EC-25, p. 11
HPCC	348	585	237	EC-25, p. 12
Aviation Safety	829	844	15	EC-25, p. 15
QAT	230	223	-7	EC-25, p. 16
VSP	1,329	2,002	673	EC-25, p. 17
R&T Base	5,525	5,888	363	EC-25, p. 19
Total	10,947	12,365		

46. Some of the variation in the parties' assessments of relevant overall NASA program budgets is due to the process described above. Another source of variation lies in the differences in the parties' approaches to determining the program budgets. In response to the Panel's request, NASA sought to understand these differences by making comparable budget formulation assumptions and comparing NASA and EC calculations. By NASA's estimation, based on available data from EC exhibits, the EC figures appear to erroneously include several elements that improperly inflated their estimates. For example, the EC incorrectly added the Fundamental Aeronautics Program FY2006 budget to the VSP program budget total to compensate for the elimination of the VSP program in FY2006.[67] In its HPCC budget formulation the EC included all NASA agency funding for HPCC, while the US HPCC budget contained only the Aeronautics funding for HPCC. The EC did not reduce its AST Program budget even though its ACT budget purportedly included AST Composites. The EC used the contract value of two composites contracts as the contribution of AST Composites to its ACT budget. The EC included security in its Safety Program budget; the United States did not. Correcting for these errors accounted for the vast majority, $1 billion, of the difference between U.S. and EC estimates.

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336. Please explain the differences between the following concepts, the source of information on amounts pertaining to each, and which most closely approximates the amount of payments made to Boeing under the research contracts with NASA: (i) amounts "obligated" under the awards as reported in the FPDS/FPDS-NG, as described in US

[67] Exhibit EC-25, p. 17, note 1.

RPQ 7, para. 12; (ii) funding that NASA allots to contracts as indicated in the contracts and modifications, as described in US RPQ 6, para. 3 and footnote 7; (iii) "payments" and "disbursements" in para. 212 and footnote 303 of the US First Written Submission and Exhibit US-1202; (iv) the "total award value" indicated in the performance evaluations submitted to the Panel;[68] *(v) the terms "value" and "maximum value" of contracts and awards as used in Exhibit US-1305 and paras. 158-159, 200, 217-218, 221-222, 224-225 of the US responses to the second set of Panel questions; and (vi) the "maximum extent" of a financial contribution (US Comments on EC RPQ 170(b), para. 294). Without limiting the generality of the foregoing:*

47. The United States will address each of the sub-parts of this question individually. But first, it is useful to consider some basic definitions:

- The **amount awarded** refers to the amount that NASA promises to pay if the contractor completes the work stated in a contract. If NASA revises the work in a way that affects the contractor's cost, it may also modify the amount awarded. Changes in awarded amounts are recorded in a contract modification.

- The amount **allotted** or **obligated** to the contract is the amount of funds from NASA's budget that it has set aside to pay for work performed under a contract.[69] The terms are synonymous. Once funds are obligated, NASA may use them only to pay for that contract.[70] The agency usually obligates only enough funds to cover payments expected in the near term. Increases in the amount obligated are recorded in modifications to the contract.

- **Payments** or **disbursements** are funds that NASA actually pays to its contractors when they present an invoice work completed under a contract. NASA may only pay out of obligated funds, so it periodically must replenish obligations. Since obligation of funds takes place in advance of payment, based on the expected amount of invoices, it is normal and required by law for a contract to have slightly more funding obligated to it than has been disbursed to the contractor.

48. Contract NAS1-20341 provides a good example of how these processes work. When NASA signed the contract on June 7, 1996, the total expected cost of the work (the amount

[68] *E.g.*, Exhibits US-479, US-480, US-486, and US-491.

[69] The term "obligated" reflects the fact that NASA may use those funds only for a contract to which they are allotted.

[70] NASA may reduce the amount obligated to a contract, but such "deobligations" require additional paperwork, as well as a contract modification. Depending on what fiscal year the deobligated funds are tied to, it may be possible to use them on other contract actions. In many cases, however, because of the length of time since the funds were initially made available to NASA via an appropriation from Congress, they may no longer be used by the agency.

awarded) was $10,115,000.[71] The amount obligated at the time of the contract was $60,000.[72] NASA obligated an additional sum to the contract on June 13, 1996.[73] Subsequent modifications reflect the obligation of additional funds in August, 1996, July 1997, August 1997, etc.[74] Finally, the last funding modification on June 11, 2002, brought total obligations to a sizable amount, but still less than the award value.[75] Throughout this process, NASA was disbursing obligated funds to Boeing, until eventually it paid out the amount indicated in Exhibit EC-1305, $8,442,567. This total differs from the last amount obligated by less than three percent.[76]

(i) amounts "obligated" under the awards as reported in the FPDS/FPDS-NG, as described in US RPQ 7, para. 12

49. The U.S. response to Question 7 addressed the derivation of the $715 million dollar estimated value of NASA contracts with Boeing provided in paragraph 212 of the U.S. first written submission. NASA obtained data on the amounts disbursed for each contract awarded from the NASA Procurement Management System ("NPMS"), and SAP/BW. NPMS was a NASA-specific system that captured a wide variety of data about NASA contracts, cooperative agreements, and grants, including both the amounts obligated and amounts disbursed (see item (iii) below) under contracts. SAP/BW is a financial management system that takes its data from all financial transactions that are processed through the NASA financial accounting system. The NPMS fed obligations and other data into the FPDS. (NASA employees manually input data into the NPMS.) When NASA transitioned to the new government-wide system (FPDS-NG), the data stream changed. Under FPDS-NG, obligations and other data are entered directly into the system by the contracting personnel in the field as they finalize their specific contracting actions. The data in FPDS and FPDS-NG will also reflect any corrections that may have been made. For a contract that has been closed out, the "obligations" amount will have been adjusted to match the amount disbursed over the life of the contract. Any excess funds will have been deobligated, and returned the Treasury.[77]

50. The incremental process of obligating money to contracts means that, while the amount obligated is always greater than or equal to the amount disbursed, the two are rarely very far apart. Once the contract has closed out, they are the same.

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[71] Contract NAS1-29341, p. 1 (Exhibit US-558).

[72] Contract NAS1-29341, p. 2, section B.3 (Exhibit US-558).

[73] Contract NAS1-29341, Modification 1, p. 2 (Exhibit US-559, p. 143/143).

[74] Contract NAS 1-29341, Modifications 2, 3, and 4 (Exhibit US-559, pp. 137, 139, 141/143).

[75] Contract NAS 1-29341, Modification 72, p. 2 (Exhibit US-559, p. 3).

[76] Under this contract, the work apparently cost less than anticipated, resulting in payment of less than the amount awarded, even though NASA did not modify the statement of work.

[77] Contract closeout may not occur until many years after the last payments to the contractor, so funds deobligated at that time may not be available to redirect to other agency uses.

(ii) funding that NASA allots to contracts as indicated in the contracts and modifications, as described in US RPQ 6, para. 3 and footnote 7

51. The introduction to the U.S. response to this question details the process by which NASA "allots" or "obligates" budgeted funds to contracts. The source for the obligated amounts indicated in the contracts and modifications is the same as the source for the data in the FPDS and FPDS-NG, described above in response to item (i). (That is, FPDS data come from NPMS, and FPDS-NG data are hand entered.) NASA does not retroactively correct the contract and modification documents if it discovers and corrects an error during the process of closing out a contract. Thus, while "allotment" and "obligation" of funds discussed in this item and in item (i) refer to the same concept, for practical reasons, the amounts recorded in the FPDS and FPDS-NG may differ from the amounts indicated in hard copies of the contracts.[78] In the case of a difference, the data from the FPDS and FPDS-NG more accurately reflect total amounts obligated to a contract. They also provide a good approximation of the amount disbursed under a contract, because NASA cannot disburse money to a contractor until it has obligated budgeted funds for use under that contract.

(iii) "payments" and "disbursements" in para. 212 and footnote 303 of the US First Written Submission and Exhibit US-1202

52. Paragraph 212 of the U.S. first written submission reported the $715 million dollar estimated value of NASA contracts with Boeing. "Payments" and "disbursements" are synonymous terms referring to the money NASA transfers to a contractor to pay for work covered by a contract. NASA makes these payments in response to invoices presented by the contractor that detail the work it has performed and the expenses it has incurred. As long as the funds obligated to the contract are sufficient to cover an invoice, the contracting officer may authorize payment to the contractor. NASA will then transfer funds to the contractor, usually by electronic transfer of funds.

53. The source for data on payments and disbursements for most programs for 1989 through 2004 was NASA's internal system, the NPMS. The source for disbursements under the HSR Program and VSP was SAP/BW, which allowed identification of payments funded through programs other than those challenged by the EC. In addition, SAP/BW provided the data on disbursements for 2005 and 2006, as NASA discontinued the NPMS after 2004.

54. The payments and disbursements referenced in paragraph 212 and footnote 303 are those made under the set of contracts gathered using the methodology reported in US RPQ 7, para. 14. This figure reflects the lowest estimate of the value of NASA disbursements under the challenged programs.

[78] The United States also cannot rule out the possibility that paper copies of individual contract modifications may have been lost over the long course of history covered by the EC allegations.

(iv) the "total award value" indicated in the performance evaluations submitted to the Panel

55. The total award value recorded in the contract, including as reflected in performance valuations, does not factor into the U.S. methodology for calculating the $715 million estimate of total payments to Boeing or the $775 million maximum value of contracts related to the EC claims. As indicated in the introduction to this question, the award value is the amount that NASA agrees to pay if the contractor completes the work described in a contract's statement of work. NASA may decide to change the work. If it does, it will issue a modification making necessary amendments to the statement of work and, if those amendments affect the estimated cost, modifying the award value. Sometimes, a contractor is able to complete the work for less than estimated. In that case, the disbursements (and total obligations) may be less than the amount of the award.

56. The source of the amount awarded is the cost estimate prepared by the contractor and approved by NASA's cost estimators. The value reflected in the performance evaluation is the value as of the date of contract signature, or as of the last modification that affected the estimated cost. As the total award value reflects only the expected payment, and not the actual payment or funds budgeted to a project, it is not relevant to an evaluation of the value of the EC's claims of NASA payments to Boeing or facilities, equipment, and employees allegedly provided to Boeing.

(v) the terms "value" and "maximum value" of contracts and awards as used in Exhibit US-1305 and paras. 158-159, 200, 217-218, 221-222, 224-225 of the US responses to the second set of Panel questions

57. This figure is the $775 million maximum value of NASA contracts with Boeing for research covered by the EC claims. The term "value" in the cited paragraphs refers to the value of total disbursements under the set of NASA contracts with Boeing generated in the verification exercise undertaken in response to Question 188. The "value" figure reflects the same concept as the "payments" or "disbursements" figure described in item (iii) and is derived from the same sources. However, the $775 million "maximum value" reflects the set of contracts generated in the verification exercise in response to Question 188. This contract set differs from the one that resulted in the $715 million estimate reported in paragraph 212 of the U.S. first written submission because the verification exercise resolved all disputed questions in favor of the EC position – inclusion in the estimate. The verification exercise accordingly produced a larger number, but one in the same range as the $715 million original estimate, demonstrating the reliability of NASA's data on its payments to Boeing.

58. The United States referred to the figure calculated in the verification exercise as the "maximum" value because, when the United States set out to identify contracts for research into "non-engine aeronautics" funded under one of the challenged programs, it resolved all disputed facts in favor of inclusion. Thus, the verification set includes contracts for research into topics

that, in the U.S. view, should be excluded from the EC claims. For example, the United States did not exclude contracts involving research into rotorcraft, even though this research has no relation to large civil aircraft.[79] When a contract covered both included and excluded topics, such as engines and large civil aircraft, the United States included the full value of that contract in its calculation.[80] Thus, the value produced in the verification exercise is the "maximum" that could be ascribed to the EC allegation of a financial contribution in the form of a "transfer of funds" to Boeing through NASA research contract, if all disputed facts are resolved in favor of the EC. It sets the upper limit for any evidence-based calculation of that figure. The actual value is less.

59. The data reported in Exhibit US-1305 for each contract are the most accurate figures for total payments under research contracts with NASA. These overstate the amount paid to Boeing for research into non-engine aeronautics under the challenged programs because (1) some contracts funded research that is not covered by the EC arguments; and (2) some contracts obtained funding from sources outside the challenged programs. The closest approximation of the amount of payments made to Boeing under NASA aeronautics research contracts lies between the figures reported in Exhibit US-1202 and US-1305.

(vi) the "maximum extent" of a financial contribution (US Comments on EC RPQ 170(b), para. 294)

60. This reference does not relate to payments made under NASA's contracts with Boeing. The United States made this statement with regard to the valuation of facilities, equipment, and employees that the EC alleges NASA provided to Boeing.[81] NASA does not maintain comprehensive records on the value of equipment made available to contractors under contracts, and its records regarding employees do not relate employee work hours to specific contracts, primarily because NASA employees work to advance agency, not contractor, interests. However, if the Panel were to find that these practices constituted a provision of facilities, equipment, or employees that provided a subsidy within the meaning of Article 1 of the SCM Agreement, the United States proposed that it could estimate a value for the contribution based on data reflecting Boeing's share of NASA's total spending under aeronautics research contracts.

61. For example, prior to 2004, NASA's program budgets cover all expenses for external contracting, and any internal expenses related to use of facilities or equipment related to the research programs. Thus, once the value of external contracting expenses is subtracted from the

[79] US RPQ 188, para. 220.

[80] US RPQ 188, para. 222.

[81] Specifically, these were (1) $75 million in non-reimbursed NASA contributions of facilities, equipment, and employees under Space Act Agreements with Boeing; (2) $0 for facilities, equipment, and employees explicitly listed under contracts with Boeing, because such provisions advance NASA's goals rather than the contractor's; (3) $0 for facilities, equipment, and employees not specifically listed in contracts; (4) a value of $6.5 billion for goods and services purchased from other contractors. US Comment on EC RPQ 171, para. 294; Exhibit US-1256(revised).

program budget, the remainder represents the maximum value of facilities and equipment that NASA could have devoted to carrying out research under that program. The U.S. response to Question 352 explains how the Panel can use data on Boeing's share of total NASA aeronautics research spending to derive a value for Boeing's share of remaining program budget costs.

62. Another "maximum value" analysis would look at NASA's Research & Program Management budgets. From 1989 through 2004, these budgets accounted for all of NASA's civil service personnel expenses. Therefore, they would represent the maximum value of any employee costs associated with NASA research. The method laid out in the U.S. response to Question 352 would then determine the maximum amount attributable to contracts with Boeing.

63. The evidence before the Panel allows an alternative type of "maximum value" analysis with regard to use of NASA equipment pursuant to research contracts. As the United States has explained, NASA does not have comprehensive records to allow a valuation of all goods provided to Boeing for use in fulfilling its research contracts. However, the EC has identified stitching machines provided under one contract, NAS 1-20546, as its primary example of NASA equipment provided to Boeing.[82] The contract in question is the only one to highlight the provision of equipment, indicating that the equipment provided was unusually significant. The modifications to that contract carefully track not just the stitching machine, but all equipment provided to Boeing, down to component containers worth $300. This record, which covers the entire life of the contract, shows that NASA allowed Boeing use of equipment worth a total of $11,015,301[83] to fulfill the contract. Disbursements for research services under the contract amounted to $74,432,801, indicating that even under an equipment-intensive contract, NASA-provided equipment was worth approximately 14.8 percent as much as disbursements. Of course, Boeing did not get to keep this equipment, but had to return it, sell it and give the proceeds to NASA, or prove that the equipment had no value other than as scrap.[84]

64. The United States has explained elsewhere why the work of NASA employees and the use of NASA equipment under research contracts do not represent a financial contribution and confer no benefit.[85] However, a consideration of the maximum value attributable to such contributions demonstrates that in any event, they have nowhere near the inflated value that the EC attempts to ascribe to them.

65. The United States emphasizes that this is a contingent rebuttal, put forward for consideration only if the Panel concludes that NASA provided facilities, equipment, or

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[82] EC FWS, para. 519; EC SWS , para. 388; EC Comments on US RPQ 186, para. 195.

[83] *List of Government-furnished property under Contract NAS1-20546* (Exhibit US-1334).

[84] Contract NAS1-20546, section I.1 (Exhibit US-412, p. 33/75), incorporating 48 C.F.R. § 52.245-5(h) (1986) (Exhibit US-1336).

[85] US FWS, paras. 262-269; US SNCOS, paras. 28-31; US RPQ 186, para. 207; US RPQ 212, para. 337, US Comment on EC RPQ 148(e), para. 169; US Comment on EC RPQ 171, para, 275.

employees to Boeing, and that portions of the non-contract share of the relevant program budgets represents the value of facilities, equipment, or empolyees provided to NASA contractors.

a) Please confirm whether the amounts listed under the column entitled "disbursements" in Exhibit US-1202 are the cumulative amounts paid to Boeing under the R&D contracts as described in the United States' explanation of the term "disbursements" at footnote 303 to para. 212 of its FWS, which were obtained from data contained in NASA's Procurement Management System (NPMS) or NASA's internal financial records. In this regard, please explain the following statements from US RPQ 181, para. 187 (emphasis added): "Question 7 inquired how the United States derived the $750 million value for all NASA contracts with Boeing under the programs challenged by the EC. Accordingly, the response focused on the Federal Procurement Data Base ("FPDS"), which provided the source for monetary values, *and the NASA Procurement Management System ("NPMS"), which provided greater detail on the FPDS data for the pre-2005 period."*

66. The United States confirms that the amounts listed under the column entitled "disbursements" in Exhibit US-1202 are the cumulative amounts paid to Boeing under R&D contracts, as described in footnote 303 to para. 212 of the US FWS. NASA obtained these data from the NPMS for the 1989-2004 period for most programs, and from the SAP/BW system for the HSR Program and VSP. Data for all programs for 2005 and 2006 came from SAP/BW. In that exercise, the United States did not include disbursements that, according to NASA records, were not funded through one of eight challenged programs. The FPDS and FPDS-NG were the "source" in that they are the central database for U.S. government procurement data, and are linked to the NPMS.

b) Please indicate the source of the dollar figures of each of the contracts listed in Exhibit US-1305, and in this regard, explain why the "maximum value" of the following contracts appearing on Exhibit US-1305 differs from the amounts listed under the column "disbursements" for those contracts in Exhibit US-1202:

NAS1 20267
NAS1 97040
NAS1 20014
NAS1 20341
NAS1 20342
NAS1 20013
NAS1 20220
NAS1 00086
NAS1 00106
NAS1 99070
NNL04AA29C
NNL04AA30C

NNL05AB29T

67. The sources for the dollar figures for each of the contracts listed in Exhibit US-1305 were the NPMS for the 1989-2004 period, and the FPDS-NG system for 2005 and 2006.[86] There were several reasons why the figures in Exhibit US-1305 differed from those reported in Exhibit US-1202.

68. **Contracts NAS1-20013, NAS1-20014, NAS1-20220, NAS1-00086, NAS1-00106, and NAS1-99070.** The differences between the figures for these contracts arise from the different processes used to generate the two exhibits. Exhibit US-1202 provides greater detail on the calculations used to derive the table in paragraph 212 of the US FWS, which reported NASA payments to Boeing for the "non-engine civil aeronautics" research described by the EC under each of the challenged programs. In performing this exercise, NASA first took steps to identify contracts that covered non-engine aeronautics research and exclude contracts that did not. Afterward, for each contract that covered both non-engine civil aeronautics research and excluded research, it took additional steps to subtract payments under those contracts associated with elements related to non-subject research. [87] In contrast, Exhibit US-1305 reflects NASA's verification exercise, which sought to determine the *maximum* value of payments for research covered by the EC arguments. When NASA found a contract for both non-engine civil aeronautics research and excluded research, it reported the full value of payments under the contract, and subtracted nothing to reflect the excluded research.[88] For these contracts, the subtractions to remove excluded research explain the differences between figures in Exhibit US-1202 and US-1305.

69. Contract NAS1-20013, with Boeing, had two objectives: "(a) critical technologies for economically viable Mach 2.4 high-speed commerical transport aircraft and (b) lightweight hot structures for hypersonic vehicles which offer reliable high-termperature performance for repeated missions."[89] As the United States has noted, supersonic and hypersonic flight create vastly different physical problems. The performance goals and materials investigated for the supersonic research components differed markedly from those for the hypersonic component.[90]

[86] Rather than use SAP/BW data for 2005 and 2006 – which resulted in the double-counting of some payments in Exhibit US-1202 data that is described below – NASA valued disbursements in 2005 and 2006 as equal to the obligations reported in the FPDS-NG. This figure from the FPDS-NG amounted to less than 2 percent of total 1989-2006 disbursements to Boeing and McDonnell Douglas ($9,587,149 out of the $774,689,987 maximum value).

[87] US RPQ 179, paras. 180-182.

[88] US RPQ 188, para. 222.

[89] Contract NAS1-20013, Exhibit A, p. 29 (Exhibit US-538(HSBI)).

[90] The supersonic component of the research investigated "airframe structural applications in the 100º to 204ºC (212º to 400º) regime, while the hypersonic component investigated "airframe components which will operate in the 315º to 1650ºC (600º to 3000º) range." Contract NAS1-20013, Exhibit A, p. 29 (Exhibit US-538(HSBI)). The supersonic component of the research considered "polymeric matrix composites, adhesives, sealants, light alloys and metal-matrix composites," while the hypersonic component considered "thin-gage, light-alloy metal matrix and carbon-carbon composites." *Ibid.*

Contract NAS1-20014, with McDonnell Douglas, had the same objectives.[91] Contract NAS1-20220 had a limited amount of excluded disbursements. Contract NAS1-00086 covered "research in accoustics and noise control for aircraft and space transportation vehicles."[92] Contract NAS1-00106 covered "flight critical systems research, and included research on reducing the costs of space transportation as one of its goals.[93] Contract NAS1-99070 called for a research with three "thrusts," one of them being "achievement of a ten-fold reduction in the cost of placing payloads in low earth orbit through integration of aeronautical principles with comercial launch vehicles."[94] As the EC stated that hypersonic flight and space research were not subject to its claims, NASA subtracted disbursements for any such research from the values reported in Exhibit US-1202 and paragraph 212 of the U.S. first written submission. It made no such adjustment for figures reported in Exhibit US-1305.

70. **Contracts NAS1-20267, NAS1-97040, NAS1-20341, and NAS1-20342.** To match its contract-related disbursements data to the EC's program-based subsidy allegations, NASA used funding data from the SAP/BW system and other records.[95] In some instances, these records incorrectly double-listed disbursements as having been funded simultaneously under two programs. When that happened, the disbursements were double counted in the total.[96] The disbursements reported in Exhibit US-1305 for these contracts are the correct ones.

71. **Contracts NNL04AA29C, NNL04AA30C, and NNL05AB29T.** These contracts were awarded in 2004 and 2005 under the VSP program. As the United States explained in its

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[91] Contract NAS1-20014, Exhibit A, p. 29 (Exhibit US-541(HSBI)).

[92] Contract NAS1-00086, p. 3 (Exhibit US-472(BCI)).

[93] Goal 9 of the contract is to:

> Goal 9 – Reduce the payload cost to low-Earth orbit by an order of magnitude from $10,000 to $1,000 per pound within 19 years, and by an additional order of magnitude, from thousands to hundreds of dollars per pound, within 25 years.

Contract NAS1-00106, p. 4 (Exhibit US-1344).

[94] Contract NAS1-99070, p. 2 (Exhibit US-477(BCI)).

[95] US RPQ 179, para. 183.

[96] For example, the Exhibit US-1305 figure for disbursements under NAS1-20267 is $21,855,232. This same figure appears in Exhibit US-1202 as disbursements funded under the AST Program. However, Exhibit US-1202 lists an additional $85,400 in disbursements under the HSR Program. This additional amount was, in fact, double-counted, and represents the difference between the total disbursements reported in Exhibits US-1202 and US-1305. Similarly, for Contract NAS1-97040, the amount reported in Exhibit US-1305 is the sum of the values reported in Exhibit US-1202 as funded under the AST and QAT programs. Exhibit US-1202 also lists disbursements of $144,615 under the HSR Program and $1,926,863 under the Aviation Safety Program, which were double-counted, and represent the difference between the two exhibits. For Contract NAS1-20341, the Exhibit US-1305 figure is the sum of the Exhibit US-1202 figures for the AST and Aviation Safety Programs. Additional disbursements listed in Exhibit US-1202 as under the HSR Program were double-counted, and explain the difference between the two exhibits. The data in Exhibit US-1202 regarding Contract NAS1-20342 also had a double-counting problem.

response to Question 334, the figures reported in paragraph 212 of the U.S. first written submission and Exhibit US-1202 did not reflect changes made when NASA ended VSP and started the Fundamental Aeronautics Program. Exhibit US-1305 did reflect the changes resulting from that new program, including capturing all procurement actions, which explains any differences between the figures reported in Exhibits US-1202 and US-1305 for these contracts.

c) Was the $7.446 billion "estimated value of total funding for aeronautics-related research" set forth in US RPQ 175, para. 159 calculated based on the amount of funds obligated under awards as reported in the FPDS/FPDS-NG? How does the measure of funding used to calculate the estimated value of total funding for aeronautics-related research in US RPQ 175 para. 159 relate to the measure of funding used to calculate the "maximum value of Boeing contracts related to EC-challenged R&D of $775 million"; more specifically, in light of what the Panel understands to be potentially significant differences between the expected value of a contract at the time of the award and the amounts actually disbursed (see e.g., US RPQ 184, para. 191), is the $775 million figure based on disbursements data and therefore not comparable with the $7.446 billion figure?

72. The $7.446 billion figure reported in US RPQ 175 was based on the amount of funds obligated under contracts, as reported in the FPDS and FPDS-NG, for *all* aeronautics research contracts with all suppliers. The Panel is also correct that the $775 million maximum value of disbursements was calculated based on disbursements data. However, it is comparable to the $7.446 billion figure for aeronautics research contracts with all suppliers, which is based on obligations data, because, while obligations are always greater than or equal to the amount disbursed, the difference is typically not large.[97]

73. In addition, while the use of obligations data would tend to overestimate disbursements somewhat, other factors in NASA's estimating process tend toward an underestimate. Specifically, NASA's first step in identifying aeronautics research contracts with all suppliers was to identify contracts with the Products and Service Code ("PSC") that NASA assigns to aeronautics and space research. Further review of the Boeing contracts set gathered for the U.S. first written submission made clear that some aeronautics research occurs under other PSCs. Therefore, the process used to generate the data in the U.S. response to Question 175 likely omitted some research contracts, which would result in an underestimate of the value of research contracts. The actual value of all research contracts with all suppliers under the challenged NASA programs is probably greater, meaning that a precise calculation would show Boeing

[97] Since obligations will equal disbursements after close-out of a contract, the obligations and disbursements for a group of old contracts that have mostly closed, like those at issue in this dispute, will usually be quite close. (The U.S. response to Question 336(i) addresses this point in greater detail.) For example, the value of funds obligated under the contracts listed in Exhibit US-1305, as reported in the FPDS and FPDS-NG, differed from the value of disbursements by 0.09 percent – a difference so small that the value in millions of dollars was the same for both – $775 million.

having a smaller share of NASA's contract spending under the challenged programs than is reported in US RPQ 175.

74. The United States notes that, as the Appellate Body found in *US – Cotton Subsidies*, "a precise, definitive quantification of the subsidy is not required" in an analysis of the amount and magnitude of alleged subsidies.[98] The Panel should find the estimates provided by the United States in response to questions 175 and 188 to be sufficient – and sufficiently comparable – to satisfy this standard.

75. The Panel is correct that the amount awarded reflects the expected value at the time of the award, and may differ greatly from the total amount disbursed. However, the amount obligated at any time is usually less – and often far less – than the amount of the initial award because NASA obligates funds incrementally, as necessary to cover disbursements expected in the short term. Thus, the amount obligated roughly tracks ongoing disbursements, but not the amount of the initial award.

d) Is the Panel's understanding correct that none of the copies of the contracts submitted in the form of exhibits serve, of themselves, as evidence for the figures that appear in exhibit US-1202 or in US-1305?

76. The Panel's understanding is correct.

337. The Panel understands, on the basis of the information provided in Exhibit US-1304 and the United States' explanation, in RPQ 188, para. 221, that the United States considers that contract NAS 3 27330 was incorrectly included in the calculation of payments to Boeing under NASA aeronautics programmes challenged by the European Communities in Exhibit US-1202 because it involved purchases of equipment. If this understanding is correct, please explain the basis for the United States' view that contract NAS 3 27330 involves purchases of equipment. If this understanding is not correct, please explain the reason why the United States considers that contract NAS 3 27330 was incorrectly included in the calculation of payments to Boeing under NASA aeronautics programmes challenged by the European Communities in Exhibit US-1202.

77. The Panel's understanding is correct. The contract NAS 3 27330 was a contract for the planning and design of the National Wind Tunnel Complex, a set of state-of-the-art wind tunnels that NASA hoped to build in the mid-1990s.[99] As the contract's revised statement of work, incorporated into Modification 12, indicates:

> This effort focuses on the required planning studies (Phase 1) and initiation of preliminary design activities (Phase 2A) associated with the development of the

[98] *US – Cotton Subsidies (AB)*, para. 467.

[99] NWTC Final Report, NASA Doc. No. CR-198491, p. 1 (June 7, 1996) (Exhibit US-1337).

> NWTC. In order to accomplish this effort, the NASA Wind Tunnel Program Office (WTPO) will enter into a contract with The Boeing Company, who in turn will establish an Industry Team to direct and carry out the tasks defined by this Statement of Work. It is recognized that this Statement of Work is an interim document that will be revised and updated as appropriate but not without direction or approval of the government.[100]

NASA designed this contract to support the first step in an integrated design-and-build project that would end with the construction of the two wind tunnels. As the final report generated under the contract explains:

> The Project scope included all aspects of the NWTC acquisition:
>
> • establishing detailed requirements, based on NFS national consensus requirements and input from Government and Industry partners
>
> • preliminary planning
>
> • conceptual design and studies
>
> • preliminary and final design
>
> • procurement, fabrication, and construction
>
> • activation, calibration, and customer verification testing
>
> Although not clearly stated in the documentation, the intent was to establish a commercially viable complex without long term government or industry financial subsidies.[101]

Thus, the contract did not involve any research and development. It was, in fact, part of a purchase of equipment, namely, two wind tunnels.

78. However, NASA had to terminate the effort:

> A Systems Design Review (SDR) for the two-tunnel configuration was held in October 1995. The Project was contractually redirected in October 1995 to a single Multi-Purpose Wind Tunnel (MPWT). . . . NASA directed the NWTC to

[100] Contract NAS 3-27330, Modification 12 (Exhibit US-587, p. 9/42).

[101] NWTC Final Report, NASA Doc. No. CR-198491, pp. 2-3 (June 7, 1996) (Exhibit US-1337).

> conduct an orderly phase out and closure following the MPWT SDR because of the "current fiscal situation".[102]

The NWTC final report explains further that financing presented the critical problem. The government-industry team studying the project considered borrowing money to fund the wind tunnels, but concluded that "current market price of wind tunnel testing would not support repayment of the incurred debt of the facility."[103] They finally proposed a joint-funding plan, with industry paying $200 million of the proposed total $1.2 billion cost. However, the report states "it should be noted that a commitment had not been secured from the Government."[104] The final outcome of the NWTC effort highlights that, even when industry contributes to funding, NASA seeks market-based pricing that covers its costs.

79. The United States considers that, as the contract was aimed at purchasing equipment for NASA, it is outside the scope of the programs challenged by the EC. The final report indicates an additional reason to consider the contract irrelevant to the EC claims. Specifically, the contract aimed not at developing new aeronautics technology, but at identifying various government and industry needs for immense new testing facilities, creating wind tunnel designs to meet those needs, and constructing the wind tunnels themselves. The science to make these huge earth-bound laboratories is entirely different from the science needed to make an aircraft fly. Moreover, if NASA had actually built one or two new wind tunnels, it would, like other NASA wind tunnels, have been available to both Boeing and Airbus for testing of aircraft designs.[105] In that case, it would certainly have contributed to the development of aeronautics knowledge. However, since NASA did not build any new wind tunnels, there was no technology development of the kind covered by the EC claims, and no facilities, equipment, or employees that might have been provided to Boeing.

80. The Panel should also note that the NWTC was not devoted to civil aircraft. The project scope explicitly covered military aircraft.[106] The design team included producers of military aircraft and engines.[107]

338. Please explain whether (i) the steps that NASA took to eliminate awards that did not pertain to NASA aeronautics programmes described in US RPQ 179, para. 180, specifically, "NASA filtered the FPDS all Boeing contracts list to remove all contracts

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[102] NWTC Final Report, NASA Doc. No. CR-198491, p. 1 (June 7, 1996) (Exhibit US-1337).

[103] NWTC Final Report, NASA Doc. No. CR-198491, p. 10 (June 7, 1996) (Exhibit US-1337).

[104] NWTC Final Report, NASA Doc. No. CR-198491, p. 10 (June 7, 1996) (Exhibit US-1337).

[105] The project team's extreme sensitivity to finances and cost coverage indicate that they were in no position to turn away paying customers. In fact, the wind tunnel report indicates that Boeing does much of its test of civil aircraft in European wind tunnels, which offer some capabilities unavailable at the NASA tunnels.

[106] NWTC Final Report, NASA Doc. No. CR-198491, p. 1 (June 7, 1996) (Exhibit US-1337).

[107] NWTC Final Report, NASA Doc. No. CR-198491, p. 1 (June 7, 1996) (Exhibit US-1337).

awarded by the five centers that do not perform aeronautics research – Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center, Marshall Space Flight Center and Stennis Center"; and (ii) the steps that NASA took when it "identified contracts in that all Boeing contracts list that were awarded by NASA centers that perform no aeronautics research, and filtered those contracts from the results of the all Boeing contracts query" as described in US RPQ 188, para. 218, were identical, and if not, precisely how they differed.

81. The steps identified in the Panel's question were the identical. After the step of identifying contracts awarded by the four NASA aeronautics centers, the processes diverged as described in the U.S. responses to Questions 179 and 188.

339. In addition, please indicate whether the Panel is correct in understanding that, as a factual matter, all contracts that are related to the European Communities' challenges to non-engine aeronautics research must have been awarded by the four NASA centers that are responsible for all aeronautics research conducted by NASA and cannot have been awarded by any other NASA center or unit.

82. The Panel's understanding is correct. The EC challenge relates to a group of named research programs, all of them involving aeronautics research. All of NASA's expenditures, including procurements, cooperative agreements, and grants, are administered through one of the various centers. Only four of the centers – Langley Research Center, Glenn Research Center (formerly known as Lewis), Ames Research Center, and Dryden Flight Research Center – perform aeronautics research.[108] These centers administered all of the aeronautics research under the programs challenged by the EC. The remaining centers were not responsible for administering any of the programs challenged by the EC. It is NASA policy that the center implementing a research program is responsible for awarding any contracts, cooperative agreements, or grants to perform research under that program. Therefore, all contracts (and cooperative agreements) that are related to the EC challenges to non-engine aeronautics research must have been awarded by those four NASA centers, and cannot have been awarded by any other NASA center or unit.

340. On 28 April 2008, the United States submitted a correction to the figure reported in paras. 218 and 223 of US RPQ 188 of the value of contracts awarded by non-aero centers. The United States indicated on that occasion that "{i}n an effort to ensure the highest degree of accuracy in the data submitted to the Panel, NASA has spent the last ten days double-checking the figures reported in the answer". Can the United States explain the nature of the review process that led to this correction?

[108] The Panel should note that some of these centers did perform non-aeronautics research. Glenn Research Center also performs research on rocket propulsion, Ames Research Center also performs computer research related to space flight, and Dryden Flight Research Center tests spacecraft.

83. In the review process, NASA personnel double-checked every step of the work they performed and compared the data reported to the Panel with the original source data. One checking step was to check calculated annual cumulative disbursements to Boeing and McDonnell Douglas as reported to the Panel against annual cumulative disbursement in the NPMS/FPDS databases. The review revealed that an error that had been previously found in a space-related contract had been corrected only in cumulative disbursements data, but not in annual disbursements data. Further investigation of purchase order information verified the existence of the error and accuracy of the correction. After this correction, NASA observed no other inconsistencies within the data.

341. In EC Comments on US RPQ 188, the European Communities asserts that "{i}n short, the United States' proposed verification does virtually nothing to address the key omissions in the US calculations that have been identified by the European Communities" (EC Comments on US RPQ 188, para. 208) How does the United States respond to this criticism? In particular, how does the United States respond to the following assertions:

84. The United States submitted its verification exercise in response to Panel Question 188, which asked to explain how the Panel could satisfy itself that the information submitted by the United States with regard to "all relevant contracts and agreements between NASA and Boeing MD" is "accurate and complete." The exercise demonstrated that even if all disputed facts are resolved in favor of the EC, including treatment of rotorcraft as related to large civil aircraft, the value of NASA's contracts with Boeing funded under the challenged programs was *at most* $775 million from 1989 to 2006. Moreover, the Panel's record contains copies of most of the contracts that generated these disbursements, which document the nature of the research conducted and the funding obligated to accomplish that research.[109] The EC has never questioned the accuracy of the information contained in the contracts and associated documents submitted by the United States. And, indeed, those documents are accurate copies of the originals. Thus, the U.S. verification exercise has demonstrated that the information on NASA contracts submitted to the Panel is both accurate and substantially complete.

85. Therefore, the general response to the EC criticism is that the verification exercise did not address all of the "key omissions" asserted by the EC because that is not what the Panel asked. In fact, the United States had already addressed other criticisms elsewhere, so that it would have been redundant to address them a second time in the verification exercise.[110]

[109] US RPQ 225, para. 255. The contract modifications indicate funding through the life of the contract. The electronic data will often differ, as they reflect corrections made afterward and adjustments made at the time of contract close-out. However, the contract documents attest to the basic accuracy of the overall data submitted by NASA.

[110] Exhibit US-1256(revised) presented information regarding provision of facilities, equipment, and employees to Boeing pursuant to Space Act Agreements. US RPQ 186, paras. 201-203 addresses the EC's criticism

86. The remainder of the response to this question addresses each of the EC assertions identified by the Panel in turn.

> *(a) "The European Communities is particularly surprised that the so-called "verification" proposed by the United States is not performed at the level of the individual NASA programmes at issue in this dispute. In other words, the proposed US verification does not allow the European Communities or the Panel to understand where all of the budgeted funding for each challenged programme actually goes, and for what purpose." (EC, Comments on US RPQ 188, para. 203 (italics in original))*

87. The United States first notes that the Panel did not ask for a verification at the level of each program. It asked whether the United States could demonstrate that its information with regard to "all relevant contracts" is "accurate and complete." The exercise showed that the information was accurate and substantially complete. It also proved that the EC has greatly exaggerated the total amount of budgeted funding NASA provided to Boeing.

88. The EC criticism is also wrong. The United States did provide information related to the level of the individual NASA programs, as Exhibit US-1305 showed the primary program funding source for each contract captured in the verification exercises. Exhibit US-1255 provided information on all expenditures under two programs. The HSR Program Plan submitted by the EC provides greater detail on the HSR Program that generally disproves the EC allegations regarding that program.[111]

89. Finally, the EC criticism is also irrelevant. The EC has challenged NASA funding *to Boeing*. Thus, by the very terms of the EC's challenge, there is no need for the Panel or the EC to "understand where all of the budgeted funding for each challenged program actually goes." Once it is clear – as it has always been – that all program funding does not go to Boeing, the EC bears the burden of explaining why the Panel should treat funding to other entities as funding to Boeing. It has failed to meet this burden.

> *(b) "Moreover, the United States' verification does absolutely nothing to account for the value of goods and services provided to Boeing through each programme, instead focusing exclusively on the direct transfers of funds from NASA, in general." (EC Comments on US RPQ 188, para. 203 (italics in original)).*

90. Once again, the EC criticism goes to a question that the Panel did not ask, and that the verification exercise did not purport to answer. The Panel asked whether the United States could

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of NASA's data collection systems. US RPQ 186, paras. 206-211 addresses EC assertions that NASA failed to disclose goods and services provided to Boeing.

[111] US Comment on EC RPQ 166, paras. 263-268; U.S. reply to Question 344, *infra.*

demonstrate that its information with regard to "all relevant contracts" is "accurate and complete." The exercise showed that the information was substantially complete and accurate.

91. The EC in its submissions has treated the alleged provision of goods and services as a separate financial contribution, with a separate benefit. It is entirely appropriate for the United States to address those assertions separately. The United States explained in its response to Panel Question 186 the steps it took to ensure that it identified and reported all provisions of goods and services from NASA to Boeing, and why the Panel can consider that information complete and accurate.[112] Thus, there was no need to include the alleged provisions of goods and services in response to a question as to whether information on contracts was accurate and complete. The U.S. discusses the calculations related to provisions of goods and services further in its response to Question 352.

92. In any event, the value of NASA contracting with suppliers other than Boeing is not relevant to the value of goods and services provided to Boeing because money paid to other entities cannot be money paid to Boeing or goods and services provided to Boeing. The EC tries to argue that NASA used payments to other contractors to purchase goods and services that it then provided to Boeing.[113] However, the EC provides no evidence that any such transfers occurred. In fact, to treat payments to other contractors as benefits to Boeing would contradict the core of the EC argument for treating NASA research as a subsidy – the (incorrect) assertion that any research resulting from a NASA contract is worthless to anyone but the contractor.[114] The Panel should, therefore, give no credence to the EC's assertions that payments to other contractors are benefits to Boeing.

> *(c) "Notably, the United States appears to be asking the Panel and the European Communities to make leaps of faith to accept the judgment calls of NASA personnel about whether or not particular contracts are LCA-related, including the idea that 'NASA erred on the side of inclusion.' Given the tremendous disagreement between the parties throughout this dispute about what is and is not LCA-related, the European Communities cannot accept a subjective "exercise" performed by NASA unless the European Communities can access all of the contracts and records at the disposal of the NASA employees." (EC Comments on US RPQ 188, para. 205 (italics in original)).*

93. In asking the panel to rely on the $775 million maximum value figure, the United States is not asking the Panel to make any "leaps of faith" in NASA's subjective judgment. In the first place, the overwhelming majority of contracts excluded from the data set were excluded for manifestly *objective* reasons, namely, that they were awarded by NASA centers that (1) do not

[112] US RPQ 186, paras. 206-211.

[113] EC Comments on US RPQ 177, para. 172.

[114] EC SWS, paras. 375 and 381.

perform aeronautics research and (2) were not responsible for the programs challenged by the EC.[115] These excluded contracts represented 96.5 percent of NASA's purchases from Boeing,[116] and NASA applied no subjective judgment in excluding them from the data set. This result comports with the evidence before the Panel which demonstrates that NASA devotes the large majority of its funds to space exploration, and that in this area it contracts with Boeing to buy not only research services, but also expensive space vehicles, including space shuttles and satellites.[117]

94. For the remaining contracts, the United States asks the Panel to rely on the objective judgments of the NASA officials who reviewed the descriptions of the work done under the contracts. They are accomplished scientists and engineers with decades of experience in the field of aeronautics, who are well qualified to decide, based on objective criteria, whether a research project involved space, large civil aircraft, airspace, hypersonics, or any of the other categories used in the exercise.[118] The only potential for application of subjective judgment was in the limited number of situations in which a contract covered more than one topic, and had to be assigned to one category. However, when contracts covered large civil aircraft and another topic, NASA conservatively placed them in the large civil aircraft category for purposes of the verification exercise, removing any concern that a subjective judgment would result in the omission of any contract even partially funded under the challenged programs.

95. In any event, the United States is not asking the Panel to make "leaps of faith" in NASA's judgment regarding contract descriptions. In its review of contracts awarded by the four aeronautics centers, NASA identified and excluded non-LCA-related contracts under which Boeing received $281 million in disbursements. Samples of the statements of work from these contracts, which the United States submitted as exhibits, demonstrate the objective validity of NASA's judgment that they called research outside the scope of the EC's challenge.[119]

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[115] US RPQ 188, para. 218. The United States notes that in the EC's extensive descriptions of NASA's aeronautics research activities, it never alleges that the Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center, Marshall Space Flight Center, and Stennis Center conducted research related to the challenged NASA programs.

[116] US RPQ 188, para. 218.

[117] Aeronautics research accounted for between 12 and 14 percent of NASA's total research budget in FY2003 and FY2004. NASA, Fiscal Year 2004 Budget Estimates, p. S&AP 2-5 (Exhibit EC-315).

[118] US RPQ 188, para. 220 provides a list of these topics.

[119] *See Contracts Incorrectly Included in Calculation of Payments to Boeing Under NASA Aeronautics Programs Challenged by the EC in Exhibit US-1202* (Exhibit US-1304). Statements of work for three of the contracts mistakenly referenced in Exhibit US-1202 were submitted as exhibits: NAS 3-27330, 4-00041, and 4-02013. Exhibit US-587, pp. 9-13/42; Exhibit US-440, pp. 52-55; Exhibit US-441, pp. 35-38. The U.S. response to Question 337 discusses Contract NAS 3-27330 in detail. Contract 3-01140, for Revolutionary Aero-Space Engine Research, which was from the sample set at an earlier stage as engine research. Its amended statement of work appears at US-577(HSBI), pp. 6-11/309. The final value of funds allotted to the contract was $9.5 million. Contract NAS-3-01140, Modification 76, Exhibit US-577(HSBI), p. 79/309. (The final amount obligated was

96. Finally, even if the Panel decides to reject all of NASA's objective and conservative judgments regarding contracts awarded to Boeing by the aeronautics centers that fall outside the EC's claims, the fact remains that *all* contracts with Boeing funded by the challenged programs were worth, at most, $1.05 billion. This figure represents the total value of *all* contracts awarded to Boeing by the four centers during the relevant period, including those related to research outside the EC's claim. This total value of all contracts with the four aeronautics centers verifies the fundamental point that the United States has made since its first written submission remains – that NASA's funding of contracts directly with Boeing represents a very small portion of the total amount that the EC attributes to Boeing as "funding" under the challenged programs. The EC has provided neither evidence nor argument that would support treating the remainder of contract funding under the challenged programs – all of which went to contractors unrelated to Boeing and NASA employees – as a subsidy to Boeing.

> *(d) "As for the specific comparison made in exhibit US-1301, where the United States compares the numbers in the highly-flawed FPDS/FPDS-NG database with the NASA Annual Procurement Reports, this does absolutely nothing to support the United States' defence. As the United States explains in its response to Question 188, '{t}he FPDS and FPDS-NG were the source for the Annual Procurement Report data.' Thus, all that the United States does in exhibit US-1301 is to compare the information presented in summary-type reports (i.e., the NASA Annual Procurement Reports) with the data that was used to create those same summary-type reports (i.e., data from the FPDS and FPDS-NG). The fact that there are not major discrepancies between these two sources shows merely that the people that produce the NASA Annual Procurement Reports know how to summarise and compile data (although, incidentally, their abilities seem to have taken a turn for the worse in recent years 2005-2006). It does nothing to clarify the extent to which the United States has captured the direct transfers of funds, and provisions of goods and services, to Boeing through the NASA programmes at issue in this dispute." (EC Comments on US RPQ 188, para. 207 (italics in original)).*

97. The EC makes a number of arguments in this lengthy passage, and all are specious.

98. To begin with, NASA's Annual Procurement Report is recognized by the U.S. government as an accurate summary of NASA's disbursements under contracts during a particular year, and used generally for the compilation of government statistics.[120] The EC has itself put forward the NASA's Top 100 Contractors data from the Annual Procurement Reports for 1991 through 2004 – the same data the United States used in its verification exercise – as data

mistakenly designated as HSBI in this exhibit. If the Panel wishes, the United States will submit a revised version of the exhibit.)

[120] US RPQ 7, para. 12.

on which the Panel can rely.[121] Thus, it is difficult to see how the EC can now ask the Panel to reject that report as an accurate top-level valuation of NASA's total disbursements under its contracts with Boeing.

99. The close match between the Annual Procurement Report data and data currently in the FPDS and FPDS-NG demonstrates that those databases accurately reflect the universe of NASA disbursements under contracts with Boeing. The EC attempts to make light of this observation by asserting that it attests only to NASA employees' ability to compile data from individual disbursements into an aggregate for U.S. government statistical purposes.[122] That, however, is the critical point that the EC frequently attempts to obscure – that NASA does an excellent job monitoring and recording disbursements data. Even the U.S. Government Accountability Office ("GAO"), which has frequently criticized NASA, recognizes that the agency's systems for making and recording disbursements are overall accurate.[123] The fact that NASA's query of the FPDS and FPDS-NG consistently produced values for total disbursements under contracts with Boeing that conform with the Annual Procurement Reports data, which is recognized as accurate, provides strong evidence that the verification exercise correctly identified all contracts between NASA and Boeing. Thus, the data set used by NASA is itself complete.

100. The EC attempts to avoid this conclusion by parroting the assertion made in its response to Panel Question 173(b) that the FPDS data are "highly-flawed." The United States disproved this assertion in its comment on the EC response to that question.[124] The United States pointed out that the only support the EC cites for its attack on the FPDS was a GAO report that focused on two concerns: *DoD*'s lack of participation in the FPDS-*NG* and uneven data quality because agencies varied in the degree to which they entered data in particular fields. The report contained no criticism of NASA. Moreover, the existence of differences in how agencies

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[121] The EC submitted the lists of NASA Top 100 contractors excerpted from NASA Annual Procurement Report as Exhibit EC-341. It cited that compilation, and also used that compilation as the basis for the exhibit entitled Boeing's Share of NASA Contracts, FY 1991-FY 2004 (Exhibit EC-19), which it cited extensively in its first written submission. EC FWS, notes 833, 888, 931, 964, 992, 1026, 1046, 1077, 1508, and 1579.

[122] The EC also notes that the results of the FPDS/FPDS-NG query did not match the Annual Procurement Report total as closely in 2005 and 2006 as they did in preceding years. The United States observes that 2005 was the year that NASA moved to the FPDS-NG system, and discontinued use of the FPDS and NPMS systems. We also note that the differences between 2005 and 2006 are largely offsetting, as the FPDS data was 2.04 percent higher than the Annual Procurement Report for 2005, but 2.13 percent *lower* in 2006. The logical conclusion is that in its first year of operating FPDS-NG, some disbursements were mistakenly booked to the wrong year, and the error was corrected in the FPDS-NG after publication of the Annual Report.

[123] US RPQ 186, para. 201; General Account Office, Report GAO-02-642R NASA Contract Payments, p. 2 (Exhibit US-1273). The GAO report also recognizes that NASA moves quickly to correct clerical errors when discovered. Corrections are one explanation for the small divergences between FPDS data and Annual Procurement Report data for the 1989-2004 period. When NASA discovers errors in FPDS, it corrects them. However, it does not issue errata for the Annual Procurement Report. Thus, the FPDS data is the most accurate available data on NASA disbursements.

[124] US RPQ 173(b), paras. 305-309.

recorded data in the FPDS-NG provides no reason to question the use of data for one agency. The report did note the existence of data entry errors, but those will be an issue in any data collection system.[125] That should not cause concern with regard to NASA, as GAO has noted that NASA finds and corrects errors in disbursements data.[126] Finally, the Panel should note that GAO directed its criticism at FPDS-NG, so that its conclusions have no relevance to an evaluation of the data from the original FPDS or the NPMS, which underlay NASA's estimates.[127]

101. Thus, the comparisons in Exhibit US-1301 do "clarify" that the United States has, in the words of the EC "captured the direct transfers of funds . . . to Boeing through the NASA programmes at issue in this dispute." As for whether the exercise captured data on "provisions of goods and services," the United States pointed out above that the Panel asked for verification of the completeness and accuracy of information related to provisions under the *relevant contracts*. The United States has accordingly – and entirely appropriately – addressed the issue of provision of goods and services elsewhere, and does so again in its response to Question 352.[128]

102. Finally, the EC's criticisms of the FPDS and FPDS-NG miss another critical point – all of the data placed in evidence with the Panel originate in NASA's computer systems. All of these systems have their critics. The question for the Panel is which set of data is entitled to greater weight. In this regard, it is telling that EC calculations start with budget data for NASA programs and attempt to deduce the value of procurement contracts with Boeing and goods and services supposedly provided to Boeing based on a number of unsupported assumptions.[129] In contrast, the U.S. calculation of payments to Boeing relies on facts that identify NASA contracts with Boeing, the centers that participated in aeronautics research, and the topics of specific

[125] US RPQ 173(b), para. 305.

[126] General Accounting Office, Report GAO-02-642R NASA Contract Payments, p. 2 (Exhibit US-1273); US RPQ 186, para. 201; US Comments on EC RPQ 173(a), para. 304.

[127] US RPQ 179, paras. 183-184. Of the $775 million maximum value of aeronautics research awarded to Boeing, only $9.6 million was derived from the FPDS-NG.

[128] Exhibit US-1256(revised) presented information regarding provision of facilities, equipment, and employees to Boeing pursuant to Space Act Agreements. US RPQ 186, paras. 201-203 addresses EC of NASA's data collection systems. US RPQ 186, paras. 206-211 addresses EC assertions that NASA failed to disclose goods and services provided to Boeing.

[129] The critical assumptions are (1) that the entirety of NASA's budget consists of grants and the provision of goods and services to the U.S. civil aircraft industry and (2) that NASA confers grants, goods, and services on Boeing in proportion to its share of the U.S. civil aircraft industry. Exhibit EC-18, p. 1, Exhibit EC-25, pp. 9-12 and 15-18 (treating entire NASA program budget as "funding" of producers of civil aircraft and parts or engines and parts). Another assumptionis that the share of spending under various programs related to excluded research topics or contractors can be determined by the number of project in the program or number of primary contractors. Exhibit EC-25, pp. 8, 10, 11, and 16.

research contracts. The United States does not ask the Panel to make any assumptions in this calculation.

342. *How does the United States respond to the following assertion of the European Communities:*

> *"A subjective review of records and databases by the responding Member in a dispute under Part III of the SCM Agreement, without providing access to the records and databases that were reviewed (or, at a minimum, submitting the results of the review) does not satisfy a responding Member's burden to rebut the complaining member's prima facie case. The European Communities and the Panel have no way of knowing precisely what inquiries NASA conducted into its records and databases, which themselves are known to be unreliable. In fact, the US admission that it missed certain NASA contracts in its analysis confirms that NASA's review of its records and databases was haphazard and incomplete." (EC Comments on US RPQ 182, para. 184).*

In this regard, please explain on what basis the Panel can make a finding, in accordance with the requirements of Article 11 of the DSU, that there is a proper basis in the evidence before the Panel for the statements in paragraphs 217-219 of US RPQ 188 if the Panel does not have access to the "records and databases" referred to by the European Communities?

103. The United States will first provide the explanation requested by the Panel, and then respond to the EC assertions.

Paragraphs 217-219 of US RPQ188 provide a proper basis in the evidence for a finding

104. Article 11 calls on the Panel to "make an objective assessment of the matter before it, including an objective assessment of the facts of the case . . . ." In *Brazil – Tyres*, the Appellate Body found that "{t}his assessment implies, among other things, that a panel must consider all the evidence presented to it, assess its credibility, determine its weight, and ensure that its factual findings have a proper basis in that evidence."[130] In determining whether evidence provides a "proper basis" for a finding, the Panel will also have to consider the burden of proof associated with that finding. As the Appellate Body explained in *US – Shirts and Blouses*:

> the burden of proof rests upon the party, whether complaining or defending, who asserts the affirmative of a particular claim or defence. If the party adduces evidence sufficient to raise a presumption that what is claimed is true, the burden

[130] *Brazil – Tyres (AB)*, para. 184.

> then shifts to the other party, who will fail unless it adduces sufficient evidence to rebut the presumption.[131]

Thus, a panel's factual finding has a "proper basis in the evidence" when the evidence in favor of the finding, in light of its weight and credibility, and considered together with the contrary evidence either creates a presumption that a fact asserted by a party is true, or rebuts such a presumption.

105. The passage cited by the Panel discusses how to measure the magnitude of the NASA research contracts with Boeing that the EC alleges to be a financial contribution within the meaning of Article 1.1(a)(1)(i). As the party asserting that these payments constitute a financial contribution that confers a benefit and, by reason of their magnitude cause adverse effects, the EC bears the burden of proof with respect to the magnitude of the alleged subsidy. The EC has attempted to avoid this burden by grouping together several different alleged financial contributions conferred through different mechanisms. However, as the United States has explained, the EC methodology of ascribing an aggregate value to the alleged financial contributions is inconsistent with the EC's obligation to address each alleged financial contribution individually.[132] It lacks any basis in the evidence, and the methodology relies on unsupported assumptions and data that includes expenditures that the EC itself concedes should be excluded.[133] Thus, the simplest answer to the Panel's question is that, as the EC has failed to meet its burden of proof, there is no need to consider the U.S. rebuttal.

106. The more detailed answer is that the statements in paragraphs 217 through 219 of US RPQ 188, together with other evidence identified by the United States, provide a proper basis in the evidence for finding that disbursements to Boeing under *all* contracts with the four NASA aeronautics centers were $1.05 billion in the 1989-2006 period.[134] This figure includes contracts for research exclusively related to the excluded topics of engines, air traffic management, and hypersonic flight.[135] The description of the verification process in US RPQ 188 recounts that when NASA subtracted the value of those contracts for excluded research, it demonstrated that the maximum value of research subject to EC claims was $775 million.[136]

107. Paragraphs 217 through 219 describe the first steps taken by NASA officials, in response to Panel Question 188, to verify the total value of NASA's contracts with Boeing under the programs challenged by the EC. Specifically, NASA identified all contracts awarded to Boeing

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[131] *US – Shirts and Blouses (AB)*, p. 14.

[132] US Comments on EC RPQ 156, paras. 207-212.

[133] US RPQ 176, paras. 164-173.

[134] US FWS, para. 212.

[135] The U.S. response to Question 336(b) identifies some of these.

[136] US RPQ 188, para. 223. The U.S. responses to Questions 336(v) and 341 address this issue in greater detail.

in the 1989-2006 period, verified the accuracy of that list by comparison to reliable published data on the total value of NASA's funding to Boeing, determined which of those contracts were awarded by the four NASA aeronautics centers, and added together all disbursements under these contracts to derive a total of $1.05 billion for all contracts with aeronautics centers.

108. The proper basis in the evidence for this process and the conclusion appears in those paragraphs and supporting evidence. To begin, the description of the steps taken by NASA is itself evidence that the officials actually performed the actions described – they queried NASA databases to identify all contracts awarded to Boeing, compared the results with data from the NASA Annual Procurement Reports to ensure that the set was complete, and removed contracts awarded by centers that perform no aeronautics research. The United States notes that the EC has never disputed that NASA officials took these steps and there is, in fact, no evidence to the contrary. Thus, this description of the process used by NASA is undisputed. The Panel can, therefore, be confident of these facts without access to the "records and databases" referenced by the EC.

109. Another undisputed fact is that the U.S. Government relies on the NASA Annual Procurement Report figures as an accurate measure of the total value of funds allotted to NASA's contracts each year, and uses those data to compile its government-wide contracting figures.[137] The EC itself put forward the Annual Procurement Report data, without qualification, as evidence of U.S. government payments to Boeing and other contractors, indicating that the EC considers them reliable.[138] Thus, the figures in those reports present a proper basis in the evidence for total funds allotted to all Boeing contracts in any given year and over the 1989-2006 period. The Panel need not have access to the "records and databases" to be confident of these facts.

110. It is also undisputed that Exhibit US-1301 shows that the value of funds allotted to contracts identified in NASA's query of the FPDS and FPDS-NG matches the value of the funds reported in NASA's Annual Procurement Reports for all contracts with Boeing each year from 1989 to 2006. The EC itself recognizes that NASA officials correctly summarized and compiled this data.[139] The undisputed close match between the value of contracts in NASA's query with the value of disbursements in the Annual Procurement Reports provides a proper basis to find that the set of contracts identified by NASA in its verification exercise is substantially identical to the set that produced the figures in the NASA Annual Procurement Reports. The Panel need not have access to the "records and databases" to be confident of these facts.

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[137] US RPQ 7, para. 12.

[138] The EC submitted 14 years of NASA's Annual Procurement Reports as Exhibit EC-341. These data form the basis for Exhibit EC-19, which the cited extensively in its first written submission. EC FWS, notes 833, 888, 931, 964, 992, 1026, 1046, 1077, 1508, and 1579.

[139] EC Comments on US RPQ 188, para. 207

111. This evidence by itself provides a proper basis to find that the set of contracts identified in NASA's query represents all contracts awarded by NASA to Boeing during the 1989-2006 period. In other words, it is "complete." Access to the "records and databases" referenced by the EC is unnecessary to reach or substantiate this conclusion.

112. The final step in this process was for NASA to identify which contracts in the set were awarded by NASA centers that conduct no aeronautics research. The United States has submitted evidence that Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center, Marshall Space Flight Center, and Stennis Space Center perform no aeronautics research.[140] Conversely, the centers that performed at least some aeronautics research were Langley Research Center, Glenn Research Center (formerly known as Lewis), Ames Research Center, and Dryden Flight Research Center. FPDS and FPDS-NG clearly identify the center that issued a contract.[141] Therefore, excluding contracts awarded by the non-aeronautics centers was a simple clerical task.[142] The EC has expressed confidence in NASA's ability to perform such tasks. The undisputed fact that NASA undertook a process to exclude contracts awarded by non-aeronautics centers, and the fact that such contracts are readily identifiable in the databases provides a proper basis for concluding that NASA correctly identified and removed contracts from the four aeronautics centers. Access to the "records and databases" referenced by the EC is not necessary to reach this conclusion.

113. Finally, with regard to the other factors listed in *Brazil – Tyres*, the Panel should find that this evidence has a high degree of credibility, and warrants a great deal of weight. NASA officials have responded candidly and thoroughly to the Panel's questions throughout this proceeding. They have attended Panel meetings to provide direct assistance to the Panel. They have checked their submissions for mistakes, and corrected those mistakes when discovered. In addition, they have a great deal of experience working with the databases in question, and familiarity with the work of the NASA centers that conduct aeronautics research. Therefore, the materials submitted by NASA officials to the Panel have a high degree of credibility. The Panel should also give this evidence great weight. It directly addresses, without recourse to assumptions or estimates, two factual issues critical to an evaluation of the EC's claims: the value ($1.05 billion) of *all* Boeing contracts funded by the four NASA aeronautics centers, and the identity and maximum possible value of contracts for research challenged by the EC.

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[140] Description of NASA Space Flight and Space Centers (Exhibit US-1303).

[141] In fact, the identity of the awarding center is built into the contract number. For most of the period, the number at the beginning of a contract numbers indicated the issuing center, with "1" issued by Langley, "2" issued by Ames, "3" issued by Glenn, "4" issued by Dryden, etc. When NASA moved to the FPDS-NG, it adopted a new convention that reflected the center with an alphabetic code, with NNL being the code for Langley. *E.g.*, Contract NNL04AA29C (Exhibit US-490 (HSBI)).

[142] NASA's process is functionally indistinguishable from a computer query requesting a list of contracts awarded by the four centers that perform aeronautics research.

114. Thus, the undisputed facts and evidence before the Panel provide a proper basis to conclude that NASA's query identified all contracts awarded to Boeing in the 1989-2006 period, and that NASA correctly identified and excluded contracts awarded by centers that perform no aeronautics research. These conclusions then support the further conclusion that the remaining contracts, which resulted in disbursements of $1.05 billion, are the only ones issued by centers that performed aeronautics research and, therefore, represent the maximum value of contracts awarded under the programs challenged by the EC. In fact, some of the contracts included in this subset should also be excluded, but that is a matter covered elsewhere.

Response to the EC's assertions

115. The United States will separately address each of the assertions in the paragraph quoted by the Panel.

> *The EC assertion that "{a} subjective review of records and databases by the responding Member in a dispute under Part III of the SCM Agreement, without providing access to the records and databases that were reviewed (or, at a minimum, submitting the results of the review) does not satisfy a responding Member's burden to rebut the complaining member's* prima facie *case."*

116. Contrary to the EC's view, the responding Member's burden to rebut depends first on the case made by the complaining Member. If that Member fails to make a *prima facie* case, as the EC has in this dispute, the responding Member has no burden. If the complaining Member makes only a weak *prima facie* case, the responding Member's task is correspondingly easier.

117. Thus, the question before the Panel is not whether, as an abstract rule, a panel can rely on the output of a government database without having access to the database itself or the underlying records. Panels frequently rely on data compiled by government without reviewing source data. The questions are the credibility of the rebuttal evidence submitted by the United States and the weight to which it is entitled, in light of the entirety of the evidence. The Appellate Body has instructed panels that they have discretion in how they approach these questions:

> Article 11 of the DSU deals with the function of panels and assigns to them certain duties, *inter alia*, to "make an objective assessment of the matter before it, including an objective assessment of the facts of the case and the applicability of and conformity with the relevant covered agreements". The Appellate Body has considered these duties on many occasions, and has consistently recognized that Article 11 affords panels a margin of discretion in their assessment of the facts. This margin includes the discretion to identify which evidence the panel considers

> most relevant in making its findings, and to determine how much weight to attach to the various items of evidence placed before it by the parties to the case.[143]

118. For the reasons set out in response to this question and questions 341 and 342, the U.S. evidence as to the identity of Boeing contracts subject to the EC claims and their value is credible and entitled to great weight. Therefore, it meets any burden of rebuttal placed on the United States by the EC's unsuccessful efforts to make a *prima facie* case regarding the value of the challenged NASA payments to Boeing.

119. The United States also notes that this EC allegation contains several factual errors. As the United States explains in US RPQ 341(c), NASA's review of its records and databases was objective, in that it rested on observable facts as to which center awarded each contract and the subject matter of the contracts awarded by centers that conducted aeronautics research. The Panel also has access to underlying records in the form of the contracts submitted by the United States and the EC. And finally, the United States did submit the results of its review in the form of the contracts themselves and many data tables incorporating the output of NASA's databases.

> *The EC assertion that "{t}he European Communities and the Panel have no way of knowing precisely what inquiries NASA conducted into its records and databases, which themselves are known to be unreliable."*

120. This statement is simply untrue. Paragraphs 217-218 of US RPQ 188 describe precisely the query input into the FPDS and FPDS-NG – identify "all contracts with Boeing and Boeing subsidiaries in the Top 100 Contractors list." Paragraph 159 of US RPQ 175 describes in general terms the query NASA used to develop a list of contracts with all contractors for aeronautics research. It also indicates that NASA officials spot checked the results to ensure accuracy.

121. As to the assertion that NASA databases are "unreliable," the only support the EC provides is a citation to its general criticism of the FPDS and FPDS-NG. The United States showed in its RPQ 341(d) that the GAO report cited by the EC does not contain any findings that cast doubt on the reliability of *NASA's* data in the FPDS and FPDS-NG systems. Indeed, the findings focus on the FPDS-*NG*, which NASA used only for 2005-2006, the two years with the lowest value of contracts during the 1989-2006 period.[144] Thus, the EC has provided no basis for a conclusion that NASA's databases are "unreliable" for the purposes of identifying and valuing research contracts in this dispute.

> *The EC assertion that "the US admission that it missed certain NASA contracts in its analysis confirms that NASA's review of its records and databases was haphazard and incomplete."*

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[143] **Error! Main Document Only.***Chile – Price Band System (21.5) (AB)*, para. 229 (citations omitted).

[144] Exhibit US-1301.

122. The opposite is true. The evidence shows that, faced with the need to identify contracts related to programs in some cases more than 15 years old, NASA made a good faith and comprehensive effort to review electronic and physical records. The initial effort demonstrates that NASA did not seek to improperly exclude contracts, as it mistakenly included some contracts and mistakenly excluded others. Moreover, NASA's effort to double check its work and correct the errors discovered serves to confirm NASA's credibility.

123. More importantly, the verification exercise conducted for US RPQ 188 demonstrates that any errors were not material. It shows that a top-down approach that resolves all disputed facts in favor of the EC results in a maximum value of $775 million for 1989-2006, far smaller than the EC's total alleged subsidy value of $10.4 billion for that period.[145] The verification exercise also shows that the contracts submitted by the United States as a result of its initial exercise cover the large majority of contracts that are even potentially related to the EC claims. Thus, that initial exercise was neither haphazard nor incomplete.

343. In its First Written Submission, the United States observes:

> *"The EC's calculation rests of flawed assumptions, including: (1) an overstatement of the amount of NASA aeronautics R&D that is even potentially applicable to production and development of large civil aircraft – as opposed to rotorcraft, general aviation, supersonic and hypersonic aircraft, unmanned vehicles and air traffic management systems; (2) an understatement of the amount of engine-related R&D, which the EC concedes is not a benefit to Boeing; (3) a failure to recognize that, like engine-related research, research directed to other large civil aircraft components produced by U.S. suppliers, and available to both Boeing and Airbus, should be excluded, including aero structures, avionics, and landing gear; and (4) an understatement of the wide range of non-LCA manufacturers that participate in and benefit from the NASA-funded R&D." (US First Written Submission, para. 195.)*

The Panel notes the United States' response to Panel Question 176. Please quantify, wherever possible, the extent to which each of the alleged errors in the European Communities' estimate, discussed in paras. 164 – 172 of US RPQ 176 and in Exhibit US-1272, affects the accuracy of the calculations in Exhibit EC-25, and explain the source of, or methodology used to derive, such amounts.

124. To begin, the US recalls that the objective of the calculation proposed by the EC in exhibit EC-25 is to estimate the value of the "total support" that it alleges NASA provides to LCA manufacturers – in its own words, the "value of direct transfers of funds and provision of goods and services."[146] The United States has put forth a direct measurement of this "total

[145] US RPQ 188, paras. 223-225; *compare* Exhibit US-1305 *with* Exhibit EC-25 p. 1.

[146] EC Comments on US Response to PQ 177, para 172.

support", as defined by the EC, based on NASA's actual transactions with Boeing. Specifically, it identified all of the contracts and Space Act Agreements between NASA and Boeing related to large civil aircraft, and summed up the value of the disbursements under the contracts and the goods and services provided under Space Act Agreements sponsored by the NASA programs covered by the EC claims. This calculation is supported with evidence, amplified with explanations, and verified against the public records. The verified results are at most $775 million in disbursements from 1989 to 2006[147] under contracts and $75 million in the value of unreimbursed goods and services provided under Space Act Agreements – $850 million in "total support".[148] Thus, to the extent that the panel finds (contrary to the view of the United States) that either element of this "total support" constitutes a subsidy within the meaning of Art. 1, this approach is a reliable means of valuing the magnitude of any financial contribution.

125. The EC's valuation methodology, by contrast, relies on a series of assumptions that have no support in evidence to attribute a huge share of NASA's total aeronautics research spending to Boeing. Most glaringly, it attributes to Boeing (1) funds that NASA paid for research performed by other entities, all of which have interests that differ from Boeing's, and many of which supply Airbus; and (2) funds that NASA paid to acquire facilities, equipment and personnel for its own use. And it attributes those funds to Boeing in a proportion that assumes NASA's activities are useful only to U.S. manufacturers of civil aircraft and parts. The EC's methodology may be reflective of its rhetoric that everything NASA does is on behalf of Boeing, but it ignores the substantial evidence demonstrating otherwise.

126. NASA's budget documents do not permit all of the adjustments that would have to be made to "correct" the enumerated flaws in Exhibit EC-25. However, by making certain basic adjustments to reflect these most glaring errors, it becomes immediately evident that a full correction of the EC's "top-down" valuation methodology would produce a number close to the U.S.'s more reliable (and more straightforward) summing up of the actual values of LCA-related contracts and SAAs between NASA and Boeing.

127. *The first two enumerated flaws* – which relate to the EC's failure to exclude the full amount of research that is related to substantive topics that it has conceded are not part of its challenge – cannot be precisely quantified. Indeed, the EC's errors on this point are the result of the conceptual problem that it is not possible to isolate funding for NASA's "non-engine civil aeronautics" based on budget documents. That is because NASA rarely compartmentalizes its research budget into neat propulsion, airframe, air traffic, and hypersonic research lines. In accordance with its mission of building the base of aeronautics knowledge, NASA frames its aeronautics research programs in broad terms that cover many topics. For example, the AST

[147] US RPQ 188 and Exhibit US-1305. The U.S. response to Questions 336(v) and 340 discussion this issue in further detail.

[148] US RPQ 175, para. 160 and Exhibit US-1256(revised). The U.S. responses to Questions 352 and 353 provide further information.

Program budget described 13 areas of inquiry.[149] It does not, however, publish individual budget lines for each of these areas of inquiry. Thus, while two of these areas plainly cover excluded topics, the EC could not determine from the budget how much each received and thus could not calculate the proper amount to exclude from its calculations.

128. The generality of NASA's research budget descriptions goes deeper than the program level. It is similarly difficult to align funding to research topics at the level of areas of inquiry within individual program budgets. Thus, while the EC assumed that certain subtopics under AST were 100 percent related to large civil aircraft (as opposed to engine or air traffic), the evidence demonstrates that the assumption is a mistake.

129. To take one example, the EC assumed, on the basis of a seemingly indeterminate title, that 100 percent of the activity under "terminal area productivity," related to large civil aircraft. The materials cited by the EC, however, demonstrate that this area of research was undertaken with the objective "to reduce spacing requirements while maintaining safety, enhance terminal air traffic management, improve low-visibility landing and surface operations, and integrate aircraft and air traffic systems."[150] That is, the research covered only air traffic management, yet the EC did not exclude any amount of funding on this basis,[151] and, if it had attempted exclusion, could not have derived actual values for the research from the budget materials. Similarly, other AST subtopics areas, such as "noise reduction," "environmental assessment," "affordable design and manufacturing," and "technology integration" also are obviously related both to large civil aircraft and to engines, but the budget materials provide no basis to determine how much of the research under these topics is directed at each.[152] The budget documents for the R&T Base Program make clear that much research that the EC concedes should be excluded, for example, related to propulsion, air traffic management, and hypersonic flight, occurs in areas with generic-seeming titles that suggest no particular link to those subjects. For example, efforts entitled "Materials and Structures and Technology" or "Aero-Space Vehicle System Technology" included research into propulsion, air traffic management, and safety. Exhibit US-1272 provides numerous similar examples.

130. This evidence demonstrates that is not possible, working top down from budget documents, to thoroughly identify, measure, and exclude the research that the EC concedes should be excluded. It is for this reason that NASA officials reviewed the detailed project descriptions contained in individual contracts in order to determine the actual amount of "non-engine LCA-related research that Boeing performed for the four NASA aeronautics centers. NASA's methodology for compiling data on spending under its contracts with Boeing is the only way to avoid the errors inherent in the EC's approach.

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[149] AST Budget Estimates, FY 1996, pp. SAT 4-35 – SAT 4-38 (Exhibit EC-357).

[150] NASA AST Budge Estimates, FY 1996, p. SAT 4-36 (Exhibit EC-357).

[151] Exhibit EC-25, p. 11, note 2, *citing* NASA AST Budge Estimates, FY 1996, p. SAT 4-36.

[152] The U.S. response to Question 344 discusses these problems in greater detail.

131. *The third enumerated flaw* – which relates to the EC's failure to exclude a large amount of NASA's budget that is disbursed to entities other than Boeing – can be quantified. The United States has demonstrated that $6.7 billion of the "value" was in fact money paid by NASA to other contractors for research work.[153] NASA transacts with these entities under the same regulations that apply to its contracts with Boeing. There is, therefore, no basis to assume (as the EC does) that transactions with Boeing are "direct transfers of funds" to Boeing, while transactions with these other enterprises are purchases from them for the benefit of Boeing. There is also no basis to treat NASA personnel as related almost exclusively to the transactions with Boeing.

132. The U.S. has taken note of the EC argument that

> to the extent *some* of this $6.58 billion … was spent by NASA internally in order to provide goods and services to Boeing or to the extent some of this amount was spent by NASA externally to acquire goods and services from entities other than Boeing and then provide those goods and service to Boeing's LCA division, *all* of it is properly included in the amount of the subsidy to Boeing's LCA division.[154]

There is no basis in the evidence for doing so. As the United States has demonstrated, NASA's only provisions of goods and services within the meaning of Article 1.1(a)(1)(iii) are done, and accounted for, under Space Act Agreements.[155] The EC originally appeared to recognize this fact, as it focused in its first submission solely on provisions made in the context of Space Act Agreements.[156] The total value to Boeing of those provisions sponsored by the programs challenged by the EC is $75 million.[157] These $75 million in facilities, equipment and employee costs are accounted for in the NASA Research and Program Management Budget and the portions of the program budgets that relate to acquisition of items other than research and,

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[153] US RPQ 175, para. 159 ($7,446 million total contracts for aeronautics research, minus $775 million in contracts with Boeing).

[154] EC Comments on US RPQ 177, para. 172 (emphasis added)

[155] US FWS, paras 230 *et seq.*

[156] EC FWS, paras. 891-893. The EC's only specific allegation regarding provisions of goods and services under contracts relates to a "stitching machine" that NASA acquired for use by Boeing in performance of contract NAS 1-20546. The evidence demonstrates that this item had a value of $9 million, and that NASA also made available another $2 million in other government-furnished property, as listed in the contract. See US RPQ 152 and *List of Government-furnished property under Contract NAS1-20546* (Exhibit US-1334). The United States also recalls that the stitching machine was ultimately sold for scrap at the end of the contract because it had no further utility outside of the research done for NASA under the contract. See US FWS, para. 231, n. 333. Even if the Panel were to consider that the acquisition of this equipment constitutes a provision of goods and services that confers a benefit on Boeing, and therefore must be included in the valuation of "total support", it is an acquisition of equipment, and therefore is not included in the $6.58 billion disbursed to other entities under the program budgets to perform research. The U.S. response to Question 336(iii) discusses this issue in greater detail.

[157] Exhibit US-1256(revised).

therefore, are not included in the $6.7 billion of funding disbursed to other entities from the program budgets to do research.

133. In sum, the only basis for allocating to Boeing the $6.7 billion in research funding that NASA disburses to entities unrelated to Boeing is on the theory that the general availability of the results of that research constitutes a financial contribution to manufacturers of a certain type of aircraft. As the US has explained in response to Q322, any claim with regard to government-funded foundational research made generally available constitutes a provision of general infrastructure, and therefore is not a financial contribution within the meaning of Article 1.1(a)(1)(iii) of the SCM Agreement.

134. Finally, *the fourth enumerated flaw* – which relates to the EC's failure to recognize that many entities outside the civil aircraft industry participate in NASA research and use the results – is best addressed by basing the analysis on NASA's actual transactions with Boeing. As discussed above, there is no basis under the SCM Agreement for attributing to Boeing any portion of the NASA budget that does not constitute something provided to it – specifically, the $775 million in funds disbursed to Boeing under contracts or the $75 million in goods and services provided to Boeing under Space Act Agreements.

135. If the Panel decides to attribute other parts of NASA's budgets to Boeing, the only reasonable approach is the one outlined in the U.S. response to Question 352, which follows standard accounting methodology by allocating expenses in proportion to the activities to which they relate. In this case, Boeing represents 10.4 percent of total NASA aeronautics research contracting and, thus, if the Panel decides to allocate a percentage of NASA's indirect costs to it, that percentage should be no more than 10.4 percent.[158]

136. If the Panel chooses to reject this "cure" in favor of an adjustment of the EC's constructed allocation ratio, it would have to take account of the fact that NASA does its business with (and thus its costs should be allocated to) the full group of entities that participate in its programs and benefit from its R&D. This group includes civil and military aircraft manufacturers, suppliers to both, airlines, and universities, as well as companies from a variety of other industries, including automotive, maritime and energy.[159]

137. The breadth of this group reflects NASA's statutory objectives to achieve "{t}he expansion of human knowledge of the earth and of phenomena in the atmosphere and space" and

[158] US RPQ 175, para. 155 and Exhibit US-1271.

[159] US FWS, para 193, 205-211. The EC proposes to allocate NASA's budget wholly to the U.S. civil aeronautics industry (and, in fact, wholly to civil aircraft manufacturers) based on (1) the "purpose" of NASA research as expressed in the agency's authorizing legislation, statements of officials, and in program materials; (2) NASA payments to members of that industry to perform research; (3) participation by members of the industry in NASA advisory groups; (4) use of NASA facilities by that industry; and (5) use of NASA-developed knowledge in the industry's products. The evidence shows that an honest application of this methodology would include a group of entities much broader than civil aircraft manufacturers.

"{t}he usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles" and "making available to agencies directly concerned with national defense of discoveries that have military value or significance." [160] These goals implicate, at minimum, the entire aviation industry – both civil and military aircraft producers, the suppliers of both, and the airlines that fly their aircraft. As a result, a broad group of enterprises and spokespersons participate in advising NASA on its research agenda.[161] And, accordingly, the areas of NASA's research extend into supersonic and hypersonic flight technologies which only apply to high-speed military aircraft.[162] Other NASA research relates primarily to the airlines operating the aircraft, rather than the producers who make them: air traffic management, fault detection and air safety equipment, and efficient aircraft operation techniques that minimize fuel consumption, noise, and pollution.[163] Moreover, in light of its broad research agenda, NASA awards research contracts and makes its facilities available to producers of both civil and military aircraft and the full range of their suppliers, the airlines that fly their aircraft, as well as companies with no particular affiliation to the aviation industry and every major research university.[164]

138. To reflect the broad applicability of NASA's research in a "top-down" approach, it is necessary to allocate the value of that research across the full range of the participants in and users of that research. To do this, the United States looked first to data compiled by the U.S. Bureau of the Census, the source that formed the basis for the American Institute of Aeronautics and Astronautics ("AIAA") on which the EC based its calculation.[165] A full series of Census

[160] Space Act, § 102(d)(1) and (2) (Exhibit EC-268).

[161] See US FWS, para. 190-191.

[162] NASA's legislation envisages the possibility of military application, and one of its objectives is "making available to agencies directly concerned with national defense of discoveries that have military value or significance." Space Act, § 102(d)(6). The Space Act further envisages that NASA will cover general aeronautics and space research, while DoD will be responsible for and direct "activities peculiar to or primarily associated with the development of weapons systems, military operations, or the defense of the United States (including the research and development necessary to make effective provision for the defense of the United States)." Space Act, § 102(b) (Exhibit EC-268). This statutory division of labor provides another example of why civil research may be applicable to military uses, while the reverse is rarely true. NASA focuses on foundational research with broad applicability, while DoD specializes on topics of little use in the civil sector – weapons systems, military operations, and defense.

[163] US SNCOS, para. 41.

[164] See, e.g., US FWS, para. 193, 205-210

[165] The EC used data compiled by the AIAA as its value for sales by the U.S. industry producing non-military aircraft and parts. Exhibit EC-18. AIAA, in turn, based its figures on annual U.S. Census Bureau data for "Aerospace Industry (Orders, Sales, and Backlog). Exhibit EC-18, p. 1, note 2 *citing Aerospace Facts and Figures 2004/2005* and *Aerospace Facts and Figures 2005/2006* (Exhibit EC-49). Those documents, in turn, cite the Bureau of the Census's *Aerospace Industry (Orders, Sales, and Backlog)* Report. *Aerospace Facts and Figures 2005/2006*, p. 26, source line (Exhibit EC-49). The Census Bureau report *Civil Aircraft and Aircraft Engines; and Aerospace Industry* contains a table labeled "Value of Net New Orders, Net Sales, and Backlog of Orders of Complete Aircraft, Space Vehicles, Missiles, and *Selected* Parts," which matches the AIAA data. *E.g.*, U.S. Census Bureau, *Civil Aircraft and Aircraft Engines; and Aerospace Industry: 2005*, p. 1 (emphasis added) (Exhibit US-1345). The value reported for complete aircraft and parts, nonmilitary is $28,275 million, which also appears in the AIAA data

Bureau data was not available for air transportation for one component of this calculation, so the United States relied on other sources.

139. Specifically, the U.S. Census Bureau data provide values for total annual shipments of U.S. manufacturers of aircraft, aircraft engine and engine parts, and aircraft parts and auxiliary equipment.[166] (Inclusion of engines and parts is necessary because any NASA budget not directly related to research would as likely be related to engine research as to any other topic.)[167] The U.S. Census Bureau does not publish annual data on air transportation revenues that is comparable across the period. Therefore, the United States used data published by the Air Transport Association on revenues of U.S. carriers providing scheduled and unscheduled transportation of passengers and cargo.[168] Exhibit US-1353 provides these data and a reconstructed ratio based on these data. That recalculation shows that Boeing represented at most 12.8 percent, on average, of the industries that participated in NASA activities and that used NASA research in the 1989-2005 period. If NASA's budget is to be allocated proportionately to industries, any rational allocation would have to include at least these industries. The United States emphasizes that this is an exceedingly conservative estimate, as it understates the full range of industries that participate in NASA activities, and thus overstates Boeing's percentage of the total. The 2002 Census Industry Report on Aircraft Manufacturing makes clear that the range of suppliers to aircraft manufacturers also includes producers of

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(Exhibit EC-49) and the EC's "Boeing/MD LCA Allocation Charts" (Exhibit EC-18) on page 1. The data from the allocation chart factors into the figures calculated in Exhibit EC-25.

[166] Although the EC says that it has included "civil aircraft parts", the Census source data used by AIAA in fact reported only "complete aircraft and *selected* parts. Thus, the AIAA data do not include all parts, and are not a reliable indication even of the value of civil aircraft and parts produced in the United States. Census Bureau, *Civil Aircraft and Aircraft Engines; and Aerospace Industry: 2005*, p. 1 (emphasis added) (Exhibit US-1345).

[167] The relevant Census Bureau data appear in Exhibits US-1345, US-1347, US-1348, US-1349, and US-1350. For 1989-1996, they derived from published reports of data from the Census Bureau's Annual Survey of Manufactures under Standard Industrial Classification headings 3721, (Aircraft); 3724 (Aircraft Engines and Engine Parts), and 3728 (Aircraft Parts and Auxiliary Equipment, NEC) (Exhibit US-1345). In 1997, the U.S. Census Bureau switched to the North American Industrial Classification System. Data for 1997-2002 derived from the published reports of the U.S. Economic Census for NAICS headings 336411 (Aircraft Manufacturing), 336412 (Aircraft Engines and Engine Parts Manufacturing), and 336413 (Other Aircraft Parts and Auxiliary Equipment Manufacturing) (Exhibits US-1347, US-1348, and US-1349). Data for 2003-2006 derived from the U.S. Census Bureau's on-line database of results of the Annual Survey of Manufactures for those same NAICS headings. In aggregate, the coverage of SIC headings 3721, 3724, and 3728 corresponds precisely to the coverage, in aggregate, of NAICS headings 336411, 336412, and 336413. 2002 NAICS Matched to 1987 SIC Manufacturing, part (NAICS 336-339) (Exhibit US-1351).

For 2003-2006, they come from the U.S. Census Bureau on-line database of the results of its Annual Survey of Manufactures. For 1997-2002, they reflect data published as part of the U.S. Census Bureau's 2002 Economic Census. For prior years, the data reflect the published results of the Annual Survey of Manufactures based on SIC codes.

[168] Air Transport Association, Annual Earnings: U.S. Passenger and Cargo Airlines (Exhibit US-1351). The Air Transport Association derived its figures from a database maintained by the U.S. Department of Transportation's Bureau of Transportation Statistics. Exhibit US-1351 also contains this supporting data.

aircraft seats, avionics (including radio communications equipment, navigational systems, radar, sonar, and other electronic communications systems, and displays), hydraulic and pneumatic assemblies and parts, tooling and materials (including basic and advanced metals and alloys and, as the EC has stressed, composites).[169]

140. The United States emphasizes that recalculation is unnecessary in light of the evidence that allows a direct calculation of the "total" funds, goods and services provided to Boeing. However, but provides further confirmation that the small number reached through the direct calculation is in line with Boeing's relative position as one of many who participate in NASA activities and use the results of those activities.

344. The United States argues (US Comments on EC RPQ 164, para. 259) that the European Communities' methodology for removing engine-related research from the HSR, AST, QAT and VSP programmes based on the number of stated research topics related to engines, is highly imprecise. Please submit the United States' own estimates of the proportion of each of the above-referenced programme budgets that represent engine-related research, and explain the source of, or methodology used to derive, such estimates.

141. Before embarking on a detailed answer to the Panel, it is useful to remember the critical differences between the methodologies proposed by the EC and the United States. The EC proposes what it calls a "top-down" methodology that seeks to identify and value financial contributions and benefits to Boeing based primarily on data from NASA's budgets. It then seeks to use a series of assumptions to support the assertions that (1) NASA's aeronautics activities relate exclusively to U.S. producers of civil aircraft and engines, and (2) accordingly, all of NASA's budget must constitute some form of financial contribution and benefit limited to that industry. There is no support for either proposition. It is noteworthy that, in formulating its arguments in this way, the EC attempts to evade its burden of proof to show particular financial contributions and benefits associated with them.

142. The United States, in contrast, has put forward evidence of the nature of NASA's actual transactions with Boeing, the payments involved, the way in which a contractor may use agency facilities and equipment to fulfill a contract, and the way in which NASA employees manage contracts and perform their other government duties. The EC attempts to characterize this evidence as a "bottom up" approach. In fact, the evidence on which the United States relates to all levels of NASA's activities, from individual contracts to the operations of NASA's programs and research centers to the agency's overall mission. All of this evidence affirms the conclusions that NASA's payments to Boeing, and any facilities, equipment, and employees related to those transactions (1) are not financial contributions, (2) confer no benefit, or (3) both. This evidence further shows that the value of such transactions is less than one-tenth of what the EC alleges.

[169] U.S. Bureau of the Census, Aircraft Manufacturing: 2002, Industry Series, Table 7 (Exhibit US-77)

143. This question addresses one flaw with the EC's "top-down" approach – the failure to subtract all of the funding for research that, as even the EC admits, confers no benefit to Boeing's production of large civil aircraft. In fact, an accurate identification and valuation of such research at the "top-down" level is impossible. As described in the U.S. response to Question 343, NASA does not separate its research neatly into civil aircraft and non-civil aircraft research, and its published budgets do not contain data to value or accurately estimate the values of either. That is one of the reasons that the United States focused on the NASA contracts and SAAs – the actual evidence of the agency's relationship with Boeing – in making its estimates. Moreover, if the Panel feels constrained to take a "top down" view, the approach laid out by the United States in its response to Question 343, which accounts for a greater breadth of the users of NASA research, is superior to the EC approach.

144. The response to this question is, in the U.S. view, a contingent rebuttal, relevant only if the Panel decides to accept the EC approach, while trying to correct the many obvious errors. The question specifically addresses only engine-related research. The AST Program and VSP also contained other areas of excluded research that the EC neglected to subtract. In the interest of greatest clarity, the following paragraphs address these other areas, too.

145. **HSR:** The HSR Program Plan submitted by the EC reports an expected budget of $1.765 billion for the 1990-2002 period, with $866.1 million for propulsion research, $733.3 for airframe, and $165.7 for system integration.[170] As integrating technology into a "system" would apply equally to all aspects of the effort, the United States suggests that a "top-down" approach would allocate those expenses equally over propulsion and airframe. That would result in totals of $813.3 million in airframe research and $951.8 million in propulsion research.[171] This calculation indicates that 54.2 percent of the HSR budget covered propulsion research, and only 45.8 percent (as opposed to the EC's 66.6 percent) related to non-engine aeronautics.

146. **AST:** Any estimate would have to begin by identifying research areas that could include the excluded topics – propulsion, air traffic management, and hypersonic flight.[172] The United States has noted the impossibility of any precise identification of these areas based on NASA's published budgeting materials. It is, however, relevant that even within these limitations, the EC has failed to identify properly all of the AST research it admits should be excluded.

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[170] High-Speed Research Program Plan, p. 27 (April 1998) (Exhibit EC-1208).

[171] $733.3 million airframe research + $866.1 million propulsion research = $1,599.4 total

Of that amount, airframe research represents 45.8 percent, and propulsion research 54.2 percent.

Applying these percentages to $165.7 million in system integration results in the addition of $76 million in system integration to airframe research, for a total of $809.3 million, and the addition of 89.7 million in system integration to propulsion research, for a total of $955.8 million.

[172] AST did not involve any research into hypersonic flight.

147. The EC reports 13 areas of interest within the AST Program: fly-by-light/power-by-wire, aging aircraft, noise reduction, terminal area productivity, integrated wing design, propulsion, short haul, civil tiltrotor, technology integration, environmental assessment, composites, advanced air traffic technology, and affordable design and manufacturing.[173] Based on the titles of the areas, the EC recognized "propulsion" as covering excluded propulsion research, and advanced air traffic technology as covering excluded air traffic management research, and attempted to exclude them. However, even a cursory review of the materials cited by the EC exposes much more research that either meets the exclusion criteria or has relevance far beyond the U.S. non-engine aircraft industry:

- "Aging Aircraft" had the goal "to develop advanced technology that may be used by the U.S. airline operators and aircraft manufacturers to economically extend the life of high time airplanes in the commercial jet transport fleet." Thus, its relevance extends to airlines.[174]

- "Noise reduction" sought "to develop noise reduction technology for source noise reduction, nacelle aeroacoustics, engine/airframe integration, interior noise, and flight procedures to reduce airport community noise." "Source noise" refers to engines, while flight procedures to reduce noise are relevant only to airlines that fly the aircraft. Thus, relevance of this topic extends to engines and airlines.[175]

- "Terminal area productivity" sought in cooperation with the FAA "to develop and demonstrate airborne and ground technology and procedures to reduce spacing requirements while maintaining safety, enhance terminal air traffic management, improve low-visibility landing and surface operations, and integrate aircraft and air traffic systems.[176] These topics are relevant to users of aircraft and to air traffic control, but not to the production or development of aircraft.

- "Short Haul" dealt exclusively with "general aviation," consisting of small aircraft.[177]

- "Technology Integration" addressed aeronautics technology generally, rather than large civil aircraft alone, and would therefore include research relevant to engines, air traffic, and airlines.[178]

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[173] Exhibit EC-25.

[174] NASA AST Budget Estimates, FY 1996, p. SAT 4-36 (Exhibit EC-357).

[175] NASA AST Budget Estimates, FY 1996, p. SAT 4-36 (Exhibit EC-357).

[176] NASA AST Budget Estimates, FY 1996, p. SAT 4-36 (Exhibit EC-357).

[177] NASA AST Budget Estimates, FY 1996, p. SAT 4-37 (Exhibit EC-357).

[178] NASA AST Budget Estimates, FY 1996, p. SAT 4-37 (Exhibit EC-357).

- "Environmental assessment" aimed to study the atmospheric impact of aviation "to serve as the basis for possible cruise emissions standards to be recommended by the International Civil Aviation Organization."[179] As the research focuses on emissions, it would appear to have relevance primarily to engine research.

- "Affordable Design and Manufacturing" aimed at "generic 'building block' technologies for affordable aircraft and engine design and manufacturing processes."[180] Therefore, it includes research relevant to aircraft.

148. These descriptions, taken from pages that the EC cited, demonstrate that the terminal area productivity and environmental assessment components of the AST Program were relevant only to the excluded topics of air traffic management and engines. Even so, the EC treated those research areas as related exclusively to "non-engine aeronautics."[181] In addition, aging aircraft, noise reduction, technology integration, and affordable design and manufacturing were related both to large civil aircraft and other categories. Even so, the EC treated them as applicable to non-engine aerospace only.

149. The data provide no basis to estimate the value of research NASA conducted in the excluded topics. The EC attempts a valuation by deducting 2/13 of the AST Program budget to reflect two of 13 AST areas of interest researching excluded topics. However, as the preceding discussion shows, far more of the program dealt with excluded topics. If the EC were faithfully implementing its own methodology, it would completely exclude the terminal area productivity and environmental assessment research areas, and exclude half of aging aircraft, noise reduction, technology integration, and affordable design and development as applicable to engines. That would require exclusion of 6/13, rather than the 2/13 under the EC approach.

150. Although this calculation fixes the EC failure to adhere to its own methodology, it does not address the broader and more troubling problem – that the "top-down" approach advocated by the EC provides no confidence that it has correctly estimated payments, facilities, equipment, and employees subject to its allegations regarding the AST Program. In contrast, the U.S. disbursements-based approach distinguishes between payments to Boeing and payments to other entities and allows an estimate based on facts, rather than conjecture.

151. **QAT:** Available documents on the QAT project provide no basis for an accurate division between engine-related research and other topics. Thus, the "top-down" approach advocated by the EC provides no confidence that it has correctly estimated payments, facilities, equipment, and employees subject to allegations regarding QAT. In contrast, the U.S. disbursements-based approach distinguishes between payments to Boeing and payments to other entities and allows an estimate based on facts, rather than conjecture.

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[179] NASA AST Budget Estimates, FY 1996, p. SAT 4-37 (Exhibit EC-357).

[180] NASA AST Budget Estimates, FY 1996, p. SAT 4-38 (Exhibit EC-357).

[181] Exhibit EC-25, p. 11, note 2.

152. **VSP:** The derivation of the EC's estimate of VS funding is particularly opaque. It appears that it estimated non-engine spending for 2003 figure by removing four projects covering research clearly related to engines,[182] and adding together budgeted amounts for the four remaining projects.[183] However, two of these projects covered research that the EC admits should be excluded. Twenty First Century Aircraft Technology focused on "enabling the development of an environmentally friendly global air transportation system . . . particularly the emissions objective."[184] This emphasis on emissions reveals a clear relationship to engine research, such as the integration of engines on wings, that the EC disregarded. The Advanced Vehicle Concepts project included work on "Hyper-X" which sought "to fly the X-43A supersonic combustion ramjet-powered aircraft at its Mach 7 and 10 test points to validate hypersonic design and analysis tools . . . for space launch or military aviation applications."[185] This description signals that the research has nothing to do with large civil aircraft.

153. Once again, the materials cited by the EC offer no way to quantify and subtract all of the excluded research that the narrative descriptions reveal. The EC did not even try. Thus, the "top-down" approach advocated by the EC provides no confidence that it has correctly estimated payments, facilities, equipment, and employees subject to allegations regarding VSP. In contrast, the U.S. disbursements-based approach distinguishes between payments to Boeing and payments to other entities and allows an estimate based on facts, rather than conjecture.

345. How does the United States respond to the European Communities' response (EC SNCOS, para. 59) to the arguments made by the United States at para. 75 of its Second Written Submission and the evidence presented in Exhibit US-1137?

154. In its first written submission, the EC described the largest portion of its estimates of the value of alleged subsidies to Boeing in terms of "NASA funding of Boeing/McDonnell Douglas LCA Division" or "Funding" that was "Allocated to Boeing/MD LCA Division."[186] In line with the meaning of "fund," the United States understood these statements to mean that the EC alleged that NASA had given that amount of money to Boeing. In Exhibit US-1137, the United States demonstrated that the values ascribed by the EC to NASA "funding" of Boeing were consistently larger than NASA's total disbursements to contractors for aeronautics research.

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[182] Ultra-Efficient Engine Technology, Propulsion & Power, Low Emissions Alternative Power, and Quiet Aircraft Technology ("QAT"). Exhibit EC-25, p. 17, notes 1 and 2. The EC took funding for QAT and treated that as a separate program.

[183] The EC exhibit does not name these projects, but the source material does: 21st Century Aircraft Technology, Flight Research, Advanced Vehicle Concepts, and Breakthrough Vehicle Technologies. NASA Vehicle Systems Program FY 2005 Budget, p. ESA 16-20 (Exhibit EC-396).

[184] NASA Vehicle Systems Program FY 2003 Budget, p. SAT 4-24 (Exhibit EC-396).

[185] NASA Vehicle Systems Program FY 2003 Budget, p. SAT 4-24 (Exhibit EC-396).

[186] Exhibit EC-25, pp. 7, 8, 9, 10, 11, 12, 15, 16, 17, and 18.

155. In its oral statement at the second panel meeting, the EC revealed that what it had earlier described as "funding" of Boeing was in fact an amalgam of "not only contract disbursements to Boeing but also provisions of valuable goods and services."[187] As the EC refuses to divide its estimates of subsidy value between its allegations of direct transfers of funds to Boeing and the provision of goods and services to Boeing, a direct comparison with NASA's total spending on contracts is not possible.

346. In its First Written Submission (para. 201), the United States argues that, under the SCM Agreement, the value of the financial contribution from the provision of goods and services is limited to the value of the goods or services provided, not the full cost to the government of building and maintaining the goods or services provided (in that case, NASA's wind tunnels and personnel).

a) <u>To the United States</u>: Please elaborate on this argument, citing where appropriate to relevant WTO jurisprudence. In so doing, please explain whether there is any inconsistency between this argument and the fact that the values of NASA facilities, equipment and employees provided by NASA through Space Act Agreements listed in Exhibit US-1256 are based on Estimated Price Reports (US RPQ 183, para. 190) which appear to calculate the "full cost" to NASA of its contributions, and in this respect, appear to include allocated indirect costs and overhead (e.g., Exhibit US-109 (BCI))?

156. In paragraph 201 of the U.S. first written submission, the United States objected to the EC's attempt to ascribe to Boeing a share of the total cost of building and maintaining certain facilities equal to Boeing's share of U.S. production of civil aircraft and parts (excluding engines). As the estimated price reports referenced by the Panel and the wind tunnel regulations demonstrate, NASA does base the valuation of goods and services under Space Act Agreements on its fully allocated cost, but only with regard to the services actually provided.[188] The EC provides no support for assuming that the total cost of test facility usage – which includes usage by military aircraft producers, engine producers, or other U.S. government agencies – should be borne by Boeing.

157. In general, the basis for the conclusion that the value of a financial contribution from the provision of goods and services is limited to the "value of the goods or services provided" can be found in the Appellate Body's reasoning in the *Canada – Aircraft* dispute:

> there can be no "benefit" to the recipient unless the "financial contribution" makes the recipient "better off" than it would otherwise have been, absent that contribution. In our view, the marketplace provides an appropriate basis for comparison in determining whether a "benefit" has been "conferred", because the

[187] EC SNCOS, para. 59.

[188] US FWS, para. 248 and note 352, para. 245.

> trade-distorting potential of a "financial contribution" can be identified by determining whether the recipient has received a "financial contribution" on terms more favourable than those available to the recipient in the market.[189]

Thus, when a panel is evaluating a provision of goods or services, it compares the terms of the provision of the relevant good or service against the terms available for a comparable provision in the marketplace. The price is obviously significant in this comparison, so that a Panel will often compare a market price for the contribution against whatever fee the government charged. The government price is the value of the financial contribution, and the degree to which it is greater than the market price is the benefit.

158. Ordinarily, this analysis does not call for a consideration of the cost of the financial contribution. In evaluating provision of a good or service, the comparison between the market price and government fee would not change if, because of a market downturn, producers or suppliers were selling at below their cost. Nor would that comparison change if the market value of the good or service were less than the government cost. Indeed, the Appellate Body found that cost to government is not relevant to the evaluation of whether a measure confers a subsidy.[190]

159. The cost may, however, become relevant in some situations, such as when the market price is based on some elements of the producers' or suppliers' cost. For example, in some service industries, including research and development, the normal market practice may be for suppliers to charge the purchaser based on the cost of research time and materials consumed.[191] In other situations, when no good or service comparable to the financial contribution is available in the market, a panel might need to consider the cost of the financial contribution as a surrogate for the market price.

160. In a situation where the cost of a good or service became relevant, the panel would also need to determine what cost to consider. When the market price for a good or service is customarily determined by the supplier's costs, an evaluation of "terms available to the recipient in the market" would require a consideration of the costs that a market transaction would reimburse, and exclusion of costs that would not be reimbursed.

161. When no good or service comparable to the financial contribution is available in the market, the cost may serve as a surrogate for the market price, and the panel would need to consider exactly what the government provided to the recipient. For example, if the provision in

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[189] *Canada – Aircraft (AB)*, para. 157.

[190] *Canada – Aircraft (AB)*, para. 156 ("Canada's argument that 'cost to government' is relevant to the question of whether there is a 'benefit' to the recipient under Article 1.1(b) disregards the overall structure of Article 1.1.").

[191] *E.g.*, Contract B, p. 3 (Exhibit US-1209),

question was the use of a government-built aircraft for a week, the full cost of purchasing the aircraft would not accurately reflect "terms available in the market" for a one-week lease.

162. The point the United States sought to make, in a summary fashion, in paragraph 201 of its first written submission was that the value of wind tunnel usage by Boeing must be based on what NASA actually provided, namely, temporary use of the facilities. In contrast, the EC's calculation allocates the total cost of NASA's aeronautics research operation (which includes the full cost of operating wind tunnels) to Boeing based on its proportion of civil aircraft and parts production based on the demonstrably false assumption this reflects the benefit. That is simply incorrect, as companies outside of the civil aeronautics industry use (and fund) NASA facilities, as do government entities.[192]

163. To the extent that NASA provides these goods or services under Space Act Agreements, no allocation of costs from the agency's budget is necessary. Exhibit US-1256(revised) reports the actual value of what NASA actually provided, as reflected in agency records.[193] To the extent that NASA provides goods or services under contracts, an allocation is inappropriate because any such provision advanced NASA's goals, and provided no financial contribution or benefit to the contractor.

164. NASA's use of fully allocated costs in calculating fees for use of its wind tunnels is fully consistent with these principles for valuation because it charges only for those costs (including overhead) associated with actual usage. As is appropriate, it does not seek to charge one group of users (producers of civil aircraft and parts) the total cost including costs incurred by other users, which is the EC approach.

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351. In US RPQ 183, para. 190, the United States indicates that "{t}he value of NASA facilities, equipment and employees provided in Exhibit US-1256 was based on Estimated Price Reports contained either in the physical files related to an agreement or from NASA's TechTrackS system, which includes data on the estimated price reports for Space Act Agreements."

(a) Please provide the Panel with these Estimated Price Reports and "data on the estimated price reports" taken from NASA's TechTrackS system".

[192] RAND, National Defense Institute, Wind Tunnel and Propulsion Test Facilities, Supporting Analysis to an Assessment of NASA's Capabilities to Serve National Needs, pp. 44, 46-47, 55, and 60 (2004) (Exhibit US-116) (Showing significant military use of the Langley 14x22 foot wind tunnel and Langley 16 foot transonic tunnel, majority military usage of the Ames National Full-Scale Aerodynamics Complex 40x80 foot and 80x 120 foot tunnels, and almost exclusive use by the military for the Ames Unitary Plan Wind Tunnel.)

[193] As discussed in the U.S. response to Question 352. If the Panel decides that such an allocation is appropriate, it should be based on Boeing's percentage of actual contracting with NASA, and not on its share of production of civil aircraft and parts.

165. The United States submitted copies of all of the available hard copies of estimated price reports with their respective Space Act Agreements. These were related to SAA-469, SAA1-588, SAA1-640, and SAA1-738.[194] Exhibit US-1357 contains the output from the TechTrackS system for the Space Act Agreements reported in Exhibit US-1256(revised). These are the only records available to NASA with regard to the Space Act Agreements between Boeing and the four aeronautics centers. These records allow the Panel to see how the information reported in Exhibit US-1256(revised) relates to agency records and databases.

> *(b) Please explain what the "cost elements" contained in NASA's estimated price reports cover. For example, exhibit EC-402 lists, as one cost element, Contracts, Purch., Grants, Materials, etc.". What is covered by "Contracts, Purch., Grants, Materials, etc."?*

166. Because the content of specific cost elements on Estimated Price Reports ("EPRs") can vary depending on the nature of the cooperation that is addressed by the EPR, the best source for the panel on the content of EPR cost elements would be NASA Procedural Requirement ("NPR") document 9090.1.[195] This document, promulgated by the NASA Office of the Chief Financial Officer, provides the CFO's guidance on reimbursable agreements and is the guiding document for filling out EPRs. The overall guidance is that "A facsimile worksheet constituting an EPR shall provide support for full costs of the project, clearly identify the components of the price to be charged to the customer, and account for any costs that are waived in order to arrive at the price to be charged."[196]

167. Appendix C to NPR 9090.1 provides line-by-line instructions for completing a sample EPR. With respect to the example cited by the panel, the cost element "Contracts, Purch., Grants, Materials, etc.," the appendix states:

> The costs included in this element of the EPR depend on the technical resources that NASA is asked to provide in a particular Space Act Agreement. This element may include costs of contractors that support the routine operation and maintenance of NASA facilities used in performing the Space Act Agreement, purchases of other supplies or services necessary to perform NASA's role under the agreement, and the cost of materials consumed in the operation of the NASA facility used in performance of the Space Act Agreement.[197]

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[194] Exhibit US-521(BCI), pp. 6-11/54, 20-21/54, 34-35/54, and 54/54; Exhibit US-112(BCI), pp. 12-14/33; Exhibit US-70, pp. 6-7/50 and 39-50/50; and Exhibit US-109(BCI), pp. 14-19/44.

[195] NPR 9090.1 (Sept. 30, 2008) (Exhibit US-1364).

[196] NPR 9090.1, para. 2.4.2, p. 14 (Exhibit US-1364).

[197] NPR 9090.1, Appendix C, p. 41 (Exhibit US-1364).

The sample EPR indicates the information that must appear in every EPR. Individual centers may include additional information, or use a different format, as long as they include all the information listed in the sample EPR.[198]

352. In US RPQ 175, paras. 161-162, the United States indicates that it is not possible to value the facilities, equipment, and employees provided to Boeing under procurement contracts, but that if the Panel wished to perform an estimate, "it could use the Boeing share of payments made under contracts, cooperative agreements, grants, and government agreements to estimate the Boeing share of any overall provisions of goods or services that it finds to exist." Please clarify.

168. The United States has explained that NASA personnel work to advance NASA's objectives, and not those of NASA's contractors. Similarly, NASA uses its facilities and equipment for the agency's own work, and makes them available to contractors only when necessary to conduct the research that NASA purchased under a particular contract. Thus, facilities or equipment made available to contractors for use in fulfilling the contract are not "provisions" in the sense of Article 1.1(a)(1)(iii). It is telling that the standard contract clause on government property made available to contractors requires that the contractor return either any remaining goods or equipment to NASA at the end of the use period, or sell the goods and equipment and give the money to NASA.[199] The agency is not giving away anything. It merely allows temporary usage for specific purposes of performing the work specified under the contract.

169. Nor does NASA "provide" employees to its contractors in the sense that Article 1.1(a)(1)(iii) covers services supplied by the government. For the most part, NASA employees

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[198] NPR 9090.1, para. 2.4.2, p. 14 (Exhibit US-1364).

[199] 48 CFR § 52.245-5(h)(8)(ii) (Exhibit US-1328) states:

> The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the cost of the work covered by this contract or paid to the Government as directed by the Contracting Officer. The foregoing provisions shall apply to scrap from Government property; *provided*, however, that the Contracting Officer may authorize or direct the Contractor to omit from such inventory schedules any scrap consisting of faulty castings or forgings or of cutting and processing waste, such as chips, cuttings, borings, turnings, short ends, circles, trimmings, clippings, and remnants, and to dispose of such scrap in accordance with the Contractor's normal practice and account for it as a part of general overhead or other reimbursable costs in accordance with the Contractor's established accounting procedures.

48 CFR § 45.102(b) (Exhibit US-1327) provides that:

> Contracting officers shall provide property to contractors only when it is clearly demonstrated – (1) To be in the Government's best interest; (2) That the overall benefit to the acquisition significantly outweighs the increased cost of administration, including ultimate property disposal; (3) That providing the property does not substantially increase the Government's assumption of risk; and (4) That Government requirements cannot otherwise be met.

work independently from NASA contracts. Of those NASA employees who perform contract-related work, most manage the contract or monitor compliance rather than working to advance the substantive objective of the contract.

170. Despite the many objections to a methodology that treats NASA facilities, equipment, and employees as working for private enterprises, the U.S. response to Question 175 sought to assist the Panel in valuing the facilities, equipment, and employees related to contracts if it nonetheless found that they were "provided" to contractors in the sense of Article 1.1(a)(1)(iii) of the SCM Agreement and conferred a benefit. The suggestion was that if the Panel considered a class of NASA personnel or other expenditures to be in reality a good or service provided to contractors, it could determine the share attributable to Boeing based on the company's 10.4 percent,[200] share of the total value of NASA aeronautics research contracts in the 1989-2006 period.

171. To take an example, for most of the period, NASA divided its budget between program budgets (covering expenditures under contracts, cooperative agreements, and grants with outside suppliers) and "Institutional Expenses" (which covered primarily personnel costs).[201] If the Panel were to conclude that some portion of one of these budgets represented facilities, equipment, or employees provided to contractors, it could allocate part of that value to Boeing based on the company's share of contracting.

172. To give a numerical example, the EC asserts that the sum of program budgets under the challenged programs from 1989 to 2006 was $12,235 million.[202] NASA's data show that the agency paid contractors (including Boeing) $7,446 million to conduct aeronautics research during that period,[203] indicating that payments under other types of contracts were $4,789 million. If the Panel decided that some portion of these expenses were a financial contribution to contractors within the meaning of Article 1.1(a)(1) of the SCM Agreement,[204] it could multiply the value of that portion by Boeing's 10.4 percent share of the total value of aeronautics research

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[200] US RPQ 175, para. 155.

[201] "Institutional expenses," comprised civil servant salaries, benefits, costs of administrative buildings, travel, maintenance, office equipment, electricity, library services, and vehicles. Payments to non-NASA entities under contracts, cooperative agreements, government agreements, and grants represented a large portion of program budgets. The HSR program budget had $1.00 in contracts and grants spending for every 52 cents of non-contract costs, meaning that approximately 2/3 of all spending was for payments under contracts or grants. US Comment on EC RPQ 148, paras. 164 & 171; US Comment on EC RPQ 158(h), para. 253; US Comment on EC RPQ 166, paras. 263 & 265.

[202] See U.S. response to Question 334 ($12,365 million total, minus $130 million on the ACEE program, all of which predated 1989.

[203] US RPQ 175, para. 155.

[204] The United States notes that any such valuation would have to take account of the fact that the large (but unsegregable) majority of NASA budgets not devoted to funding of contracts is used to fund NASA's own in-house research independent of contractors, with results disseminated to the broader public.

contracts, to estimate a value to Boeing. Because this approach is based on real data on NASA's expenditures, it would estimate Boeing's share of any NASA costs more accurately than the EC's approach based on Boeing's share of sales of civil aircraft and parts. The Panel could take a similar approach if it decided that some portion of the Institutional Expenses budget, which the EC alleges was $6,469 million in the 1989-2006 period, also constituted a financial contribution within its terms of reference.[205]

173. The United States emphasizes that it has shown that NASA devoted its facilities and employees to achieving NASA's goals of developing and disseminating foundational research, and that none of these activities were goods or services "provided" to contractors. However, if the Panel were to conclude otherwise, the calculation outlined by the United States reflects real data about the breadth of NASA research and the variety of its contractors. It also reflects the reality that NASA contracts with other private entities under the same regulations and bidding conditions that it uses for Boeing contracts. Its employees oversee and manage work performed by all of its contractors, including cooperative agreement partners, grant recipients, and government agency collaborators just as they do with Boeing. Thus, there is no basis to assume, as the EC does, that all NASA costs are attributable to Boeing based on its share of the industry producing civil aircraft and parts, rather than on the basis of its share of NASA's total payments under aeronautics research contracts.

174. The United States reiterates that it does not consider NASA's in-house spending under program budgets or its spending under the Institutional Support budgets as the provision of goods or services to any contractor. It provides this example to show how the Panel could use the available information to perform a bottom-up analysis based on facts, rather than the incorrect assumptions necessary to rely on the EC's figures.

353. The US estimate of the value of NASA facilities, equipment and employees provided to Boeing pursuant to Space Act Agreements represents only a small fraction of the US estimate of the value of payments made to Boeing under the programmes, and only a tiny fraction of the overall budget expenditures under the eight aeronautics R&D programmes. Please explain how, in the view of the United States, the Panel can satisfy itself as to the relative significance of contributions of facilities, equipment and employees by NASA through Space Act Agreements to the overall budget expenditures under the eight aeronautics R&D programmes.

175. While NASA's testing facilities are generally excellent, they represent only a small part of what the agency does. The primary users of those facilities are NASA and other government agencies. In fact, an outside study in 2002 of wind tunnel and other testing facility usage

[205] Any calculation attempting to relate NASA's non-contract costs to Boeing would have to avoid double counting the Space Act Agreements reported in Exhibit US-1256(revised). Any NASA contribution of employee time under those agreements is paid through the Institutional Support budget, while facilities or equipment would be paid through the relevant program budget.

projected that NASA and DoD would be the only users of NASA's supersonic, hypersonic, and propulsion testing facilities through 2008. The study projected that industry would represent between one-quarter of the U.S. need for the transonic facilities, and one-third of the need for subsonic facilities.[206] Even when industry has need of testing facilities, it often chooses not to use NASA's because the cost is too high. For some purposes, U.S. commercial users consider foreign facilities to be better than NASA's, and prefer to use them.[207] Thus, use of NASA facilities for research related to civil aircraft – the only reason a Space Act Agreement would be relevant to this dispute – is small in proportion to other uses.

176. The Panel can also satisfy itself as to the relative value of facilities, equipment, and employees provided under Space Act Agreements based on the evidence submitted by the United States and the EC. NASA has performed a thorough search of both electronic and paper files for information on Space Act Agreements with Boeing. The EC has conducted its own search, and alleged that there are additional relevant Space Act Agreements. The United States explained that most of the agreements identified by the EC were not funded through the challenged programs.[208] However, the more critical point for this question is that the evidence shows that the values involved in the agreements cited by the EC were not large enough to change the conclusion that the aggregate value of Space Act Agreements is relatively small compared to the aggregate value of contracts.

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360. How does the United States respond to the argument of the European Communities that "{t}he United States' repeated attempts to correct and revise its lists of contracts itself raises doubts about the accuracy of those lists" (EC Comments on US RPQ 210, para. 249)?

177. The U.S. corrections to the DoD contracts list in fact reflect the difficulties that the EC has created by its confusing organization of its claims, rather than any inaccuracy in the lists. The EC, in collaboration with consultants whom it describes as "experts" on DoD procurement, decided to organize its RDT&E claims around 23 "program elements." These are for the most part budget accounts that do not correspond exactly to one DoD office or substantive research effort. Thus, a program element is not a "program" in the sense of an organized effort by dedicated staff and institutional structure to achieve an objective. The "program elements" are merely accounts against which multiple programs may draw to finance their objectives.[209] The

[206] RAND, National Defense Institute, Wind Tunnel and Propulsion Test Facilities, Supporting Analysis to an Assessment of NASA's Capabilities to Serve National Needs p. 21 (2004) (Exhibit US-116).

[207] US FWS, paras. 242-244; RAND, National Defense Institute, Wind Tunnel and Propulsion Test Facilities, Supporting Analysis to an Assessment of NASA's Capabilities to Serve National Needs p. 33 (2004) (Exhibit US-116).

[208] US Comment on EC RPQ 172, paras. 298-303.

[209] For example, when Boeing performed work under contract for the Air Vehicle Technology Integration Program (AVTIP), DoD drew funding from PEs 0602201F (covering aerospace flight dynamics and aerospace

budgeting effort (which monitors program elements) and the funding offices (which fund contracts) use different computer databases that do not interface with each other, leaving no systematic way for DoD to relate the EC's claims to the work that it performs.

178. Therefore, to relate the EC's unsubstantiated assertions to DoD's actual activities, DoD officials used the EC's description of the research that supposedly benefited civil aircraft to identify contracts with Boeing that appeared relevant to an evaluation of the EC claims. To do so, they consulted paper files, computerized records, and individual recollections stretching back over more than a decade.[210] Using the criteria identified in US RPQ 7, para. 7, the United States assembled the set of DoD contracts submitted with the first written submission. Considered in isolation, this would not be an ideal way to assemble information, but in the context of the organization of the EC claims, it was the most accurate way.

179. The corrections to which the EC refers are a function of the U.S. effort to ensure that its data set was as accurate as possible and corresponded as closely as possible to the EC claims. Some corrections responded to questions from the Panel or observations from the EC. This record of cooperation far outweighs that of the EC, which in the face of numerous and manifest errors in its data simply insists – against all the evidence – that its calculations are fine, and challenges the United States to propose corrections to the EC's work.

180. The United States also notes that the task facing the Panel is to evaluate whether the EC has made a *prima facie* case as to the magnitude it attributed to the alleged DoD RDT&E subsidies. If it finds such a *prima facie* case, it must then consider whether the United States has rebutted the EC's case, based on an evaluation of the weight and credibility of all the evidence.[211] Thus, the proper question is whether the U.S. evidence is more credible than the EC's efforts and entitled to greater weight.

181. In this regard, the United States has shown that the sole support for the EC's effort to value the alleged subsidies, a report by consultant CRA, is biased, cursory, and unsupported by the facts.[212] Thus, even considered in isolation, the EC's assertions fail to make a *prima facie*

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vehicle technologies), 0603205F (covering flight vehicle technology), and 0602203F (covering aerospace propulsion). When Boeing performed work for the Composites Affordability Initiative, DoD drew funding from PEs 0602102F (covering defense research sciences), 0708011F (covering manufacturing technology/industrial preparedness), and 0603211F (covering aerospace structures and aerospace technology development/demonstration). DoD Contracts with Funding from Multiple PEs, p. 1 (Exhibit US-1267).

[210] US FWS, paras. 159-161; US RPQ 7, paras. 7-8.

[211] The United States discusses the nature of this evaluation in greater detail in its response to Question 342.

[212] US RPQ 207, paras. 252-263; US RPQ 208(a) , paras. 264-277 & 286; US RPQ 208(c), paras. 295-298; US RPQ 208(d), para, 299; US RPQ 208(e), paras. 300-318; US Comment on EC RPQ 170(a), para. 284; US Comment of EC RPQ 200, paras. 356-359; US Comment on EC RPQ 201, paras. 360-364; US Comment on EC RPQ 202, paras. 365-367; US Comment on EC RPQ 203, paras. 370-373.

case. In contrast, the U.S. contract list has the support of physical copies of the contracts in question, along with their modifications. It does not rely on any assumptions as to what DoD does, but instead on evidence as to the actual activities covered by DoD RDT&E contracts. Thus, it is in any event more credible and entitled to greater weight than the CRA report on which the EC relies.

361. How does the United States respond to the argument of the European Communities that "{t}he fact that certain dual-use (i.e., LCA-related) DOD RDT&E contracts identified by the European Communities did not fall under the 23 specific PEs referenced throughout these proceedings is irrelevant, as the European Communities has challenged all *LCA-related R&D funding and support provided by DOD through its RDT&E Program, and not just 23 specific PEs" (EC Comments on US RPQ 213, paras. 262-268.)?*

182. In asserting that it has challenged all LCA-related RDT&E funding, rather than only the 23 program elements it previously described as "at issue" in this dispute, the EC contradicts its previous submissions to this Panel. For the EC to expand the scope of its claims at this stage is inconsistent with the DSU, and prejudicial to the United States and the Panel.

183. The EC cites three documents in an effort to support its position that this Panel's terms of reference cover research outside of the 23 PE numbers: (1) its request for consultations on June 27, 2005, (2) its request for establishment of a panel on January 20, 2006, and (3) its first written submission on March 22, 2007. However, these documents do not support the EC's current attempt to ascribe a "broad nature" to its challenge to DoD's RDT&E spending. To the contrary, they evince a focus on the 23 PE numbers to the exclusion of other DoD RDT&E funding.

184. The EC states this unambiguously in its first written submission, where the section entitled "legal considerations" states:

> the *entirety* of the financial contributions to Boeing's LCA division can be considered to confer benefits. Thus, the European Communities estimates that the *total* benefits to Boeing's LCA division from these RDT&E Program subsidies are valued at $2,379.0 million through 2006.[213]

The $2,379 million figure is the value that CRA ascribed to research under the 23 PE numbers. Thus, in the view of the EC at the time of the first written submission, these PE numbers represented "the entirety of the financial contribution" at issue, and the "total benefits" to Boeing. It is impossible to reconcile this statement with the position the EC now takes that its allegations of financial contribution and benefit extend to *all* DoD RDT&E.

185. The EC asserts that the "structure" of the DoD RDT&E arguments in its first written submission evinces the "broad nature" of its challenge. In reality, the organization of the EC

[213] EC FWS, para. 766 (emphasis added).

arguments reflects the legal conclusion that the 23 PE numbers represent "the entirety of the financial contribution." Its only detailed factual presentation appears in the sections entitled "General Aircraft RDT&E PEs Funding LCA-Related Technology," "Military Aircraft RDT&E PEs Funding LCA-Related Technologies," and "Additional Details Related to Selected RDT&E PEs."[214] The titles themselves betray the focus on the identified PE numbers, and the text follows suit. The first of the sections deals exclusively with 13 of the 23 project elements.[215] The second section deals exclusively with the ten remaining PEs in the EC's list of 23, which relate to specific military aircraft.[216] The third section circles around to provide greater detail on some of the previously discussed PEs.[217] In short, the EC's first written submission does not suggest that its claim goes beyond the 23 identified PEs, and provides no information that would allow a Panel to evaluate any claim with regard to research outside of those areas.

186. The EC's second consultation request, filed on June 27, 2005, does not support an expansive reading, either. Although the EC did not reference the 23 PE numbers explicitly, the context of the request makes clear that they were the subject of any DoD RDT&E claims. The opening paragraph of June 27, 2005, consultation request explains that the EC sought consultations with reference to

> the United States' statement at the meeting of the Dispute Settlement Body ("DSB") on 13 June concerning the European Communities' request for the establishment of a Panel in the above case {DS317}, where you asserted that 13

[214] EC FWS, paras. 680-70, 709-723, and 724-761, respectively.

[215] EC FWS, para. 681 (Defense Research Sciences, 0601102F); paras. 683-685 (Materials, 0602102F); paras. 686-687 (Aerospace Flight Dynamics/Aerospace Vehicle Technologies, 0602201F); Aerospace Propulsion, 0602203F; paras. 690-691 (Aerospace Avionics/Aerospace Sensors, 0602204F); paras. 692-694 (Dual Use Science & Technology, 0602805F); paras. 695-696 (Advanced Materials for Weapons Systems, 0603112F); paras. 697-698 (Flight Vehicle Technology, 0603205F); paras. 699-700 (Aerospace Structures/Aerospace Technology Dev/Demo, 0603211F); paras. 701-702 (Aerospace Propulsion and Power Technology, 0603216F); paras. 703-704 (Flight Vehicle Technology Integration, 0603245F); paras. 705-706 (RDT&E for Aging Aircraft, 0605011F); and paras. 707-708 (Industrial Preparedness/Manufacturing Technology, 0708011F, 0603771F, and 0708011N).

[216] EC FWS, para. 715 (V-22, 0604262N); para. 716 (F/A-18 Squadrons 0204136N); para. 717 (Joint Strike Fighter, 0603800F and 0603800N); paras. 718-720 (C-17, 0604231F and 0401130F); paras. 721-722 (CV-22, 0401318F; F-22, 0604239F; B-2 Advanced Bomber,0604240F; Comanche, 0604223A; A-6 Squadrons, 0204134N; and AV-8B aircraft, 0604214N). The half-page discussion of six aircraft (paras. 721-722) says virtually nothing specific about any of them.

[217] ECFWS, paras. 725-741 (Dual Use Science & Technology, 0602805F); paras. 742-749 (Industrial Preparedness/Manufacturing Technology, 0708011F, 0603771F, and 0708011N); and paras. 750-761 (composite research conducted under Defense Research Sciences, 0601102F; Materials, 0602102F; Aerospace Flight Dynamics/Aerospace Vehicle Technologies, 0602201F; Dual Use Science & Technology, 0602805F; Aerospace Structures/Aerospace Technology Dev/Demo, 0603211F; Industrial Preparedness/Manufacturing Technology, 0708011F, 0603771F, and 0708011N).

> of the 28 subsidy programs referenced in the panel request were not listed in the consultation request of 6 October 2004.[218]

The panel request referenced in that statement was one that the EC submitted on May 31, 2005, arising from the EC's initial consultation request with regard to large civil aircraft subsidies. The June 27, 2005, consultation request states that the EC sought a "continuation" of the consultations that led to that panel request "in order to clarify and, if possible, resolve" the "issues raised in these proceedings."[219] Those "issues" were, of course, the U.S. statement at the DSB meeting that the EC had failed to consult with regard to all of the measures cited in the May 31, 2005, panel request.[220] Among those measures were the 23 PE numbers.[221] Thus, the entire point of the consultations was to consult over programs, including the 23 PE numbers, cited in the May 31, 2005, panel request that were not cited in the EC's original request for consultations of October 6, 2004. An explicit listing was unnecessary because the EC reference to its panel request had already made clear that they were to be discussed.[222]

187. The EC argues that its panel request of January 20, 2006, "clearly challenges *all* LCA-related R&D provided by DOD through its RDT&E budgets," and that the 23 PE numbers were merely "examples" of the types of PE numbers that the EC challenged.[223] However, the request is "clear" about nothing. It states:

> The Department of Defense ("DOD") transfers economic resources to the US LCA industry on terms more favourable than available on the market or not at arm's length, inter alia, by:
>
> a. allowing the US LCA industry to participate in DOD-funded research, making payments to the US LCA industry for such research, or enabling the US LCA industry to exploit the results of such research … through, for example:

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[218] *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)*, Request for Consultations, DS353/1, WT/DS317/1/Add.1, G/L/698/Add.1, G/SCM/D63/1/Add.1, p. 1 (1 July 2005).

[219] *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)*, Request for Consultations, DS353/1, WT/DS317/1/Add.1, G/L/698/Add.1, G/SCM/D63/1/Add.1, p. 1 (1 July 2005).

[220] Minutes of Meeting Held in the Centre William Rappard on 13 June 2005, WT/DSB/M/191, para. 14 (28 June 2005).

[221] *United States – Measures Affecting Trade in Large Civil Aircraft*, Request for Establishment of a Panel by the European Communities, DS317/2, section 4.a (3 June 2005).

[222] *United States – Measures Affecting Trade in Large Civil Aircraft*, Request for Consultations by the European Communities, WT/DS317/1 (12 Oct. 2004).

[223] EC Comment on US RPQ 213, para. 264, *quoting United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)*, Request for Establishment of a Panel by the European Communities, WT/DS353/5, section 3.a (23 Jan. 2006).

> (i) A number of Research, Development, Test, and Evaluation ("RDT&E") Programs of the US Air Force, Navy, Army, and the Defense Advanced Research Projects Agency ("DARPA") including, but not limited to:
>
> {23 PEs and DUAP}.
>
> These Programmes are currently reflected in, inter alia:
>
> • DOD RDT&E Budget Item Justification, Exhibits R-2, FY 1991 – FY 2007;
>
> • DOD FY 1991 – FY 2007 Budgets for RDT&E Programs (Exhibit R-1), DOD Component Summary ….[224]

This request offers no clarity as to what sort of "economic resources" the EC is challenging or the nature of the payments involved, or as to what sort of research the EC seeks to challenge. It is clear only that the EC challenges some subset of DoD research, but provides no way to identify exactly what it is. In fact, to the extent there is any clarity at all, it comes exclusively from the EC's statement that the alleged subsidy had something to do with the 23 PE numbers. Thus, the claim as laid out in the panel request cannot extend beyond the named PE numbers.

188. The EC's effort to challenge "*all* LCA-related R&D provided by DoD through its RDT&E budgets" fails for another reason. Assuming, *arguendo*, that the EC was seeking to challenge all RDT&E, Article 6.2 of the DSU requires that the EC request for establishment of a panel "identify the specific measures at issue and provide a brief summary of the legal basis of the complaint sufficient to present the problem clearly." The narrative portion of the claim indicates only that it applies to "DoD-funded research" without making clear which research or how it is funded. The only additional text states that the research involves either payments to the "US LCA industry" (defined earlier as "US producers of large civil aircraft . . . including {Boeing} and McDonnell Douglas.") or participation by that industry in research.[225] In its effort to defend the "broad nature" of its claim, the EC asserts that the text following this narrative, which includes the list of PE numbers, consists exclusively of "*examples* of the types of PEs" that it challenges. If so, the list provides no specificity at all. In 2004 alone, DoD's RDT&E budget consisted of more than 800 PE numbers. The EC provides no way to identify which of those funding accounts (other than the 23 named ones) it seeks to challenge as "LCA-related." In fact, it concedes this point in recognizing that even after three years of this dispute, the EC's description of its "*all* LCA-related" research claim remains so incoherent that even DoD officials

[224] EC Response to US RPQ 213, para. 264 (elipses in original).

[225] *United States – Measures Affecting Trade in Large Civil Aircraft (Second Complaint)*, Request for Consultations, DS353/1, WT/DS317/1/Add.1, G/L/698/Add.1, G/SCM/D63/1/Add.1, section 3.a (1 July 2005).

knowledgeable in aerospace technology cannot discern what research it covers.[226] Thus, if the EC really did attempt to challenge a broader category of DoD research, its panel request failed to meet the Article 6.2 specificity requirement, and that broader category of research would, therefore, not be within the Panel's terms of reference.

189. Although demonstrating prejudice to the responding party is not a requirement for a claim under Article 6.2, if the EC really seeks to challenge "*all* LCA-related" research, the vagueness of its request for panel establishment has clearly prejudiced the United States. As the Appellate Body has repeatedly found, a panel's terms of reference are important because "they give the parties and third parties sufficient information concerning the claims at issue in the dispute to allow them an opportunity to respond to the complainant's case."[227] In addition, "{t}he Appellate Body has consistently maintained that, where a panel request fails to identify adequately particular measures or fails to specify a particular claim, then such measures or claims will not form part of the matter covered by the panel's terms of reference."[228] If the EC has challenged measures outside the "23 PEs at issue," its failure to specify what these are has left the United States no way to identify relevant information to present in its defense. The EC's lack of specificity also prejudices the Panel, which after 3½ years of work and thousands of pages of submissions would have to address a further set of amorphous claims. And the EC's lack of specificity meant that potential third parties could not have a clear understanding of the

[226] EC Comment on US RPQ 213, para. 267. Thus, the five contracts outside the U.S. compilation that the EC considers related to dual-use aeronautics technology do not "call into question the validity and completeness of the US compilation" as the EC asserts. They instead demonstrate the EC's inability to provide a comprehensible description of the scope of its claim. In fact, several of those contracts were initially gathered by DoD, but omitted because they were not funded by any of the "23 PEs at issue" and, therefore, appeared irrelevant to the arguments put forward in the EC's first written submission. The EC's statement in paragraph 268 that the U.S. ability to identify the PE numbers funding a particular contract "remarkable . . . at this late stage" shows a degree of inattention on the EC's part. The U.S. first written submission explained that:

> DoD does not maintain a systematic database linking contracts to particular PE numbers. Therefore, we identified relevant contracts based on narrative descriptions of the subject matter and manually verified that they were funded from PEs listed by the EC.

US FWS, para. 160, note 218. Thus, it has been clear from the outset that, given a contract number, the United States can identify the PE numbers through which it was funded. US RPQ 210, para. 232, item (4) explained further that this manual review was based on funding codes included in the hard copies of contracts and modifications.

To be absolutely clear as to the limitations of DoD's computer systems, DoD's contracts database does not have a field for the PE numbers that fund disbursements, because that information is not important to its task of supporting contract management. DoD's budgeting database does not contain a field for the contract numbers funded through particular PE numbers because that information is not important to the task of developing overall budgets. Therefore, DoD has no way to query either system to identify contracts funded through a particular PE. These data do come together, however, in the hard copies of the contracts, so that once DoD has a contract number and can obtain hard copies of contracts and modifications, the United States can manually identify funding sources.

[227] *India – Patents (AB)*, para. 87, *quoting Brazil – Desiccated Coconut (AB)*, p. 22.

[228] *Dominican Republic – Cigarettes*, WT/DS302/AB/R, para. 20 (adopted May 19, 2005).

types of research at issue and therefore could not decide whether to reserve their third party rights in the proceeding.

362. It is the Panel's understanding that, under U.S. government accounting rules, IR&D and B&P costs may be allocated to a "segment" of a contractor only if the costs bear a "beneficial and causal relationship" to that segment (US Second Written Submission, para. 80, citing 48 C.F.R. §9904-420-40 (Exhibit US-131); 48 C.F.R. § 9904.418-40(c) (Exhibit US-1141)).

(a) What does "beneficial and causal relationship" mean in this context?

190. The relationship prescribed in the referenced sections of CAS 418 and 420, i.e., the "beneficial or causal relationship"[229] can be clarified by paraphrasing the pertinent fundamental requirements of the referenced standards as follows:

> **48 C.F.R. 9904.418-40(c)**: "pooled costs shall be allocated to cost objectives in reasonable proportion to the beneficial or causal relationship of the pooled costs to cost objectives" can be paraphrased as: pooled costs shall be allocated in reasonable proportion to cost objectives which benefit from them or to cost objectives which caused their incurrence.
>
> **48 C.F.R. 9904.420-40(d)**: "the IR&D and B&P cost pools of a home office shall be allocated to segments on the basis of the beneficial or causal relationship between the IR&D and B&P costs and the segments reporting to that home office" can be paraphrased as: the IR&D and B&P cost pools of a home office shall be allocated to segments which benefit from them or which caused their incurrence.

Thus, a cost is allocable if it benefits a cost objective or is caused by a cost objective.

191. U.S. government procurement laws and regulations do not define the terms "beneficial" or "causal." However, the regulations do contain examples that illuminate the meanings of these terms:

- Management and supervision costs must be allocated to the activity being managed on a base representative of that activity, such as the number of direct labor hours.[230]

[229] The quotation in paragraph 80 contains a typographical error. It should have read "beneficial *or* causal relationship". This error did not affect the analysis contained in that paragraph or in the larger discussion of IR&D expenses.

[230] 48 CFR §§ 9904.418-40(c)(1) and 9904.418-50(d)(2) (Exhibit US-1338).

- Costs of occupancy of a building, such as rent and cleaning, may be allocated to activities that use the building in proportion to the amount of space used;[231]
- Overhead costs for a machining unit may be allocated to the activities for which the unit does work, based on the number of hours of work provided;[232]
- Costs of operating a company aircraft may be allocated to cost objectives (contracts) based on the flight hours devoted to work toward each cost objective;[233]
- Costs of IR&D conducted by one segment at the request of another, and not in the performing segment's IR&D work plan, may be allocated to the requesting segment;[234]
- Costs of IR&D that do not benefit a segment may not be allocated to that segment.[235]

As these examples illustrate, costs typically have a beneficial relationship to a segment if they advance one of the activities of that segment. Costs have a causal relationship to a segment if the segment requested that they be incurred.

(b) How does Boeing determine whether IR&D and B&P costs incurred by IDS bear a "beneficial and causal relationship" to Boeing's LCA segment?

192. DoD procurement regulations require Boeing, like other contractors, to maintain an accounting system and related internal controls that provide reasonable assurance, among other things, that it

- complies with applicable laws and regulations; and;
- minimizes misallocations and mischarges.

Determining whether IR&D and B&P costs incurred by IDS bear a "beneficial or causal relationship" to Boeing's large civil aircraft is part of Boeing's requirement to maintain an

[231] 48 CFR § 9904-418-60(e) (Exhibit US-1338).

[232] 48 CFR § 9904-418-60(g) (Exhibit US-1338).

[233] 48 CFR § 9904-418-60(h) (Exhibit US-1338).

[234] 48 CFR § 9904-420-60(d) and (e) (Exhibit US-1339).

[235] 48 CFR § 9904-420-60(g) (Exhibit US-1339).

accounting system and related internal controls to ensure compliance with the Cost Accounting Standard 420.[236]

193. Boeing satisfies this requirement for IR&D costs by allocating to each segment the full cost of any IR&D projects identified, planned, and executed by that segment. If an IR&D project is identified, planned, and executed on behalf of both BCA and IDS, Boeing treats the cost of that project as common enterprise expenditure, and allocates it to BCA and IDS in accordance with federal acquisition regulations.[237] Boeing reviews its IR&D classifications each year, and if a project's beneficial or causal relationship with a segment changes, Boeing changes the classification of the cost accordingly. For example, if the review of an IDS IR&D project demonstrates a prospective value for BCA, the cost of project is reassigned to the enter-rise-wide common cost pool.[238] Cost Accounting Standard 420 specifically envisages this methodology,[239] DCAA audits Boeing on an ongoing basis to ensure the company's compliance with this and other accounting rules. If Boeing fails, the government may levy serious penalties, including disbarment from future government contracting.[240]

194. Boeing's IR&D review process does not retroactively reallocate IR&D costs when one segment decides that it is interested in an IR&D project conducted by another. Sometimes this practice will allow IDS to use the results of an IR&D project funded in whole or in part by BCA, and sometimes BCA will get the advantage of an IR&D project funded in whole or in part by IDS. Given that civil technology is generally ahead of military technology in areas where there is overlap,[241] the net flow from BCA to IDS is likely to be larger in volume than the flow from IDS to BCA.

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[236] 48 C.F.R. 9904.420-40(d), -50(d) and (e) (Exhibit US-131).

[237] Affidavit of David Ramey, para. 3 (Exhibit US-1340).

[238] Affidavit of David Ramey, para. 3 (Exhibit US-1340).

[239] 48 C.F.R. 9904.420-50 (Exhibit US-131).

[240] Statement of David Ramey, para. 4 (Exhibit US-1340).

[241] *See* US FWS, para. 124; *Federal-funded defense research vs. non-federally funded research* (Exhibit US-36). The DoD intellectual property contracting handbook submitted by the EC makes the same point:

> In the past, research programs funded by the Department of Defense (DoD) often led industry efforts in technology. Today the reverse is largely the case – technology leadership has shifted to industry, where most research and development (R&D) dollars are spent.
>
> > "Budget pressures have squeezed military R&D spending in recent years ... down 30% from its inflation-adjusted peak in 1989. Meanwhile, the private sector's share of total R&D expenditures in the U.S. is soaring. In 1960, private-sector R&D spending amounted to roughly one third of the country's total. In 1999, it accounted for two thirds (an estimated $166 billion). Over the same period, the military's share dropped to 16% from 53%."

Intellectual Property: Navigating Through Commercial Waters, p. iii (Oct. 15, 2001) (Exhibit EC-557).

(c) The United States indicates that IR&D and B&P "may" be allocated to Boeing's LCA segment "only if" the costs bear a beneficial and causal relationship to that segment. Does this mean that Boeing is not required to allocate IR&D / B&P costs to its LCA segment even where there exists a "beneficial and causal relationship"?

195. No. The referenced sentence means that the federal acquisition regulations permit the allocation of IR&D and B&P to a single segment, *i.e.*, IDS or BCA, if and only if the costs bear a beneficial or causal relationship only to that segment. Conversely, if IR&D and B&P costs do not bear a beneficial or causal relationship to a particular segment, the regulations prohibit allocation of any of the costs to that segment. If an IR&D project is identified with more than one specific segment of Boeing (for example, with BCA and another segment), the cost of the project must, in accordance with CAS 420-50(e)(2), be

> allocated among all segments by means of the same base used by the company to allocate its residual expenses in accordance with 9904.403; provided, however, where a particular segment receives significantly more or less benefit from the IR&D or B&P costs than would be reflected by the allocation of such costs to the segment by that base, the Government and the contractor may agree to a special allocation of the IR&D or B&P costs to such segment commensurate with the benefits received.[242]

Thus, once a beneficial or causal relationship exists, allocation is mandatory.

(d) Does Boeing have a financial incentive to allocate only a small share of its IR&D / B&P costs to its LCA operations?

196. No. The Cost Accounting Standards (CAS), with which Boeing is contractually obligated to comply, provide Boeing with a set of accounting rules that require allocation of any costs, including IR&D and B&P costs, to cost objectives based on a beneficial or causal relationship. Accordingly, the CAS would deter contractors from inequitably allocating costs to their contracts, both government and commercial, within a segment or inequitably allocating costs to segments by a home office. The Cost Accounting Standards are, therefore, designed to prevent disproportionate or inequitable allocations of costs.

197. Further, the CAS administrative procedures at 48 C.F.R. §§ 9903.2 and 9903.3, with which Boeing is also contractually obligated to comply, provide effective disincentives for Boeing to violate the CAS, including retroactive contract price adjustments, interest assessments on overpayments that resulted from noncompliant practices, and debarment from future government contracting.

[242] 48 C.F.R. § 9904.420-50(e)(2) (Exhibit US-131).

198. Boeing Corporate Director of Business Operations David Ramey, notes that:

> each segment also has economic and institutional incentives to manage its IR&D portfolio solely for its own benefit, and not for the benefit of other segments. Specifically, each segment must win business in its own market. . . . With respect to IDS, in particular, the need to be competitive in the defense market means it will not engage in IR&D projects that it does not anticipate will advance its business with its primary customer – the U.S. military. Every dollar IDS spends on IR&D increases the overhead rate charge the government requires Boeing to use as a pricing element in bids for further military work. To the extent that Boeing's rates are higher than its defense industry peers – including, e.g., Northrop Grumman and Lockheed Martin, which do not have commercial businesses, Boeing risks losing future U.S. government business by virtue of uncompetitive pricing.[243]

From a practical standpoint, Boeing evaluates and compensates IDS managers and executives based on the profitability and competitiveness of IDS. They have no reason to accede in assuming costs to advance the business of BCA.

* * * * *

365. What is the source of the document submitted by the United States as Exhibit-191? Please provide a reference.

199. The source of the document submitted by the United States as Exhibit US-191 (Business and Occupation Tax – Differential Tax Rates) is a 2004 study prepared by the Washington State Department of Revenue, entitled A Study of Tax Exemptions, Exclusions, Deductions, Deferrals, Differential Rates and Credits for Major Washington State and Local Taxes. The study, which the Department of Revenue is required by Washington State law to prepare,[244] is available at the following link: http://gis.dor.wa.gov/content/aboutus/statisticsandreports/2004/tax_exemptions_2004/default.aspx.

366. According to the European Communities, the United States' interpretation of the Master Site Agreement ("MSA") renders the provisions of the MSA relating to 747 LCF Landing Fee Waivers and Utilities absurd and completely pointless (e.g. EC, Second Written Submission, paras. 160 and 193). How does the United States respond? Without limiting the generality of the foregoing:

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[243] Statement of David Ramey, para. 5 (Exhibit US-1340).

[244] RCW 43.06.400. The text of this provision is reproduced at Appendix 1 to the study identified in response to Question 365.

200. The EC continues to read obligations and benefits into the Project Olympus Master Site Agreement that just are not there. The MSA reflects an effort by Washington State and Boeing to address, in a comprehensive manner, a range of factors relevant to Boeing's operations in Washington State. For some of those factors, such as the 747 LCF landing fees, Boeing and the State had already established a practice that was satisfactory to both parties and that did not require changes. Indeed, this is not surprising as Boeing had been conducting operations in Washington State for many years prior to the MSA. In such instances, Washington State and Boeing merely sought to memorialize existing practice in the MSA. That is what happened with regard to the 747 LCF landing fees. With respect to other factors, such as utility rates, Boeing was subject to a legal regime that pre-dated the MSA, and the MSA merely clarifies that that pre-existing legal regime continues to apply.

a) In para. 555 of its First Written Submission, the United States argues that the "applicable regulated tariff rate" for utilities referred to in the MSA ("MSA"), is in fact a rate set by city ordinance which applies to all city of Everett retail customers other than residential customers. It also explains that the water rates are currently set by Ordinance 2805-04, sewer rates are set by Ordinance 2804-04, and solid waste rates are set by Ordinance 2753-04. Could the United States please refer the Panel to a specific provision in the text of the MSA which explains the notion of the "applicable regulated tariff rate"?

201. The Project Olympus Master Site Agreement ("MSA") does not provide a definition for "applicable regulated tariff rate" as it relates to utilities. However, it is clear from the ordinary meaning of the terms in that phrase that it reflects a dynamic concept and in no way precludes changes to the utility rate over time. The MSA merely confirms that utility rates, as set regularly by local regulations, apply to Boeing's operations.

202. Under Washington State law, since the MSA does not contain a definition of "applicable regulated tariff rate," an interpretation of this phrase would be governed by the plain meaning of the words contained in the phrase.[245] Beginning with "applicable," the plain meaning of "applicable" is "able to be applied (*to* a purpose etc.); having reference, relevant."[246] The term does not have specific temporal connotation, and, by its ordinary meaning, in no way precludes the possibility of periodic adjustments to the rate that is applicable.

[245] *Sovran, LLC v. Michelsen Dairy, Inc*., 2008 Wash. App. LEXIS 1956 at 13-14 (Ct. App. Wash. Aug. 12, 2008) (Exhibit US-1354) ("We interpret clear and unambiguous contract terms de novo as a question of law, and we give undefined terms their plain and ordinary meaning. We may refer to standard English dictionary definitions of terms.") *citing Wm. Dickson Co. v. Pierce County*, 128 Wn. App. 488, 493, 116 P.3d 409 (Ct. App. Wash 2005) (Exhibit US-1355). *See also, Kitsap County v. Allstate Ins. Co*., 136 Wn.2d 567, 576 (1998) (Exhibit US-1356) ("Undefined terms, however, must be given their 'plain, ordinary, and popular' meaning. To determine the ordinary meaning of undefined terms, courts may look to standard English dictionaries.") (internal citations omitted).

[246] *New Shorter Oxford English Dictionary*, p. 99.

203. Consistent with this plain meaning, Washington State understood the "applicable" rate in this context to be a dynamic concept in the sense that the applicable rate may be periodically adjusted. The EC's contention that the "applicable" rate must be the rate in effect at the time of the MSA without the possibility of adjustments, is inconsistent with Washington State's understanding of this provision and finds no support in the text of the MSA.

204. Further review of the terms "regulated", "tariff", and "rate" also confirm this. The plain meaning of "regulate" is to "control, govern, or direct by rule or regulations; subject to guidance or restriction; adapt to circumstances or surroundings."[247] Thus, something that is regulated is subject to control, governance or direction by rule or regulations, and is subject to guidance or restriction.

205. Additionally, "tariff" is defined as "a table or scale of fixed charges made by a private or public business, as a list of prices for a hotel, a schedule of rates payable for a public utility, etc."[248] and "rate" is defined as "the price paid or charged for a thing or class of things; *esp*. an amount paid or charged for a certain quantity of a commodity, work, etc.; a fixed or assigned price, charge, or value."[249] None of these terms has the temporal connotation that the EC suggests. Nothing in these terms suggests the sort of temporal limitation that the EC alleges.

206. The facts are even clearer. The United States has adduced considerable evidence demonstrating that the EC's contention that Washington State committed in the MSA to freeze Boeing's utility rates at the rates that were in effect at the time of the MSA is inaccurate and finds no support in the text of the MSA.

207. The fact that Washington State made no such commitment to freeze Boeing's rates has been demonstrated by Everett Utilities Rate Tables for 2004, 2006 and 2007, submitted as Exhibit US-230 with the U.S. first written submission. That exhibit shows that the rates paid by Boeing for water, filtration, and sewer, in fact, <u>increased</u> from 2004 to 2007.

b) The United States argues that in December 2002, Boeing and Paine Field extended their Joint Use Agreement from 2003 to 2005 and modified it to specifically "include{d} the introduction, testing, and production of additional aircraft models with no additional cost to Boeing." (US First Written Submission, para. 562) Additionally, the United States notes that, pursuant to the MSA there will be no additional fees or low fuel flowage charges for 747 Large Cargo Freighter (LCF) operations during flight test or cargo operations. (US First Written Submission, para. 563) Could the United States please clarify the relationship between the two provisions. Would the 747 Large Cargo Freighter

[247] *New Shorter Oxford English Dictionary*, p. 2530.

[248] *New Shorter Oxford English Dictionary*, p. 3222.

[249] *New Shorter Oxford English Dictionary*, p. 2481.

(LCF) operations be within or without the scope of the December 2002 extension of the Joint Use Agreement, and why?

208. As set forth in the U.S. first written submission, Boeing and Snohomish County operate pursuant to an agreement, which pre-dates the MSA, whereby in exchange for a flat fee for the use of Paine Field runway and airfield facilities, the per-plane landing fees for Boeing's aircraft are waived.[250] The 747 Large Cargo Freighter (LCF) is a Boeing aircraft, and as such, was covered by the original agreement. As the Panel points out, the December 2002 extension of the Boeing and Paine Field Joint Use Agreement, which also pre-dates the MSA, provided further clarification that the waiver of landing fees "include{d} the introduction, testing, and production of additional aircraft models with no additional cost to Boeing."[251] Consistent with the original agreement and the December 2002 extension, the March 2007 extension of the Boeing-Paine Field Joint Use Agreement, repeats the pre-existing agreement that the 747 LCF would not be subject to additional landing fees.[252]

209. The original agreement between Boeing and the County established that the 747 LCF would not be subject to per-plane landing fees. The December 2002 and March 2007 extensions and the relevant MSA provision merely reflect existing practice as established in the original agreement.

210. Finally, as set forth in the U.S. first written submission, the EC has failed to establish a *prima facie* case that Washington State provides a subsidy as it relates to the landing fees for the 747 LCF.[253]

367. In its submissions relating to the alleged "pass-through" from Spirit to Boeing of the benefits associated with future IRBs and KDFA bonds, the United States argues that the value of an asset being sold does not necessarily represent the price paid for it and that there is no basis to assume that the net present value of any anticipated future IRB benefits to Spirit went to Boeing. How does the United States reconcile its submissions on this issue with the economic reasoning employed in US – Countervailing Measures on Certain EC Products[254] at paragraph 7.65 and footnote 333, namely that, following the sale of an asset at arm's length and for fair market value, the purchaser is presumed to

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[250] US FWS, para. 56-61.

[251] *See* US FWS, para. 562 citing Boeing-Paine Field Joint Use Agreement Extension of 1996 Amendment through 2003, 2004, and 2005 (Dec. 17, 2002) (Exhibit US-234). It is important to clarify, however, that the U.S. first written submission did not state that the December 2002 extension "modified" the agreement to include operations with respect to additional aircraft models. The U.S. first written submission merely specified that the December 2002 extension contained the statement set forth above. *See* USFWS, para. 562.

[252] US FWS, para. 563 citing Boeing-Paine Field Joint Use Agreement (March 7, 2007) (Exhibit US-235).

[253] US FWS, paras. 564-66.

[254], *United States – Countervailing Measures on Certain Products from the European Communities*, WT/DS212/R (adopted 8 January 2003, as modified by the Appellate Body Report, WT/DS212/AB/R).

pay for the value of the subsidy, such that the benefit of the subsidy does not continue to accrue to the purchaser?

211. In its submissions, the United States has made a number of observations in support of its position that the EC has not demonstrated the alleged pass-through of any anticipated future IRB benefits from Spirit to Boeing.[255] For purposes of clarification and as general background to our response to the Panel's question, the United States would like to recall some of those observations. In doing so, we will also address some of the specific arguments presented by the EC in its most recent submission and that we have not previously had a chance to address.

212. As a general matter, the United States has pointed out in its prior submissions that the EC's argument appears to be based solely on a report by its expert Paul Wachtel, who reviews the economics of pass-through under a specific set of economic and market assumptions and without any analysis of the specific facts at issue, or "reasoned economic analysis" (which the EC, in its turn, does expect from the United States). Despite this complete lack of actual analysis, Mr. Wachtel concludes that "there is every reason to believe that Boeing realized the discounted value of the expected subsidies pursuant to the terms and conditions of its sales contract with Onex."[256] In its most recent submission, the EC has now defended that approach by arguing that "{t}he only thing the data would do is make the analysis less transparent, making it harder for the reader to understand what was driving the conclusions. … Since there is no room for data work to change the material conclusions, {Wachtel} correctly does not waste the Panel's time in obscuring the content of his modeling approach with unnecessary numerical analysis."[257] As the United States has shown, however, the pass-through that Mr. Wachtel assumes does not necessarily exist – and indeed, there is evidence it did not. In any event, it depends heavily on the specific circumstances at issue. The EC may find it inconvenient to attempt to apply its economic model to facts that do not support it, but it cannot expect the Panel to find pass-through on the basis of an economic analysis premised on assumptions for which the EC, or its expert, have provided no substantiation whatsoever.

213. The United States has also pointed out that in reality, there was every reason to believe the pass-through alleged by the EC and its expert did not occur *even* under the EC's own theoretical construct. In particular, Mr. Wachtel's conclusions were based on the assumption that "{a}t the time of the transaction, the city of Wichita … {was} *committed* to providing Boeing Wichita and its successor entity, Spirit, continuing subsidies" and that "{t}hese future bond-related benefits *would have been expected* by {Spirit} at the time of sale, *and therefore*

[255] *See* US FWS, paras. 625-36 ; *See also*, US RPQ 47, paras. 126-30; US Comment on EC RPQ 44, paras. 144-149; US Comment on EC RPQ 45, paras. 150-152; US RPQ 255, paras. 436-44; US Comment on EC RPQ 256, paras. 448-49.

[256] Emphasis added.

[257] EC Comment on US RPQ 255, para. 382.

reflected in its terms and conditions."[258] In reality, Spirit had not even applied for IRBs, let alone received authorization or approval for the bonds at the time that the Asset Purchase Agreement between Boeing and Onex was signed in February 2005 and a price agreed for the sale.[259]

214. In this context, the United States also pointed out that in real world commercial interactions, *value* and *price* are not always the same.[260] This is an important point as it underlies both the United States' position in this dispute, and the findings of the Appellate Body in *US – Countervailing Measures on Certain EC Products* to which the Panel's question relates. The United States specifically points the Panel to its explanation in footnote 576 of its responses to the Panel's Questions following the second panel meeting. As we explained there, economic literature specifically recognizes that real-life valuation is not a straightforward exercise and is often highly subjective. For example, valuation results of the same assets may differ depending on the information available to those performing the valuation (information transparency, information (a)symmetry); individual choices made by market actors how to value certain information and what information is relevant; how much weight to give to various elements of the valuation / asset pool; and the full range of assumptions that may go into a valuation (commercial circumstances, sales expectations, future regulatory and tax developments, etc.).[261] Such differences are even more likely with respect to discounted future value, where market participants have to decide on appropriate discount interest rates and risk factors. Beyond such general economic evidence, the United States has also pointed to Boeing's 2005 financial report which indicates that, in fact, Boeing recorded a substantial net loss on the Spirit sale. This confirms that Onex purchased the assets for less than the value that could have been attributed to them.[262]

215. The EC has never engaged on most of the specific factual and economic evidence presented in rebuttal by the United States. In its latest submission, the EC has now even

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[258] US RPQ 255, para. 440, citing Paul Wachtel, Economic Analysis, p. 4 (emphasis added) (Exhibit EC-16).

[259] See US FWS, para. 629; US RPQ 255, para. 440; Asset Purchase Agreement between the Boeing Company and Mid-Western Aircraft Systems Inc. (Feb. 22, 2005) (Exhibit EC-166). As explained in more detail in US FWS, para 629, the City of Wichita stated its intent to issue the IRBs for Spirit in May 2005 and issued the IRBs in December 2006 – ten months after the pricing of the sale was agreed. Even by May 2005, when the City of Wichita issued its Letter of Intent concerning the Spirit IRBs, the actual issuance of the IRBs was still subject to numerous conditions and Wichita assumed no liability in the event that the bonds were not ultimately issued "for any reason".

[260] US RPQ 255, para. 442.

[261] US RPQ 255, para. 441, note 576.

[262] US RPQ 255, para. 441, note 576. The United States also pointed out the difference between the Wichita facilities' sale price ($1.1 billion) and the valuation of those assets as of December 31, 2007 ($ 3.3. billion), which provides further support for a finding that apparently not all future value was included in the price Onex paid for the Wichita facilities.

acknowledged that parties may value the same set of assets differently and that, as a result, price does not necessarily equal value. Specifically, the EC refers to a situation where "two parties are bargaining over an asset. The seller values the asset at $100, and the buyer values the asset at $110. To make both parties happy to trade, the price should lie somewhere between $100 and $110. That is, both parties get some benefit from the trade."[263] While the EC does not say so, this is of course exactly what the United States refers to when it notes that value and price are not always the same and that one cannot, therefore, assume that every element of value is necessarily reflected in the price ultimately agreed, particularly where such an element of value is an alleged potential future value, as opposed to an actual current value.

216. Finally, the United States pointed out in previous submissions that Mr. Wachtel ignores evidence of the elements that *did* play a role in Onex's valuation and how these relate, in terms of magnitude and general relevance, to the alleged subsidy values. Publicly available information indicates that possibilities of renegotiation of union contracts and the growth that Onex believed could be achieved through customer diversification and increased outsourcing were key value drivers for the transaction.[264] While there is clear evidence that such factors played a role in Onex's decision-making and valuation process, there are no indications that the same was true for any alleged future IRB values and, indeed, neither the EC or its expert, Mr. Wachtel, have done anything to even attempt to demonstrate the contrary, on the basis of actual evidence.[265]

217. The reasoning employed by the Panel in *US – Countervailing Measures on Certain EC Products*[266] in no way contradicts these U.S. arguments and, indeed, supports them.

218. As a preliminary matter, it is useful to recall the limited circumstances to which the *US – Countervailing Measures* report actually applies. That report, in the words of both the panel and the Appellate Body which subsequently reviewed it, relates only to the question of continued existence of subsidy benefits following an arm's length, fair market value privatization of all or substantially all the assets of a company and where the original, government, owner retains no controlling stake (subsidy "extinction"). Indeed, the Appellate Body explicitly confirmed that the Panel Report should be read as containing a narrow, fact-specific discussion, rather than general assumptions and more broadly applicable economic theories:

> As we explained, the core legal question before the Panel was to determine whether a benefit, within the meaning of the *SCM Agreement*, continues to exist following privatization at arm's length and for fair market value. In considering this core

[263] EC RPQ 216, para. 389.

[264] US RPQ 255, para. 443.

[265] US RPQ 255, para. 443.

[266] *United States – Countervailing Measures on Certain Products from the European Communities*, WT/DS212/R (adopted 8 January 2003, as modified by the Appellate Body Report, WT/DS212/AB/R).

> legal question, the Panel examined a very precise set of facts and circumstances, namely, a benefit resulting from a prior non-recurring financial contribution bestowed on a state-owned enterprise where, following a privatization at arm's length and for fair market value, the government transfers all or substantially all the property and retains no controlling interest in the privatized producer. The Panel did not examine other situations, for instance, situations where a benefit is conferred through recurring financial contributions, or where the seller retains a controlling interest in the firm following its change in ownership. The Panel had to consider only one kind of change in ownership (that is, a privatization at arm's length and for fair market value where the government transfers all or substantially all the property and retains no controlling interest in the firm) and only one kind of benefit (that is, a benefit originating from a non-recurring financial contribution bestowed to the state-owned enterprise before privatization). The Panel should have confined its findings to those specific circumstances.[267]

219. The sale of Boeing's Wichita facilities to Onex does not fit this fact pattern. That sale was not "a privatization at arm's length and for fair market value where the government transfers all or substantially all the property and retains no controlling interest in the firm". Moreover, the transaction did not relate to the type of benefit to which those findings were limited ("benefit originating from a non-recurring financial contribution bestowed to the state-owned enterprise before privatization"). There is, in other words, no basis to apply the reasoning of the *US – Countervailing Measures* panel – which pertains to the issue of "extinction" of past non-recurring subsidies following privatization of government-owned companies – to the circumstances at hand – alleged pass-through of anticipated future benefits from an unrelated company not itself engaged in the production or sale of the allegedly subsidized product (Spirit) to a company engaged in such activity (Boeing). Indeed, the Appellate Body specifically found that the reasoning of the *US – Countervailing Measures* panel could not be assumed to apply to other fact patterns, including the one at issue here.[268]

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[267] *US – Countervailing Measures on Certain EC Products*, paras 117-118 (footnotes omitted).

[268] The United States notes in this context that it considers that the issue of "pass-through" itself only applies in a very limited set of circumstances. It applies, for example, in the countervailing duty (CVD) context, where the focus is on establishing the precise ad valorem rate of subsidy benefiting the recipient of a subsidy so that an offsetting or "countervailing" duty may be imposed on imports of that recipient's products. In that context, a "pass-through" analysis is typically required where a subsidy is bestowed on a producer of an input product and the question for an investigating authority is the extent to which "subsidies on inputs may be included in the determination of the total amount of subsidies bestowed upon processed products." *US – Softwood Lumber CVD Final* (AB), para. 140. Pass-through also applies in the context of a claim under part III of the SCM Agreement involving a subsidy provided directly to a company that does not make (and is not related to a party that makes) the product alleged to be involved in the causing of adverse effects. In the latter case, it is necessary to show that the alleged subsidy "passed-through" to the producer of the product at issue, thus making that product the "subsidized product" that is causing the relevant adverse effects. *See* SCM Agreement, Arts. 5(c) and 6(3) (describing "serious prejudice" as involving effects relating to a "like product" and a "subsidized product"). It is this latter situation that

220. To the extent that the Panel would nevertheless wish to look at the reasoning of the *US – Countervailing Measures* panel as somehow instructive to the "pass-through" question at issue, the United States notes that the Countervailing Measures' panel's reasoning is, in fact, supportive of the "no pass-through" argument laid out by the United States. First, the economic reasoning of the panel in *US – Countervailing Measures* – as reflected in paragraph 7.65 and footnote 333 referred to by the Panel is premised on the explicit assumption *that the alleged benefit is fully reflected in the balance sheet* of the company that is privatized. Thus, footnote 333 in particular, states that:

> The economic reasoning behind this is that the subsidy bestowed to the state-owned producer will necessarily be reflected in the balance sheet of the state-owned producer. Following privatization (where ownership shifts from the public to the private sector), the sale price paid for the assets and shares of the state-owned producer will include a valuation of the advantage brought by the financial contribution, i.e., the benefit pursuant to the SCM Agreement. As we will elaborate further below, when this valuation reflects market conditions, the benefit would be extinguished, since it has been fully paid for.

221. As the United States has demonstrated previously, it is not at all clear that this was the case with respect to the alleged subsidies to which the EC's pass-through claim pertains. As discussed in prior U.S. submissions, the benefit pass-through alleged by the EC and the EC's economist, Paul Wachtel, relates to potential future benefits, not actual past benefits.[269] Whether such potential future cash flows are reflected in the valuation of a company's assets (as valued by the purchaser), whether such value is actually reflected in the price the future owner pays for those assets, and to what extent, are all far from certain. Indeed, the findings of the panel and the Appellate Body in *US – Countervailing Measures* are all premised on past subsidies. In contrast, the alleged subsidies that are part of the EC's claim relate to potential future subsidies for which it is not at all certain that they would be received by Spirit, nor whether they were "necessarily reflected" in the balance sheet of Boeing's Wichita facilities, or Onex's valuation of those facilities, or the price it ultimately agreed to pay. Other factors, such as information asymmetries, negotiating dynamics and the actual differences shown to exist between the valuation of the Wichita facilities on Boeing's balance sheets and the price paid for them by Onex further support this conclusion.[270]

222. Second, even if the potential future value of alleged benefits were somehow reflected in the balance sheet of Boeing's Wichita facilities, this does not necessarily imply that such value is also reflected in the price paid for those assets. The United States previously explained the

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applies to the alleged subsidization of Boeing LCA through Spirit, an unrelated company not itself producing the product that is allegedly causing adverse effects.

[269] US FWS, paras. 625-36; US RPQ 255, paras. 436-44.

[270] US RPQ 255, paras. 436-44; USFWS, paras. 625-36.

economics of this by pointing to negotiating dynamics, information asymmetries and other valuation difficulties that exist in the market, and the profit maximizing nature of market participants.[271] As discussed above, the EC itself now also appears to have acknowledged this economic reality. Indeed, even in the specific context of extinction of a prior subsidy through the arm's length and fair-market value privatization of all or substantially all of the assets of a previously government-owned firm, the *US – Countervailing Measures* Appellate Body explicitly rejected the suggestion from the panel that an irrebuttable presumption of such extinction would exist:

> {W}e find that the Panel erred in concluding that '{p}rivatizations at arm's length and for fair market value *must* lead to the conclusion that the privatized producer paid for what he got and thus did not get any benefit or advantage from the prior financial contribution bestowed upon the state-owned producer.' (emphasis added) Privatization at arm's length and for fair market value *may* result in extinguishing the benefit. Indeed, we find that there is a rebuttable presumption that a benefit ceases to exist after such a privatization. Nevertheless, it does not *necessarily* do so. There is no inflexible rule *requiring* that investigating authorities, in future cases, *automatically* determine that a 'benefit' derived from pre-privatization financial contributions expires following privatization at arm's length and for fair market value.[272]

223. Thus, even if the Panel were to extend the presumption of extinction of past subsidies in the case of an arm's length, fair market value privatization to a situation of alleged pass-through of potential future benefits, such a presumption would be "rebuttable" and not "irrebuttable". The detailed economic and factual evidence outlined in previous submissions, has rebutted the EC allegations of pass-through and, indeed, the EC itself has now acknowledged that the value of assets is not necessarily passed-through.[273]

368. In relation to the Illinois EDGE Tax Credits, the United States argues that "since Boeing cannot yet claim its 2007 to 2017 EDGE tax credits, the benefit to Boeing of any future tax credits remains speculative". (US First Written Submission, para. 669) Similarly, in relation to the Illinois property tax abatements, the United States submits that "any future local property tax abatements that Boeing may receive are too speculative to be counted as a benefit to Boeing". (US First Written Submission, para. 679) Finally, the United States argues that any reimbursement Boeing may receive between 2007 and 2011 under the Illinois Corporate Relocation Program "remains speculative". (US First Written Submission, para. 663) Does the United States make these arguments to challenge the

[271] US RPQ 255, paras. 436-44.

[272] *US – Countervailing Measures* (AB), para. 127 (footnotes omitted).

[273] *See* EC RPQ 216, para. 389.

existence of the alleged subsidies under Article 1.1 of the SCM Agreement or to challenge the European Communities' quantification of the alleged subsidies?

224. The United States refers to the speculative nature of these tax credits, abatements, and reimbursements to challenge the EC's quantification of the alleged subsidies.

369. Did Boeing receive any FSC benefits after 31 December 2006?

225. No, Boeing did not receive any FSC benefits after December 31, 2006.[274]

III. ADVERSE EFFECTS

370. The Panel invites the parties to submit comments, if any, on the Appellate Body Report in US – Upland Cotton (Art. 21.5 – Brazil) circulated to WTO Members on 2 June 2008, and the Panel Report as modified by the Appellate Body Report. The Panel is interested in the comments of the parties to the extent that the parties deem the Appellate Body Report and the Panel Report as modified by the Appellate Body Report to be pertinent to the present dispute. Without limiting the scope of the foregoing, the Panel is interested in receiving the parties' comments on the extent to which the Appellate Body Report and the Panel Report as modified by the Appellate Body Report are pertinent to the following issues:

226. The United States will first address the two specific questions posed by the Panel, and then adds subsections (c), (d), and (e) to address other areas in which the *US—Upland Cotton* report is pertinent to this dispute.

(a) the appropriateness of adopting a "unitary" analysis in respect of identifying each of the following: price suppression and its causes, lost sales and its causes, displacement or impedance of imports and its causes, and displacement or impedance of exports and its causes;

227. The Appellate Body in *US – Cotton Subsidies (21.5)* noted that, in light of the "counterfactual nature" of price suppression, "the Panel's 'unitary analysis,' at least in respect of identifying price suppression and its causes, has a sound conceptual foundation."[275] The Appellate Body called for quantitative and qualitative assessments of the effects of subsidies and a clear explanation of how they support a finding as to the significance of price suppression. The Appellate Body further found that on the quantitative side, a Panel should "examine" any economic models proposed and the parameters used by each party, and explain its conclusion.[276] On the qualitative side, a Panel should evaluate the structure, design, and operation of any

[274] Statement of James H. Zrust (Exhibit US-1341).

[275] *US – Cotton Subsidies (21.5) (AB)*, para. 354.

[276] *US – Cotton Subsidies (21.5) (AB)*, para. 358.

alleged subsidies, and again provide a "clear explanation."[277] As the United States demonstrated in prior submissions and discusses further below, the EC's attempts to show quantitatively that the alleged subsidies cause adverse effects do not withstand examination, and the only "clear explanation" of the structure, design, and operation of the alleged subsidies is that they had no effect on Boeing's aircraft pricing or development.[278]

228. The Appellate Body also emphasized that "Article 6.3(c) requires the Panel to have ensured that the effects of other factors on prices did not dilute the 'genuine and substantial' link between the subsidies and the price suppression."[279] The Appellate Body noted that a panel has "flexibility" in how it performs this assessment, and may either take account of the effects of other factors as part of its counterfactual analysis or perform a separate analysis.[280]

229. The Appellate Body made these findings in the context of an examination of price suppression. However, they provide guidance for the analysis of lost sales and displacement/impedance. Most importantly, the Appellate Body's conclusions regarding the causation standard and the need to consider factors other than the alleged subsidies arise from the presence of "effect of" in Article 6.3(c):

> We agree that Article 6.3(c) requires the establishment of a causal link, but we observe that, while the term "cause" focuses on the factors that may trigger a certain event, the term "effect of" focuses on the results of that event. The effect – price suppression – must result from a chain of causation that is linked to the impugned subsidy.[281]

That phrase "the effect of the subsidy" also applies to "lost sales" under Article 6.3(c), and appears in the Article 6.3(a) and (b) standards for identifying displacement and impedance, which means that the Appellate Body's conclusions as to the analysis of causation for price suppression would similarly apply to lost sales, displacement, and impedance. These include the

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[277] *US – Cotton Subsidies (21.5) (AB)*, para. 361.

[278] US FWS, paras. 733-790, 810-873, and 916-1189; US SWS, paras. 159-223; US RPQ 90, paras. 226-227; US RPQ 92, paras. 231-236; US Comments on EC RPQ 84, paras. 285; US Comments on EC RPQ 88, paras. 298-308, US Comments on EC RPQ 87, paras. 323-336, US Comments on EC RPQ 89, paras. 345-347; US RPQ 286, paras. 497-503; US RPQ 295, para. 504; US Comments on EC RPQ 275, paras. 480-487, US Comments on EC RPQ 279, para. 503, US Comments on EC RPQ 285, paras. 513-517; US Comments on EC RPQ 286, paras. 520-521, US Comments on EC RPQ 289, pars. 538-540; US Comments on EC RPQ291, paras. 553-556; US Comments on EC RPQ 292, paras. 586-587, US Comments on EC RPQ 301, paras. 598-603.

[279] *US – Cotton Subsidies (21.5) (AB)*, para. 375.

[280] *US – Cotton Subsidies (21.5) (AB)*, para. 375.

[281] *US – Cotton Subsidies (21.5) (AB)*, para. 374.

finding that the text "leaves some discretion to panels in choosing the methodology used for this assessment."[282]

230. The Appellate Body found that Articles 5(c) and 6.3(c) of the SCM Agreement "do not exclude" use of a "but for" approach to examine whether price suppression was the "effect" of a subsidy. The Appellate Body's approbation of a "but for" analysis would apply also to evaluating lost sales and displacement and impedance of imports or exports as indicia of serious prejudice, as all are essentially counterfactual in nature. A lost sale is one in which the effect of the subsidy is that the subsidized product obtains a sale that the complaining Member's product otherwise would have gotten. [283] Displacement and impedance exists when the subsidized product takes market share that the complaining Member's product would have taken.[284] Similarly, lost sales and displacement and impedance may both have quantitative and qualitative aspects, which will lend them to quantitative and qualitative assessments, although potentially based on different factors than would apply for price suppression.

231. In considering the relevance of the Appellate Body's discussion of a unitary analysis, the critical point is that the requisite "genuine and substantial" link between the alleged subsidies and any serious prejudice does not exist if the Panel fails to "ensure{} that the effects of other factors . . . did not dilute the 'genuine and substantial' link between the subsidies" and the alleged serious prejudice.[285] The EC concedes that a "non-attribution" analysis of non-subsidy factors "is a fundamental part of the 'unitary' approach to causation."[286] However, as the United States has shown, such an analysis is fatal to the EC's serious prejudice claims.[287]

> *(b) the appropriate standard for assessing whether "but for" the subsidies, the serious prejudice in question (i.e., significant price suppression, significant lost sales, displacement or impedance of imports and displacement and impedance of exports) would not have occurred.*

232. The Appellate Body in *US – Cotton Subsidies (21.5)* did not purport to develop a methodology or standard for a "but for" causation test for purposes of Article 6.3(c) of the SCM Agreement. Instead, it stressed that "the 'but for' test should determine that price suppression is the effect of the subsidy and that there is a 'genuine and substantial relationship of cause and effect'" between the two.[288] The Appellate Body found that there is a "sound conceptual

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[282] *US – Cotton Subsidies (21.5) (AB)*, para. 375.

[283] US FWS, paras. 892-893.

[284] US FWS, para. 900.

[285] *US – Cotton Subsidies (21.5) (AB)*, para. 375.

[286] EC RPQ 287, para. 581.

[287] US Comments on EC RQ 287, paras. 522-533.

[288] *US – Cotton Subsidies (21.5) (AB)*, para. 374, *quoting US – Wheat Gluten (AB)*, para. 69.

foundation" for a unitary approach that does not "separate price suppression from its causes."[289] At the same time, it recognized that Article 6.3(c) "requires the Panel to have ensured that the effects of other factors on prices did not dilute the 'genuine and substantial link between subsides and the price suppression."[290] The Appellate Body found that a panel satisfies this requirement when it considers the evidence before it and concludes that other factors do not "diminish the significance of the impact" of the alleged subsidies.[291]

233. Although the Appellate Body did not enunciate a standard, it found the panel's analysis to be consistent with Article 11 of the DSU and Article 6.3(c) of the SCM Agreement. The panel explained that it was evaluating each element of Brazil's claim of significant price suppression: whether the U.S. production and exports had a "substantial proportionate influence" in the world market; the structure, design and operation of the subsidies; whether the magnitude of the subsidies was "high" in relation to the value of the product; whether there was a link between subsidization and production levels; whether there was a "discernible temporal coincidence" of price suppression and subsidies; the size and significance of the gap between U.S. producers' production costs and market revenues; and an economic simulation model submitted by Brazil. The Appellate Body found that

> the Panel considered both quantitative and qualitative elements in its assessment. It made a quantitative assessment of significance by evaluating the magnitude of the subsidies, the gap between United States upland cotton producers' revenues and costs of production, the United States' share of world production and exports, and the economic simulations, and it made a qualitative assessment by evaluating the structure, design, and operation of the subsidies.[292]

The dispute involved only one potential other factor causing serious prejudice that required a non-attribution analysis, and the Appellate Body concluded that evidence as to that factor's effect on price suppression was "inconclusive."[293] Accordingly, it found that the panel complied with Article 6.3(c) of the SCM Agreement by providing an analysis demonstrating that the other factor had no effect.

234. Thus, one way for a panel to comply with Article 11 of the DSU in applying Article 6.3(c) is to perform an adequate assessment of each element of the complaining party's case, analyzing the quantitative and qualitative aspects of the complaining party's arguments regarding the alleged effects of any subsidies found to exist. In so doing, a panel must consider whether factors other than subsidization dilute, or disprove, the alleged link between the subsidies and the

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[289] *US – Cotton Subsidies (21.5) (AB)*, para. 354.

[290] *US – Cotton Subsidies (21.5) (AB)*, para. 375.

[291] *US – Cotton Subsidies (21.5) (AB)*, para. 381.

[292] *US – Cotton Subsidies (21.5) (AB)*, para. 361.

[293] *US – Cotton Subsidies (21.5) (AB)*, paras. 376 and 378.

alleged serious prejudice, although a panel has discretion to conduct that non-attribution inquiry as part of a unitary analysis or as a separate analytical step.[294]

(c) The use of estimates

235. In *US – Cotton Subsidies (21.5)*, the Appellate Body emphasized if the parties present divergent quantitative evidence, the panel must either "reconcile these discrepancies" or "{i}f this was not possible . . . provide{} a reasoned explanation as to why it preferred one category of quantitative evidence over the other."[295] The Appellate Body also reiterated its admonition that a panel may not "apply{y} a double standard of proof,"[296] which it described in *Korea – Alcoholic Beverages* report as "one standard, relaxed and permissive, for the complainants, and another, very strict and demanding, for the defending party."[297]

236. Such a double standard is precisely what the EC seeks in this dispute. It asks the Panel to accept without question estimates the EC derived by applying a number of dubious assumptions to NASA and DoD budgets (*e.g.*, that 80-90 percent of the research funds paid to entities other than Boeing constituted "funding" of Boeing). It then insists that the Panel reject estimates derived by NASA based on data showing actual payments from NASA to Boeing, unless the United States submits even greater volumes of back-up documentation than it has already submitted.[298]

237. This is not the approach that the Appellate Body advocated in *US – Cotton Subsidies (21.5)*. Although the United States and Brazil used different government U.S. data sets to estimate the whether an export insurance program would cover its costs, the Appellate Body did not suggest that the panel should have rejected the data relied upon by the United States, or requested additional documentation to "validate" the data. It found instead that the panel should have explained why it could rely on one estimate over the other.[299]

238. The Appellate Body's focus on the reliability of the various estimates put forward by the parties in the *US – Cotton Subsidies (21.5)* proceeding also provides useful guidance in this dispute. The evidence before the Panel establishes that the U.S. estimates are reliable. The NASA estimate relied on NASA's identification of contracts with Boeing related to the eight programs challenged by the EC, and the actual amounts disbursed under each contract.[300] This

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[294] *US – Cotton Subsidies (21.5) (AB)*, para. 375.

[295] *US – Cotton Subsidies (21.5)*, para. 292.

[296] *US – Cotton Subsidies (21.5)*, para. 293, *quoting Korea – Alcoholic Beverages*, para. 164.

[297] *Korea – Alcoholic Beverages*, para. 163.

[298] *E.g.*, EC RPQ 171, paras. 293-294.

[299] *US – Cotton Subsidies (21.5) (AB)*, paras. 294-295.

[300] NASA estimated disbursements to Boeing under one program, ACEE, which was so old that NASA no longer had company-specific disbursement data. US FWS, para. 212, note 305.

process indicated that NASA's contracts with Boeing for aeronautics research challenged by the EC amounts to only $715 million.[301] The United States documented this estimate by submitting copies of all contracts so identified.[302] At the Panel's request, NASA verified its estimate by relating the value of aeronautics research contracts with Boeing to the value of all NASA procurement contracts with Boeing, as reported each year in the NASA Procurement Reports.[303] NASA identified all contracts between Boeing and one of the aeronautics research centers, and then evaluated the description of research under each contract to determine which ones related to research challenged by the EC. It resolved all questions in favor of the EC. This over-inclusive standard demonstrated that NASA paid Boeing *at the very most* $775 million from 1989 to 2006 for research covered by the EC claims.[304] The contracts submitted as evidence to the Panel cover the vast majority of these transactions, and further verify the accuracy of NASA's estimate.[305]

239. The United States also demonstrated that any provision of facilities, equipment, or employees alleged by the EC would have been covered by Space Act Agreements, and that the total value of such agreements funded under the programs challenged by the EC was approximately $75 million.[306] The EC argued that the United States incorrectly omitted certain agreements from this calculation. The United States showed that the omission of the agreements in question was correct and, in any event, did not materially change the results.[307] The United States demonstrated that the EC had provided no evidence to support its allegations that NASA provided facilities, equipment, or employees to Boeing through other means.[308]

240. In contrast, the evidence shows that the EC estimates are unreliable. In the first place, the EC recognizes that its estimate of the value of NASA's LCA-related research includes research that the EC itself concedes should be excluded – engines, air traffic management, and hypersonic flight.[309] The EC attempts to minimize this problem as being restricted to a few programs.[310]

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[301] US FWS, para. 212.

[302] See NASA Contract List (Exhibit US-1245).

[303] US RPQ 188, paras. 215-225.

[304] US RPQ 188, para. 225.

[305] US RPQ 188, para. 225.

[306] Exhibit US-1256(revised).

[307] U.S. Comments on EC RPQ 172, paras. 300-303.

[308] U.S. Comments on EC RPQ 171, para. 294.

[309] EC Comments on US RPQ 176, paras. 163-164. Although the EC has recognized since its first written submission that research into hypersonic flight should be *ex*cluded (Exhibit EC-25, p. 19, columns (d) and (f)) it attempts in its comments to assert the opposite. EC Comments on US RPQ 176, para. 165. The Panel should disregard this assertion, as the sources cited by the EC do not support any relationship between hypersonic research and civil aircraft. The EC's consultants, CRA, actually concede that hypersonic flight is *not* relevant to large civil aircraft. Exhibit EC-1176, p. 29 ("High temperature airframe structures would generally be more important in high supersonic, or hypersonic aircraft, for instance. The funding in this case was therefore excluded from the CRA

However, the numerous examples from the R&T Base Program – the largest program challenged by the EC and the one with the most detailed public information – only serve to demonstrate the folly in the EC's "top-down" approach. NASA research generally applies far beyond Boeing and the U.S. civil aircraft industry.[311] In extracting only those portions of programs that explicitly apply to specific non-LCA topics, the EC by necessity leaves behind significant amounts that it concedes have no place in this dispute. [312] This error by itself invalidates its calculations from the outset.

241. Second, even though the EC makes separate allegations regarding alleged "provisions of funds" to Boeing and provision of "facilities, equipment, and employees," it treats the two separate types of alleged financial contribution as an indistinguished mass for valuation purposes.[313] However, as the evaluation of the benefit differs for these separate financial contributions, the EC's failure to treat them separately makes it impossible for the Panel to analyze those figures.

242. Third, and most problematic, the EC's calculations rest on an assumption – that the NASA research challenged by the EC is of use exclusively to the U.S. civil aircraft industry, as defined by the EC.[314] The EC provides only one argument in support of this assumption – that "the purpose of the programmes at issue was to enhance the ability of the US civil aircraft industry, most notably Boeing's LCA division, to build better civil aircraft, and thereby better compete with Airbus."[315] This is both untrue and irrelevant. The eight NASA programs challenged by the EC had a number of objectives, most of them unrelated to enhancing the competitiveness of the civil aircraft industry. The sources that the EC cites to argue that competitiveness was "the purpose" do not, in fact, support that conclusion.[316] In any event, the "purpose" of a financial contribution is irrelevant to determining whether it confers a benefit or

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analysis.") The Statement of Patrick Gavin, *et al.*, the other source cited by the EC, does not even mention hypersonic flight. Statement of Patrick Gavin, *et al.* (Exhibit EC-1175) (HSBI).

[310] EC Comments on US RPQ 176, paras. 163-167.

[311] The U.S. response to Question 343 discusses this point in greater detail.

[312] The EC asserts that the United States bears the burden of identifying "the *amounts* NASA spent toward these allegedly non-LCA-related topics" so as "to exclude any further amounts from the EC estimates." EC Comments on US RPQ 176, paras. 163-167. This is incorrect, as it is the *EC* that bears the burden of proving the subsidy value it alleges. Moreover, the United States has demonstrated, based on the evidence, the minimum amounts to subtract from NASA's expenditures to determine how much money Boeing received pursuant to NASA contracts. US RPQ 188, paras. 215-225.

[313] EC RPQ 163(c), para. 249 ("the EC estimates reflect the *total support* provided by NASA (*i.e.*, both direct transfers of funds *and* provisions of goods and services) to Boeing's LCA division through the programmes at issue.").

[314] EC RPQ 163(c), paras. 249-250.

[315] EC RPQ 163(c), para. 250.

[316] US OS2, paras. 34-43; US Comments on EC RPQ 163(g), para. 248.

the value of any such benefit,[317] which depends on the extent to which the government made the contribution on terms more favorable than were available in the market.[318] The critical point is that the evidence shows that enterprises outside the civil aircraft industry and outside the United States used NASA research.[319] Thus, the EC assumption that the entirety of NASA's aeronautics activities may be treated as payments or the provision of facilities, equipment, or employees to the U.S. civil aircraft industry is contrary to the evidence.

243. Finally, unlike Brazil in *US – Cotton Subsidies*, the EC has submitted *no* other data that would support its assertion that NASA paid money and conferred facilities, equipment, and employees to NASA worth billions of dollars. In short, the evidence in this dispute points in one direction – that NASA's alleged payment of funds to Boeing (and any benefit conferred by those payments challenged by the EC) was less than $1 billion.

(d) The analysis of threat of serious prejudice

244. In *US – Cotton Subsidies (21.5)*, Brazil, like the EC in this dispute, made claims of both serious prejudice and threat of serious prejudice. As the panel found the existence of serious prejudice, it saw no need to make a further finding as to threat of serious prejudice.[320] In evaluating the consequences of this decision, the Appellate Body reasoned that:

> a claim of serious prejudice may relate to a different situation than a claim of threat of serious prejudice. A claim of present serious prejudice relates to the existence of prejudice in the past, and present, and that may continue in the future. By contrast, a claim of threat of serious prejudice relates to prejudice that does not yet exist, but is imminent such that it will materialize in the near future. Therefore, a threat of serious prejudice claim does not necessarily capture and provide a remedy with respect to the same scenario as a claim of present serious prejudice.[321]

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[317] In *Korea – Shipbuilding*, the Panel reached a similar conclusion, finding that:

> the question we must answer is whether or not the PSL programme requires {the government} to provide prohibited export subsidies. The intent behind the PSL programme is not relevant to this issue.

Korea – Shipbuilding, para. 7.128.

[318] *Canada – Aircraft (AB)*, para. 158. US Comments on EC RPQ2, paras. 198, 249, and 399.

[319] US FWS, para. 193; US RPQ 159, para. 148; *List of OVERFLOW Users* (Exhibit US-1270); *List of publications based on work performed in the Integrated Wing Design ("IWD") project* (Exhibit US-1140(revised)); *Reports and articles published by Boeing/McDonnell personnel pursuant to aeronautics research contracts* (Exhibit US-1253).

[320] *US – Cotton Subsidies (21.5)(AB)*, para. 329, note 692.

[321] *US – Cotton Subsidies (21.5)(AB)*, para. 244 (citation omitted).

The EC's request that the Panel reach a finding as to threat of serious prejudice based on the same facts and same arguments as the EC's claim of serious prejudice ignores the differences between the two. Therefore, the Panel should reject the EC's request.

245. The Panel should also note the Appellate Body's guidance that threat of serious prejudice "relates to prejudice that does not yet exist, but is imminent." Thus, the threat must exist, and the serious prejudice that is "threatened" must be imminent. This finding unreservedly rejects the view, advocated by the EC in this dispute, that "Part III of the *SCM Agreement* does not require that the threat {of serious prejudice} be 'imminent.'"[322]

(e) Significance of the Appellate Body's insistence on a detailed examination of the evidence related to a serious prejudice claim

246. An important aspect of the Appellate Body Report is the emphasis it places on the obligation of a panel to evaluate and compare the arguments of the parties and to "clearly explain{} its position" on the issues.[323] In this dispute, a unitary, "but for" analysis of the EC's serious prejudice arguments places on the EC the burden of proving that:

- as a direct consequence of the magnitude and nature of the alleged subsidies, Boeing's large civil aircraft pricing and/or product development decisions were different from what they otherwise would have been; and

- as a direct consequence of the difference in Boeing's large civil aircraft pricing and/or product development decisions attributable to the magnitude and nature of the alleged subsidies, the prices Airbus could command for the A320, A330, A350 Original and/or the A340 were significantly suppressed, Airbus lost significant sales of those aircraft, and/or Airbus' exports of those aircraft were displaced or impeded.

247. Moreover, the evidence needed to sustain a "but for" serious prejudice claim under a unitary method of analysis must prove (1) a genuine and substantial link between the effects of the alleged subsidies and, through their impact on Boeing's behavior, one or more forms of alleged serious prejudice to Airbus; and (2) that the alleged indicia of serious prejudice to Airbus are not a consequence of factors other than the alleged subsidies. For the reasons explained below, the assertions that the EC relies on for its "effects-of-the-alleged-subsidies" claim falls far short of the quantitative and qualitative evidence needed to meet this test.

248. In this proceeding, the EC has presented three iterations of its "but for" causation argument – (1) the Cabral Report, (2) the magnitude-of-the-subsidies calculation, and (3) an analysis of Boeing's financial data that attempts to show that "but for" the alleged subsidies,

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[322] EC RPQ 311, para. 817

[323] *E.g., US – Cotton Subsidies (21.5) (AB)*, paras. 357 and 361.

Boeing would not have had the financial means to develop and price its aircraft as it did. None of the three withstands careful examination.

249. The United States has already discussed in detail the flaws of the Cabral model. To summarize:

- The Cabral Report depends on the EC's greatly exaggerated calculation of the amount of the alleged subsidies;[324/]
- It relies on the assumption that Boeing's investment decisions vary with incremental non-operating cash,[325] which is at odds with Boeing's unfettered access to capital markets;
- It assumes that Boeing uses its free cash for only three purposes – to invest in "aggressive pricing," product R&D, and payments to shareholders – when the evidence establishes that Boeing has a number of other options, such as acquisitions and payments to pension plans;
- The Cabral model further assumes that Boeing allocates free cash among investment options in fixed proportions, when the evidence establishes that the attractiveness of different investment options differs over time, and that Boeing changes investment allocations accordingly; and
- It assumes contrary to the evidence that a significant portion of Boeing's 2000-2006 sales involved significant switching cost and learning cost incentives to lower price.[326]

These errors are foundational, and hard-wired into the model. No tinkering with parameters or adjustments to equations can correct them.

250. When a party offers as evidence the results of a model of economic behavior, a panel bears the duty to evaluate all the evidence and assess its weight and credibility, which in turn requires an examination of the structure of the model and the validity of each of the assumptions that drive its conclusions. For example, the panel in *US – Cotton Subsidies (21.5)* factored the results of the modeling exercises submitted by Brazil and the United States into its analysis, but only after a close examination of the model and its operating assumptions. By contrast, where, as in this dispute, a model suffers from fundamental structural defects and depends on

[324] Prof. Cabral also accepts as given the EC's unsupported assertion that the alleged subsidies are the equivalent of cash payments to Boeing. Cabral Report, paras. 13-14 (Exhibit EC-4).

[325] US FWS, 832-839; US SWS, para. 181; US RPQ 90, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3).

[326] EC FWS, paras. 1396-1399 (A330); 1501-1503 (A320); and 1597-1599 (A340)

demonstrably inaccurate assumptions, a panel cannot properly accept its conclusions as reliable evidence.

251. In its first written submission, the EC also presented a quantitative analysis adding the per aircraft subsidy values calculated by ITR to the average prices for the Airbus aircraft that the EC identified as competitive. The EC then contended that the results were "counterfactual family prices" for the Airbus aircraft.[327] But this would be true only if each dollar of the alleged subsidies resulted in a $1 decrease in the prices charged by Boeing, and if every dollar of change in Boeing's prices resulted in an identical change in Airbus' prices. The EC has presented no evidence to support either proposition.[328]

252. By contrast, the United States has provided evidence that Boeing always attempts to maximize its profits over time and, therefore, prices its aircraft without regard to any alleged subsidies.[329] There is, then, no basis on which the Panel can reasonably conclude that each dollar of the alleged subsidies would result in an equivalent decrease in Boeing's prices, or that changes in Boeing's prices translate into dollar-for-dollar changes in Airbus prices. Like the Cabral Report, the EC, in relying on its counterfactual Airbus aircraft prices, assumes its conclusions instead of proving them by reference to evidence.

253. The EC's final arguments regarding the quantitative effect of the alleged subsidies purports to make a "but for" demonstration that "absent the subsidies, {Boeing} would need to charge higher prices and slow product development."[330] In contrast to the situation in *U.S.-Cotton (Art. 21.5)*, however, there is no evidence that Boeing needed the alleged subsidies to close a "significant" gap between the costs and revenues of its large civil aircraft operations.[331] To the contrary, the EC's claim is not that "but for" the alleged subsidies Boeing would have lost money on its reference period sales, but that its returns would have been insufficient to justify its 2004-2006 "investment" in large civil aircraft product development and pricing that allegedly harmed Airbus from 2004 to 2006. But because product development and pricing decisions in that period led to a significant led to a significant improvement in the profitability of Boeing's large civil aircraft operations by 2006,[332] the evidence contradicts the EC argument.

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[327] *E.g.*, EC FWS, para. 1501 (A320).

[328] To the contrary, even the Cabral Report, ill-conceived as it is, contradicts the EC's "dollar-for-dollar" price effect contention by assuming that Boeing would spend some of its funds on things other than price reductions. *See* Cabral Report, paras. 82, 84 (Exhibit EC-4).

[329] US Comments on EC RPQ 84, paras. 292-293; US Comments on EC RPQ 287, para. 526; US Comments on EC RPQ 291, para. 547.

[330] EC Comments on US RPQ 295, para. 496, first bullet.

[331] *Cf. US – Cotton Subsidies (21.5)(AB)*, para. 363.

[332] ITR Economic Viability Report, Table 2.b, Line G (Exhibit EC-1393)

254. Beyond the point of the sharp increase in Boeing's post-2003 profitability, the United States has also demonstrated that over the full 1989-2006 period analyzed by the EC, Boeing had more than sufficient resources to support its product development and pricing decisions even if its aggregate income for those years had been reduced by the full amount of the EC's subsidy allegation.[333] The first step in assessing the effect of the alleged subsidies on Boeing's ability to price the 787, 737, and 777 as it did, and to develop the 787 as it did, is to calculate the amount of the alleged subsidies correctly.

255. Because the starting point of the EC's argument is a greatly exaggerated $19.1 billion amount-of-the-subsidies allegation, the rest of the EC's argument about Boeing's viability in the large civil aircraft market, weak as it is, rests on an incorrect premise. However they may be labeled, most of the money challenged by the EC consists, in fact, of NASA's payments to other contractors and the activities of NASA personnel, who, among other things, publish the results of their own research for public dissemination, conduct work useful to the government, and maintain NASA's library of aeronautics research for public use. There is no evidentiary support for the EC's contention that there is a subsidy to Boeing because of payments to companies or institutions other than Boeing, each of which has interests different from Boeing's, and several of which supply Airbus. And beyond the indefensibility of attributing to Boeing 80-90 percent of NASA's payments to others, the EC has provided no evidence that Boeing would have undertaken any of the NASA-funded programs on its own, much less do so at the same funding levels as NASA.

256. The next step in assessing the EC claim that, "but for" the alleged subsidies, Boeing would have had to charge higher prices and slow its product development is to examine the relevant counterfactual -- If the alleged subsidies (correctly calculated) had been unavailable, would Boeing have had the financial resources and willingness to develop and price its large civil aircraft as it did?

257. There can be no question as to the willingness. The sharp increase in BCA's operating profits between 2004 and 2006[334] demonstrate its strong incentive to undertake the product development and pricing decisions that made the increase possible. To answer the question as to Boeing's financial resources, the Panel can compare the after-tax operating income on Boeing's large civil aircraft operations, reduced by any subsidies the Panel may find, to the cost of capital used to support those operations. The data are unambiguous: Boeing's economic profit over the 1989-2006 period on its large civil aircraft sales has been above the weighted average cost of the

[333] US Comments on EC RPQ 292, paras. 580-584; Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit 1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit 1359).

[334] ITR Economic Viability Report, Table 2.b, Line G (Exhibit EC-1393).

invested capital needed to support those sales.[335] To be sure, the profitability of Boeing's LCA operations suffered significantly over the period 2003-2005, when the impact of Boeing's market share losses to Airbus were coupled with weak demand, but the depressed return on invested assets in those years was more than offset by solid returns in other years. [336]

258. The details of a return on invested capital ("ROIC") or economic profit/economic value-added ("EVA") calculation raise some issues on which experts may differ. However, there is broad consensus that (1) the proper measure of a company's *historic* performance is its ROIC compared to its weighted average cost of capital ("WACC") or economic profit/EVA,[337] and (2) the capital invested in a business segment should *not* be calculated by including excess cash, which, by definition, is not used to finance the business.[338]

259. The EC's effort to portray Boeing's large civil aircraft operations in absence of the alleged subsidies as "value destroying" makes the critical error of comparing BCA's return on its gross assets to its cost of capital, (rather than compare its return on capital invested in the business to its cost of capital).[339] The EC compounds this very basic error by allocating to BCA a portion of the cash which was an asset held at Boeing's corporate headquarters and which was not used to support BCA's operations.[340]

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[335] US Comments on EC RPQ 292, paras. 580-584; Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit 1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit 1359).

[336] ITR Economic Viability Report, Table 2.b, Line G (Exhibit EC-1393).

[337] Both ROIC/WACC and economic profit/EVA are calculated using after-tax operating profit, invested capital, and WACC. However, ROIC/WACC results in ratios, while economic profit/EVA result in an absolute dollar value. Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit 1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit 1359).

[338] Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Koller, Goedhart, and Wessels, Valuation: Measuring and Managing the Value of Companies (McKinsey & Co., 4th ed. 2005), p. 171 (Exhibit US-1360); Jason L. Wolin and Steven Klopukh, *Integrating EVA into the Portfolio Management Process*, in Value-Based Metrics: Foundations and Practice, p. 148 (Frank Fabozzi and James Grant eds., 2000) (Exhibit US-1361)); Aswath Damodaran, *Return on Capital (ROC), Return on Invested Capital (ROIC), and Return on Equity (ROE): Measurement and Implications* 9-10 (Exhibit US-1362).

[339] US Comments on EC RPQ 292, paras. 574-579.

[340] *Compare* ITR Economic Viability Report at para. 9, Table 1.b (Exhibit EC-1393) (allocating corporate-level assets, including cash, to BCA), *with* US Comments on EC RPQ 292, para. 579; Statement of Ruud Roggekamp, para. 3 (Exhibit US-1321) (explaining that, when Boeing measures BCA's economic profitability, "cash is excluded from net assets because the business unit does not control the deployment of such cash among opportunities as share repurchase, dividend, etc."). *See also* Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Koller, Goedhart, and Wessels, Valuation: Measuring and Managing the Value of Companies (McKinsey & Co., 4th ed. 2005), p. 171 (Exhibit US-1360); Jason L. Wolin and Steven Klopukh, *Integrating EVA into the Portfolio Management Process*, in Value-

260. When BCA's reference period ROIC and EVA are calculated correctly, the calculations show that *even accepting the EC's subsidy calculation as accurate and deducting the full amount of FSC and non-recurring subsidies alleged by the EC from BCA's operating income, Boeing's large civil aircraft operations still show a positive ROIC and EVA*.[341]

261. Thus, when the EC argues that "{w}ithout these subsidies, Boeing would need to finance these investments itself,"[342] the response is that the evidence demonstrates that, during the reference period, Boeing did, in fact, self-finance all the investment related to large civil aircraft that it considered worthwhile. And when the EC goes on to argue that, but for the alleged subsidies, Boeing would have had to "change its pricing and product development behavior to restore its economic viability,"[343] the obvious response is that the specific "pricing and product development behavior" about which the EC complains did, in fact, lead to a significant increase in Boeing's large civil aircraft revenues and profits by 2006.[344]

262. The EC's effort to make a unitary causation claim based on the nature of the alleged subsidies is as weak as its attempt to show the effects from the quantitative characteristics of the alleged subsidies. In *U.S.-Cotton Subsidies (Art. 21.5)*, the Appellate Body noted the significance to adverse effects analysis of "evaluating the structure, design and operation of the subsidies, noting the need to "clearly explain" its conclusions regarding the nature of the subsidies at issue.[345]

263. Yet, the EC makes no effort to demonstrate that the bulk of the alleged subsidies were of a nature that would affect the product development or pricing decisions of a company like Boeing. Rather, the EC argues that they provided Boeing "nonoperating cash flow" to which it otherwise would not have had access. But characterizing an alleged subsidy to a company with unfettered access to capital markets as "nonoperating cash flow" means that the alleged subsidy

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Based Metrics: Foundations and Practice, p. 148 (Frank Fabozzi and James Grant eds., 2000) (Exhibit US-1361)); Aswath Damodaran, *Return on Capital (ROC), Return on Invested Capital (ROIC), and Return on Equity (ROE): Measurement and Implications* 9-10 (Exhibit US-1362).

[341] US Comments on EC RPQ 292, paras. 580-584; Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit US-1359).

[342] EC FWS, para. 1248 (Washington state infrastructure, etc.) Similar assertions appear in EC FWS, paras. 1254 (Kansas); 2155 (Illinois); 1257 (NASA, DoD, and DOC research contracts); 1271 (IR&D and B&P reimbursements); 1273 (NASA and DoD facilities, equipment, and employees); and 1275 (Edmunds Community College).

[343] EC RPQ 292, para. 667.

[344] ITR Economic Viability Report, Table 1.b (showing in the "Revenue – Commercial Airplanes ('CA')" item that BCA's revenues increased from $19.925 billion in 2004 to $28.465 billion in 2006, and showing in the "CA Earning from Operations" items that BCA's earnings increased from $745 million in 2004 to $2.733 billion in 2006).

[345] *US – Cotton Subsidies (21.5) (AB)*, para. 361.

is unlikely to affect the recipient's product development or pricing decisions; free cash to a company that has access to capital markets to finance investments it considers worthwhile is, by definition, *not* supply creating or supply-maintaining.[346]

264. Moreover, the EC has submitted no convincing evidence as to how the various forms of the alleged NASA and DOD subsidies (which range from payments to companies other than Boeing to work done by NASA employees on research of primary interest to NASA) confer any advantage on Boeing's large civil aircraft. To illustrate, some of the NASA research that the EC alleges subsidizes Boeing is on topics such as hypersonic flight, air traffic management, rotorcraft, VTOL/STOL,[347] engines, and small aircraft[348] that Boeing's large civil aircraft division would never have researched on its own. In addition, NASA broadly disseminates the results of its work and of its contractors' work, allowing anyone, including Airbus, to build on that foundation. Instead of explaining exactly how the "structure, design, and operation" of these and other NASA programs conferred a competitive advantage on Boeing's large civil aircraft operations, the EC simply asserts that all of the alleged NASA and DOD subsidies provide Boeing with the equivalent of additional "nonoperating cash flow."[349]

265. The emphasis that the Appellate Body Report places on the need for persuasive evidentiary support for a serious prejudice claim also arises in connection with the EC's failure to answer the United States' contention that the alleged indicia of serious prejudice it ascribes to the alleged subsidies is, in fact, attributable to "other factors." Under Parts II and III of the SCM Agreement, a panel may not make a finding of serious prejudice if the indicia of serious injury are properly attributed to other factors. Nothing in the Appellate Body's endorsement of a unitary approach to causation analysis relieves a complaining party of the burden of showing that the prejudice that it attributes to the alleged subsidies is, in fact, attributable to the alleged subsidies, and not to other factors.

266. Thus, for example, when the EC asserts that the technology effect of the alleged subsidies was to give Boeing an advantage over Airbus in the use of composite technology, it must be able to refute, based on evidence, the U.S. evidence that Boeing's advantage was, in fact, the consequence of Boeing's decision to focus on a new aircraft that uses composite technology in a revolutionary way while Airbus *chose* to devote its R&D effort to its super jumbo A380.

267. Similarly, where the evidence shows that Airbus deliberately undercut Boeing's prices to gain market share for years, and with far-reaching effects on Airbus' own pricing, the EC has not met its burden to prove that Airbus' prices would have been higher "but for" the effects of the

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[346] US FWS, 832-839; US SWS, para. 181; US RPQ 63, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3).

[347] An acronym for "vertical take-off and landing/short take-off and landing."

[348] US RPQ 176, paras. 164-169 and US RPQ 188, paras. 220-223.

[349] EC FWS, paras. 1246-1276.

alleged subsidies. The EC would have the Panel ignore relevant evidence on this point on the basis that the reference period should be limited to the 2004-2007 period, but the Appellate Body Report in *US – Cotton Subsidies* endorsed a longer-term view, stating that "nothing in Article 6.3(c) of the *SCM Agreement* suggests that the examination of the effect of a subsidy must focus exclusively on the short-term perspective."[350]

268. Thus, while the United States accepts the validity of a unitary and a "but for" approach to serious prejudice and causation in this case, it rejects any implication that such an approach reduces the EC's burden of presenting evidence both to prove its claim and to refute the U.S. contention that, to the extent there has been any prejudice to the EC, it has been the result of factors unrelated to the alleged subsidies.

371. Of what relevance, if any, is the type of financial contribution through which a subsidy is provided (e.g., grant, loan, tax reduction) to the assessment of the effects of that subsidy? Is it appropriate to assess the effect of a subsidy in the form of funding of R&D activities on the basis of what the recipient learned from conducting the research that was funded by the subsidies?

269. The "effects" of a subsidy for purposes of assessing whether it is actionable under Articles 5 and 6 of the SCM Agreement are the "effects" specified in Article 6, such as lost sales, displacement/impedance, or price suppression. The type of financial contribution through which a subsidy is provided (*i.e.*, its form) is a matter of considerable consequence in assessing the existence of a subsidy and measuring its magnitude. Each different subsidy type (*e.g.*, grant, loan, tax benefit) will be measured relative to its own "market" benchmark, and the benefit to the recipient will, accordingly, vary from subsidy type to subsidy type.

270. The form of the financial contribution is one factor in determining whether it has one of the "effects" listed in Article 6.3. But the nature of a subsidy – its structure, design, and operation – also plays an important role. Thus, the staged repayment obligation of a subsidized long-term loan will give it a different effect than a one-time grant. But if both are tied to the development of a new aircraft, they would have the similar effect of bringing new supply to the market. In contrast, a loan, grant, or tax reduction to undertake basic research and development without any conditions relating to the development or production of a new aircraft will affect a company's cash flow, but may have no effect on prices or supply.

271. The analysis of the effect of research subsidies depends on the terms of the research payment. If the research subsidy is directed at the development of a particular aircraft, then it will likely affect the supply of that aircraft, which may lead to one of the effects specified in Article 6.3. Where the research undertaken with a subsidy is general R&D unrelated to particular products, it is unlikely to affect supply.

[350] *US – Cotton Subsidies (21.5) (AB)*, para. 392.

272. However, an *ex post* consideration of the actual outcome of a research program can play no role in the analysis of its effects. Most importantly, if the recipient of an alleged subsidy has a self-funded research program, as Boeing does, it may have developed the technology on its own in the absence of the alleged subsidy. The more critical the technology, the more likely it is that the recipient would have spent its own money for development. Thus, an attempt to link government funding to the application of particular technologies in an aircraft is completely speculative. In addition, such an *ex post* inquiry divorces the alleged subsidy from the elements that make it a subsidy – the financial contribution and a benefit in the form of receiving something on terms more favorable than are available in the market.

273. In this dispute, none of the alleged research subsidies are tied to the development, production, or pricing of large civil aircraft. The vast majority of NASA programs addressed general topics with no focus on a particular aircraft. Although the HSR program did focus on a particular aircraft, that aircraft – a civil supersonic airliner – never came to market, so there is no issue of creating supply or affecting prices.

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386. In connection with the position of the United States that revenue foregone within the meaning of Article 1.1(a)(1)(ii) of the SCM Agreement only encompasses revenue that has been foregone in the past, could the United States respond to the arguments of the European Communities at paragraphs 695-696 of the European Communities' Second Written Submission?

274. In paragraphs 695-696 of its second written submission, the EC sets forth an argument relating to whether certain alleged subsidies result in adverse effects. However, the U.S. argument regarding the meaning of "revenue foregone" in Article 1.1(a)(1)(ii) of the SCM Agreement relates to whether there is a financial contribution, one of the elements necessary to establish the existence of a subsidy. This does not prevent the Panel from considering the nature of the alleged subsidies in question by "examining their structure, design and operation with a view to discerning their effects"[351] for purposes of the adverse effects analysis.

387. In US Comments on EC RPQ 275, para. 483, the United States argues, "The key causation issue {the European Communities} has raised is a "but for" question that has nothing to do with "amortization" and "allocation" of the alleged subsidies but, instead, requires an analysis of Boeing's ability to price and develop its large civil aircraft as it did without the alleged subsidies. While that analysis is obviously very sensitive to the amount of the alleged subsidies, it is not sensitive to an amortization and per-plane allocation of the alleged subsidies as if this were a countervailing duty case." Given that the European Communities has generally structured the arguments and evidence it presents in support of its adverse effects claim on the basis of the three relevant LCA product markets that it alleges exist (EC RPQ 274, para. 481), how does the United

[351] US FWS, paras. 728-30, citing *US – Cotton Subsidies (Panel)*, para. 7.1193.

States suggest that the Panel relate the aggregate amount of any non-recurring subsidies that it may find to exist to the three relevant LCA product markets, in order to assess the effects of any such subsidies in those three LCA product markets?

275. The Panel should relate any non-recurring subsidies to the three relevant product markets based on (a) the claims and argumentation presented by the EC, and (b) the evidence concerning relevant factors such as the alleged subsidies' nature and magnitude, as well as conditions of competition in the large civil aircraft markets.

276. The EC's claims of serious prejudice pertain only to the three "product markets" it identified, and in its argumentation in support of those claims, the EC has admitted that "subsidies benefitting {the 717, 747, 757, 767, MD-11, MD-80, and MD-90} do not have *any* present effects on Airbus."[352] The EC has estimated that the alleged subsidies benefitting those non-subject Boeing aircraft amount to $7.5 billion, or 39 percent, of the $19.1 billion total alleged for the 1989-2006 period.[353] As the EC has structured its adverse effects argument this way, it must accept the consequences that flow from it. Thus, even though the EC characterizes the alleged non-recurring subsidies (primarily NASA and DoD programs) as providing BCA the equivalent of "free cash" that is unconnected to any particular Boeing large civil aircraft, the logic of the EC argument requires the assignment of 39 percent of those alleged subsidies to sales of aircraft that "do not have *any* present effects on Airbus."[354] Thus, under the EC's serious prejudice argument, 39 percent of any non-recurring subsidy amount found to exist becomes irrelevant to the analysis.

277. It is true that, in its recent attempt to show BCA would not have been viable without the alleged subsidies, the EC has attempted to claw back the alleged subsidies to Boeing large civil aircraft outside of the three product markets at issue in this dispute.[355] Nevertheless, it remains contradictory to state that alleged subsidies to non-subject Boeing aircraft have no price effects on subject Airbus aircraft, but that those same subsidies, if considered in assessing BCA's economic viability, *do* have price effects on subject Airbus aircraft.

278. In assessing any non-recurring subsidies found to exist, the Panel should focus on their nature. In this connection, even accepting the EC's characterization of the alleged nonrecurring subsidies as the equivalent of free cash to BCA, the United States has shown that, by its nature, such free cash (a) is untied to the supply or pricing of any particular Boeing large civil aircraft

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[352] EC Comments on US RPQ 71, para. 225 (emphasis added); see also US Comments on EC RPQ 276, paras. 488-492.

[353] US Comments on EC RPQ 276, paras. 488-492; US SWS, para. 172; *Orders of aircraft that the EC concedes are not causing serious prejudice* (Exhibit US-1147).

[354] EC Comments on US RPQ 64, para. 225 (emphasis added); see also US Comments on EC RPQ 276, paras. 488-492.

[355] EC RPQ 276, paras. 514-516.

models, and (b) would not affect the investment or pricing decisions of a company like Boeing, which does not face significant constraints in its access to capital markets.[356]

279. The only remaining question would be whether, if it had not received 61 percent of any non-recurring subsidy amount found by the Panel, BCA could have priced the 787, 737, and 777 as it did, and developed the 787 as it did. Considering that the United States has shown that BCA would have been economically viable "but for" the alleged subsidies even if the full amount of the EC's exaggerated $19.1 billion subsidy calculation is accepted at face value,[357] there can be no question that a lesser amount would have had no effect on BCA's pricing and product development.

388. With reference to US Comments on EC RPQ 276, para. 490, please explain why the fact that the European Communities' allegations of serious prejudice go only to three aircraft – the 787, 737 and 777 means that the proper counterfactual for the European Communities' "but for" analysis is whether absent subsidies related to those aircraft, the serious prejudice would not have occurred.

280. The counterfactual identified in Question 388 follows from the manner in which the EC has structured and argued its serious prejudice claims. As discussed in the U.S. response to Question 387, the $7.5 billion in subsidies that the EC allocates to the 717, 747, 757, 767, MD-11, MD-80, and MD-90 are irrelevant to the Panel's "but for" analysis because (a) those aircraft are not in the three "product markets" that are the subject of the EC's serious prejudice claims, and (b) the EC has admitted that alleged "subsidies benefitting {the 717, 747, 757, 767, MD-11, MD-80, and MD-90} do not have *any* present effects on Airbus."[358]

281. Here, the United States is doing nothing more than stating the consequences that necessarily result from the way in which the EC has presented its adverse effects case.

389. Please explain how the analysis of the ways in which different types of subsidies are likely to affect the behaviour of the recipient and, therefore, competition, set forth in Exhibit US-1309, relates to the United States' arguments in its First Written Submission, paras. 863-872 regarding the nature of the various types of subsidies at issue in this dispute.

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[356] US FWS, 832-839; US SWS, para. 181; US RPQ 63, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3).

[357] US Comments on EC RPQ 292, paras. 580-584; *see also* Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit US-1359).

[358] EC Comments on US RPQ 64, para. 225 (emphasis added); *see also* US Comments on EC RPQ 276, paras. 488-492.

282. In their Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market (the "Stiglitz/Greenwald Statement"), Professors Joseph E. Stiglitz and Bruce C. Greenwald review "the different types of programs that governments have used to support their aerospace industries" with specific reference to (1) new product development or launch subsidies, (2) general research and development subsidies not specifically related to particular products, and (3) unrestricted cash subsidies.[359] They conclude that

> there is a critical difference in terms of their impact on competition and, therefore, market pricing between, on the one hand, subsidies that create supply, maintain uneconomic supply or are tied to the production and sale of a particular aircraft model, and, on the other, those that do not or are not.[360]

283. The Stiglitz/Greenwald Statement also notes "a continuum in the magnitude of" the impacts of different types of subsidies:

> The first, and most important, effect arises when a subsidy is so substantial that "but for" it, the recipient would not be a viable competitor in the market at issue. In the second place are product-specific subsidies and/or unrestricted subsidies without which particular product lines would not exist or would be significantly different in their scope. These too clearly have a significant impact on prices and output. Third, there are subsidies that either by providing marginal incentives to increase market production or, in the case of unrestricted subsidies, by relaxing funds availability and risk constraints, affect price outputs and sales decisions at the margin. Finally, there are subsidies to companies that have unfettered access to capital markets that do not reduce the marginal cost of producing or selling a particular product and are untied to any activity or are tied to activity that is not supply creating or supply maintaining. These subsidies are unlikely to affect the recipients' production or pricing decisions.[361]

284. The Panel has asked how the Stiglitz/Greenwald analysis of the ways in which different types of subsidies are likely to affect competition relates to the views of the United States on the nature of the alleged subsidies as expressed in paragraphs 863-872 of the U.S. first written submission. Those paragraphs address the operational details of various U.S. programs and policies rather than their core economic nature. The discussion points out, for example, that there is no evidence to support the EC's claim that the R&D services the U.S. government purchased from Boeing were for research and development related to large civil aircraft that

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[359] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, pp. 2-4 (Exhibit US-1309).

[360] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, p. 1 (Exhibit US-1309).

[361] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, pp. 4-5 (Exhibit US-1309).

Boeing would otherwise have had to do on its own, much less finance by raising its large civil aircraft prices. This analysis differs significantly from the Stiglitz/Greenwald analysis of the effects of broad categories of subsidies defined by key economic characteristics.

285. That said, and assuming for the sake of argument that the programs and policies discussed in paragraphs 863-872 confer actionable subsidies on Boeing's large civil aircraft operations – a point the United States vigorously contests – the alleged subsidies fall as follows on the Stiglitz/Greenwald "continuum":

- If the tax programs described in US FWS, paragraphs 864 and 865, were actionable subsidies, they would fall into the Stiglitz/Greenwald category of subsidies that provide marginal incentives to increase production. The Stiglitz and Greenwald Statement observes, however, that the impact of a subsidy depends, in part, on its amount.[362] The alleged Washington State B&O tax measures are too small to materially affect competition between Boeing and Airbus.[363]

- If the challenged NASA, DoD, and other government R&D programs described in US FWS, paragraphs 866-872, were actionable subsidies, they would fall into the Stiglitz/Greenwald category of "general research subsidies not specifically related to particular products"[364] or subsidies "that do not reduce the marginal cost of producing or selling a particular product and are untied to any activity or are tied to activity that is not supply creating or supply maintaining."[365]

286. This characterization of the alleged subsidies is, in fact, much the same as the EC's characterization of them. The Cabral Report, for example, describes the challenged NASA, DoD and other research programs as providing Boeing with additional free cash.[366]

287. Thus, if the panel were to conclude that one or more of the *tax programs* in question confers a subsidy on Boeing's large civil aircraft operations, the question for purposes of adverse effects analysis would be whether their effect on Boeing's revenue had a material effect on production and/or sales and, thus, on competition and pricing in the large civil aircraft market. On this question, the United States stands by the analysis in its first written submission: that

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[362] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, p. 1 (Exhibit US-1309).

[363] US RPQ 229, paras. 374-378.

[364] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market at 2 (Exhibit US-1309).

[365] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, p. 5 (Exhibit US-1309).

[366] Cabral Report, p. 9 (Exhibit EC-4) ("non-repayable development subsidies are essentially fungible with cash.").

(1) the alleged tax benefits were not significant enough to affect Boeing's large civil aircraft supply, [367] (2) the alleged subsidies therefore had no "supply side" impact on market prices, [368] and (3) Boeing's incentive was always to retain as much of the tax program benefits as the market would permit.[369]

288. In the case of the FSC program, the question is, moreover, moot. The FSC program has already been the subject of a separate WTO panel decision; Boeing does not, and for some time has not, received any FSC program benefit.[370]

289. Because the *NASA, DoD and other non-recurring R&D programs* described in paragraphs 866-872 of the United States' first written submission are untied to the development, production, or sale of any Boeing commercial aircraft,[371] if found to be subsidies, they would be "general research and development subsidies not specifically related to particular products" or "unrestricted cash subsidies" for purposes of the Stiglitz/Greenwald Statement. As such, their effect on Boeing's LCA operations (and, therefore, on competition) depends on whether they have been "so substantial" that "but for" them, Boeing "would not be a viable competitor in the {LCA} market" or, alternatively, whether they have provided Boeing access to funding needed for LCA product development that otherwise would have been unavailable.[372]

290. The EC has argued both points. After running through a series of causation theories, the central EC argument now is that, "but for" the alleged R&D subsidies, Boeing would not be a viable competitor in the large civil aircraft market.[373] A subsidiary argument is that government contracts for research (*e.g.*, basic R&D on using composites in aerospace applications) allegedly provided a foundation for the development of the 787, making them "product-specific" subsidies on the Stiglitz/Greenwald "continuum". Neither survives examination.

291. More specifically, the most recent iteration of the EC's argument (*i.e.*, that "but for" the alleged subsidies, Boeing's investors would not have allowed Boeing to develop and price its aircraft as it did) fails for at least three reasons. First, as a threshold matter, the EC's argument that, absent the alleged subsidies, Boeing's return on capital would have been too low to support continued investment ignores one of the key determinants of the investment decisions – a company's prospects looking forward. To be sure, at any point in time, Boeing's past

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[367] US RPQ 229, paras. 374-378.

[368] US RPQ 229, paras. 374-378.

[369] US FWS, para. 825; US RPQ 93, paras. 231-234.

[370] Statement of James H. Zrust (Exhibit US-1341).

[371] US RPQ 286(a), para. 501; US Comments on EC RPQ 275, para. 483; US Comments on EC RPQ 286, 520.

[372] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, p. 4 (Exhibit US-1309).

[373] EC RPQ 292, paras. 647-651

performance would have been of interest to an investor. However, an investor in the 2001-2004 period would have focused more on Boeing's future prospects, particularly the prospects for a revolutionary new 787 aircraft, than on past financial data. In conjunction with the increase in Boeing's post-2003 profitability, the record-breaking popularity of the 787 would have fully justified a forward-looking investment. By making an argument about investment decisions based exclusively on a backward look at the numbers, the EC disregards real market conditions.

292. Second, the EC's argument fails even on its own terms because it depends entirely on the EC's exaggerated calculations of the amount and magnitude of the alleged subsidies. The EC argues that "but for" the alleged $19.1 billion in alleged subsidies, Boeing would not have been a viable competitor in the large civil aircraft market.[374] But that argument falls apart as soon as the magnitude of the subsidies drops from the stratospheric levels that the EC has alleged.[375]

293. Third, even if the Panel concludes that the economic viability of Boeing's 2004-2006 operations can be assessed solely by reference to the company's *historic* return on its large civil aircraft operations, and even if the EC's amount-of-the-alleged-subsidies calculation is taken at face value (and Boeing's after tax operating income is, therefore, reduced by the amount of the subsidies alleged by the EC), *the data still show that those operations are, and have always been, economically viable.*[376]

294. There is broad agreement among investment analysts that the best measures of the *historic* viability of a business are its return on invested capital ("ROIC") over time measured against the average cost of capital to the business, or metrics using the same components, such as economic profit and Economic Value Added ("EVA").[377] There can be variations in the details of ROIC and economic profit calculations, but the essential elements of the calculation are well-established:

- Return on invested capital compares the net after-tax operating profit of the enterprise to the capital invested in the enterprise.[378]
- Invested capital does not include the enterprise's excess cash.[379]

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[374] EC RPQ 292, para. 648.

[375] US Comments on EC RPQ 292, paras. 561, 571.

[376] US Comments on EC RPQ 292, paras. 580-587; Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit US-1358).

[377] US Comments on EC RPQ 292, paras. 574-579; Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit US-1358).

[378] US Comments on EC RPQ 292, para. 577; Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit US-1358).

295. The United States is providing with this submission materials from valuation texts and experts that explain the utility of the ROIC, EVA, and EP metrics and the correct way to calculate them.[380]

296. Using the data on Boeing's operations for the period 1989 through 2006 (including "operating profit less subsidies" and weighted average cost of capital data compiled by the EC's own economic consultants), the United States demonstrated in its comments on the EC's answers to the panel's second set of questions that, between 1989 and 2006, Boeing's return on invested capital was significantly above its weighted average cost of capital even after subtracting the EC's exaggerated amount the alleged subsidies.[381] There are, of course, years in which Boeing's large civil aircraft operations did not perform well. The 2003-2005 period falls into this category because Airbus pricing forced Boeing to absorb the impact of significant market share losses when demand was weak. However, the EC's analysis focuses not on the down years, but on the 1989-2006 period as a whole.

297. Because the data so convincingly disprove the EC's contention that, but for the alleged subsidies, Boeing's large civil aircraft operations would not be viable over the 1989-2006, all of the alleged non-recurring subsidies necessarily fall into the fourth category on the Stiglitz/Greenwald continuum. That is, if the NASA and/or DoD programs constitute subsidies within the meaning of Article 1 of the SCM Agreement, they are subsidies (1) to a company which has unfettered access to capital markets, [382] (2) that do not reduce Boeing's marginal cost of producing or selling any particular large civil aircraft, and (3) are not tied to any activity that is supply creating or supply maintaining.[383] As such, they are, to quote Professors Stiglitz and

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[379] US Comments on EC RPQ 292, paras. 579-580; Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Koller, Goedhart, and Wessels, Valuation: Measuring and Managing the Value of Companies (McKinsey & Co., 4th ed. 2005), p. 171 (Exhibit US-1360); Jason L. Wolin and Steven Klopukh, *Integrating EVA into the Portfolio Management Process*, in Value-Based Metrics: Foundations and Practice, p. 148 (Frank Fabozzi and James Grant eds., 2000) (Exhibit US-1361)); Aswath Damodaran, *Return on Capital (ROC), Return on Invested Capital (ROIC), and Return on Equity (ROE): Measurement and Implications* 9-10 (Exhibit US-1362).

[380] Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Koller, Goedhart, and Wessels, Valuation: Measuring and Managing the Value of Companies (McKinsey & Co., 4th ed. 2005), p. 171 (Exhibit US-1360); Jason L. Wolin and Steven Klopukh, *Integrating EVA into the Portfolio Management Process*, in Value-Based Metrics: Foundations and Practice, p. 148 (Frank Fabozzi and James Grant eds., 2000) (Exhibit US-1361)); Aswath Damodaran, *Return on Capital (ROC), Return on Invested Capital (ROIC), and Return on Equity (ROE): Measurement and Implications* 9-10 (Exhibit US-1362).

[381] US Comments on EC RPQ 292, paras. 571-584.

[382] US FWS, 832-839; US SWS, para. 181; US RPQ 63, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3).

[383] US RPQ 286, para. 501; US Comments on EC RPQ 286, para. 520; Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market at 3 (Exhibit US-1309).

Greenwald, "unlikely to affect {Boeing's} production or pricing decisions."[384] They do not, as the EC contends,[385] fit into the category of subsidies without which the recipient would be non-viable.

298. In addition to its claim that "but for" the alleged NASA and DoD subsidies Boeing would not have been a viable participant in the large civil aircraft market, the EC also claims that "but for" the same subsidies, Boeing would not have had the technological capability to develop the 787 as it did.[386] But even if some of the basic research Boeing did under its government contracts is in the same general field as the work done (and still being done) to develop the 787, the evidence shows that none of the alleged NASA and DoD programs were tied to the development, production, or sale of the aircraft itself. The EC's allegation that Boeing received "product-specific" R&D subsidies for the purpose of bringing a new aircraft to market is, as a factual matter, simply wrong.[387] The Stiglitz/Greenwald Statement makes a critical distinction between R&D subsidies that are not tied to the development *of a particular aircraft* and those, like "launch subsidies," that are "product-specific."[388] Because R&D that is not tied to the development of new aircraft is not supply-creating, its market impact is, according to the Stiglitz/Greenwald Statement, unlikely to be significant. To quote from the Statement:

> **"2. General Research and Development Subsidies not Specifically Related to Particular Products**
>
> Payments for basic research activities unrelated to the development of particular products (*e.g.*, research in basic technologies related to supersonic flight or composites for use in aerospace applications) are unlikely to have a decisive impact on development decisions or on the production or sale of aircraft. These technologies may provide a foundation on which a company or, if the results of the research in question are made broadly available, the industry as a whole, can eventually develop new generations of aircraft, but as the subsidies are not tied to a supply creating launch decision, their impact on the market is unlikely to be significant. One way to gauge the maximum impact of such general research subsidies is to look at the effect of a grant of an equivalent amount of unrestricted cash. This captures the maximum impact because unless there is evidence that but for the government program, the recipient company would have undertaken

[384] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, p. 5 (Exhibit US-1309).

[385] EC Comments on US RPQ 286, paras. 477-478.

[386] EC RPQ 2850, paras. 558-569.

[387] US FWS, paras. 943-953; US SWS, paras. 194-196.

[388] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, pp. 2-3 (Exhibit US-1309).

the same research on its own, the value of the research subsidy to the recipient will be less than the equivalent amount of unrestricted cash."[389]

390. In support of its allegations of price suppression, the European Communities presents arguments and evidence which appear to be premised on the proposition that supply and demand principles suggest that LCA prices should increase with a surge in demand and reduced availability of delivery slots (EC, First Written Submission, paras. 1389, and 1593; EC RPQ 306 paras. 783-786; EC RPQ 309 paras. 804-805). If the United States agrees that the price elasticity of demand for LCA is most likely rather small (US Comments on EC RPQ 303, para. 608), is it reasonable to assume that, all other things being equal, supply and demand principles suggest that LCA prices should increase with a surge in demand and reduced availability of delivery slots, as suggested by the European Communities?

299. No, such an assumption would be unreasonable. It is a truism to state the general proposition that, all other things being equal, an increase in demand that outstrips supply should lead to an increase in prices. This, however, is not what the EC is "suggesting." Rather, the EC asks the Panel to believe that, *in the particular circumstances of the large civil aircraft market during the 2004-2006 period*, increases in orders should have coincided with an immediate increase in aircraft prices.[390] If they are to have any relevance, "supply and demand principles" must account for the conditions of competition in the large civil aircraft market and the circumstances surrounding the surge in demand. These conditions restricted the degree to which prices could rise, notwithstanding any general characterizations about the price elasticity of demand.

300. Most relevant is the fact that large civil aircraft are capital goods that are frequently purchased through orders with delivery schedules that stretch out for years. An airline evaluating the purchase of large civil aircraft must, in considering the cost of the aircraft against the expected cash flows to be generated in operating the aircraft, account for its competitors' aircraft costs. If a competitor obtained very favorable pricing on aircraft that will be in service for the foreseeable future, then that competitor will have greater flexibility to reduce fares. That prospect will affect cash flows for all airlines serving the same routes, and thereby reduce the net present value that the prospective purchaser will attach to new aircraft, and reduce the price it is willing to pay for those aircraft.

301. Competition between the 737 and A320 illustrates this point. In prior submissions, the United States demonstrated that A320 price levels in 2005 and 2006 are not the result of the

[389] Stiglitz and Greenwald, Statement on the Question of the Impact of Subsidies on Supply and Prices in the LCA Market, p. 3 (Exhibit US-1309).

[390] EC RPQ 309, para. 804 ("With order books expanding rapidly beyond both the actual and planned production increases, both Airbus and Boeing should have seen their market power (*i.e.*, their ability to increase LCA prices) increase proportionately.").

alleged subsidies, but rather reflect the ongoing effects of Airbus' decisions to keep production levels at pre-downturn levels throughout the 2001-2004 period and to undercut Boeing 737 prices to increase market share.[391] In the words of an industry expert, "Airbus keeps the {production} tap open wider than Boeing and cuts prices to move airplanes."[392] With low-priced A320s entering into service at easyJet, AirAsia and elsewhere around the world in 2005 and 2006, and many more scheduled to do so in subsequent years, it is no surprise that airlines seeking to order new single-aisle aircraft in 2005 and 2006 demanded prices that would allow them to compete with airlines that secured low-priced A320s during the 2001-2004 market downturn. This can be seen in (a) the **[***],**[393] and (b) the evidence regarding the 2005 campaign at Lion Air, an AirAsia competitor based in Indonesia.[394] These multi-year effects of Airbus' price undercutting illustrate the observation made by BCA's Vice President for Revenue Management that, "{w}hen an LCA producer lowers prices at a particular account, there are significant risks that the lower pricing level will spread across the market."[395]

302. Thus, the effects of Airbus' aggressive pricing of high-volume/long delivery stream orders during the 2001-2004 period did not stop simply because demand began to increase. Customers continued to seek prices that would allow them to compete with low-priced Airbus aircraft that their competitors would be bringing into service for many years in the future.[396]

303. The ability of an aircraft producer to increase prices amidst rising aggregate demand may also be limited if its aircraft has performance shortcomings relative to the other producer's aircraft. Developments in the so-called "300-400 seat market" expose the pitfalls of drawing inferences from generalized characterizations concerning how supply and demand principles apply to a market in which the price elasticity of demand is rather small in the aggregate. In the 2004-2006 period, **[***]**[397] The EC concedes that increasing fuel prices account for some, though not all, of [***],[398] but has failed to show that the alleged subsidies had *any* contributing effects, much less to cause significant price suppression.[399]

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[391] US FWS, paras. 1065-1070; US SWS, HSBI Appendix, paras. 57-59.

[392] Scott Hamilton, *Airbus targets appraisers on values*, Jetrader, pp. 12-14 (Jun. 2007) (Exhibit US-277).

[393] US Comments on EC RPQ 299, para. 594; US OS2 (conf.), paras. 9-10; *see also* Boeing 737 Average Order Revenue Chart (Constant Dollars) (Exhibit US-1164).

[394] US SWS, HSBI Appendix, para. 58.

[395] Statement of Clay Richmond at 4 (Exhibit US-275) (HSBI).

[396] US SWS, HSBI Appendix, paras. 49-59; US OS2 (conf.), paras. 9-10; US RPQ 299, paras. 529-532.

[397] *Compare* Boeing 777 Average Order Revenue Chart (Constant Dollars) (Exhibit US-1164), *with* EC RPQ 306, para. 785 (providing A340 average prices for the 2000-2006 period); *see also* US RPQ 299, paras. 535-536.

[398] EC RPQ 88, para. 475.

[399] US Comments on EC RPQ 87, para. 336.

391. The United States argues that, because "the alleged subsidies are mostly untied funds unrelated to the development, production or sale of any particular aircraft, they are completely irrelevant to the economics of {Boeing's pricing} decision except to the extent they give Boeing the ability to price in a profit maximizing way that would otherwise be impossible." (US Comments on EC RPQ 288, para. 534) The United States also argues that "the EC ignores the elementary economic truth that the profit maximizing price is not affected by subsidies that do not affect marginal costs or revenues". (US Comments on EC RPQ 290, para. 542) These arguments imply that, to the extent that the alleged subsidies at issue in this dispute may be considered to reduce Boeing's costs, the costs in question are "sunk" at the time that the pricing decision is made and thus do not effect marginal revenues or marginal costs. Please indicate whether this understanding of the implications of the United States' arguments is correct, and explain why the United States considers that the alleged subsidies at issue in this dispute are not such that they could have an effect on Boeing's marginal revenues or marginal costs.

304. The United States did not intend to "imply that, to the extent that the alleged subsidies at issue in this dispute may be considered to reduce Boeing's costs, the costs in question are 'sunk' at the time the pricing decision is made and thus do not effect revenues or marginal costs." The critical part of the U.S. adverse effects argument is that the most important issue regarding the nature of an alleged subsidy is whether it is supply-creating or supply-maintaining. A subsidy that is tied to the development, production or sale of a product will affect the supply, and therefore, the pricing, of that product. By contrast, a subsidy that is not supply-creating or supply-maintaining is unlikely to have an impact on a producer's pricing. These observations hold true regardless of whether the subsidy reduces the producer's sunk costs or its marginal costs.

305. Paragraph 534 of the U.S. Comments on EC RPQ 288, cited in this question, argues that because almost all of the subsidies alleged by the EC *are unrelated to the development, production, or sale of any particular Boeing commercial aircraft*, there is no basis for the EC's contention that they had a material effect on Boeing's large civil aircraft pricing decisions. The fact that the challenged NASA and DoD programs funded R&D that, for the most part, was completed (*i.e.*, was "sunk") long before Boeing made the pricing decisions at issue in this dispute makes the EC's burden of proof more difficult to meet. However, the "sunk" nature of that research is *not* the central point of the U.S. argument.

306. Subsidies to develop a particular aircraft may be "sunk" at the time the aircraft is brought to market, but because they are by definition supply-creating subsidies, they necessarily have an impact on supply and, therefore, on competition and market pricing. The key point of the U.S. argument is that because, with the exception of certain low- value tax programs, the alleged subsidies about which the EC complains are not tied to development, production or sale of any large civil aircraft, they are not in any sense supply-creating and thus had no appreciable impact on market pricing.

307. In their statement, Professors Stiglitz and Greenwald draw a critical distinction between the effects of subsidies that are supply-creating and those that are not.

> {T}here is a critical difference in terms of their impact on competition and, therefore, market pricing between, on the one hand, subsidies that create supply, maintain uneconomic supply or are tied to the production or sale of a particular aircraft model, and, on the other, those that do not or are not.[400]

They conclude that:

> …subsidies to companies that have unfettered access to capital markets that do not reduce the marginal cost of producing or selling a particular product and are untied to any activity or are *tied to activity that is not supply-creating or supply-maintaining* … are unlikely to affect the recipient's production or pricing decisions."[401]

308. The Appellate Body's decision in *US – Cotton Subsidies (21.5)*, which placed great weight on whether subsidies are, in their nature, supply-creating or supply-maintaining, echoes the analysis of Professor Stiglitz and Greenwald.[402] Thus, an assessment of the EC's claim of serious prejudice through the effects of the alleged NASA and DoD subsidies would need to address the evidence that even if they were subsidies, they would have no material impact on Boeing's product development or pricing decisions *both* because they do not affect Boeing's marginal large civil aircraft production costs *and* because they are not tied to any other supply-creating or supply-maintaining activity.

309. Because most of the U.S. programs that it alleges subsidize Boeing *neither* reduced Boeing's marginal costs *nor* were tied to the development, production or sale of large civil aircraft, the EC has, instead, had to build its causation argument on assertions that (1) Boeing always uses a predetermined portion of its free cash flow to "invest" in "aggressive" pricing and product development, and (2) in any event, the alleged subsidies have been so substantial that without them Boeing could not, or would not, have developed and priced its large civil aircraft as it did. The first of these assertions was premised on the Cabral Report. Once the errors of the Cabral Report were exposed, the EC refashioned its causation argument to contend that "but for" the alleged subsidies, Boeing would not have been a viable competitor in the large civil aircraft

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[400] Stiglitz/Greenwald, p. 1 (Exhibit US-1309).

[401] Stiglitz/Greenwald, p. 5 (Exhibit US-1309) (emphasis added).

[402] *US – Cotton Subsidies (21.5) (AB)*, para. 392 ("Whether production of a particular product is higher than it would have been in the absence of the subsidy is often a critical issue in establishing whether the effect of the subsidy is significant price suppression. In our view, the effect of a subsidy on production can also be assessed on the basis of a long-term perspective that focuses on how the subsidy affects decisions of producers to enter or exit a given industry.").

market. The evidence has also disproven that assertion.[403] In the end, the EC has nowhere to go with its argument because it has not been able to show by reference to the evidence that the programs it has challenged altered Boeing's behavior in the marketplace.

392. In US Comments on EC RPQ 303, para. 608, the United States states that "Boeing would necessarily be able to pass the full amount of the alleged per-plane subsidy magnitude on to customers only if demand for large civil aircraft were perfectly inelastic." Is it reasonable to infer from this statement that Boeing would likewise be able to pass something less than the full, but still a substantial, amount of the alleged per-plane subsidy magnitude on to customers if demand for large civil aircraft were relatively inelastic?

310. The short answer to this question is "no"; it is not reasonable to infer that, as the Panel hypothesizes, Boeing would "be able to pass something less than the full, but still a substantial amount of the alleged per-plane subsidy magnitude on to customers if demand for large civil aircraft were relatively inelastic." An equally valid question is whether Boeing would have had an incentive to pass through a substantial amount of the alleged subsidy magnitude. The answer to this question is also "no." Before elaborating, it is necessary to emphasize that assessing the degree to which Boeing's aircraft prices would have risen "but for" the alleged subsidies is a moot issue, which, given the relevant evidence, the Panel does not have to reach in its adverse effects analysis.[404]

311. The threshold question is whether, but for the alleged subsidies, Boeing could have and would have priced the 787, 737, and 777 as it did, and developed the 787 as it did. The answer to that question is "yes" because the evidence shows that (a) the alleged non-recurring subsidies, by their alleged nature as "free cash" untied to the development or sale of particular Boeing aircraft, would not affect the investment or pricing behavior of Boeing;[405] (b) Boeing would have had sufficient funds to price and develop its aircraft as it did, even if the EC's fanciful $19.1 billion alleged subsidy figure is subtracted from BCA's after-tax operating profits for the 1989-2006 period; [406] and (c) the prices Boeing obtained during the 2001-2006 period were profit maximizing, such that it would have the same incentive to price as it did regardless of the existence of any subsidies.[407]

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[403] US Comments on EC RPQ 292, paras. 580-584; *see also* Professor David Wessels, The Economic Viability of Boeing's Commercial Aircraft Division (July 30, 2009) (Exhibit US-1358); Stern Stewart & Co., Comments on Economic Viability Analysis (July 29, 2009) (Exhibit US-1359).

[404] *See* US Comments on EC RPQ2, para. 610.

[405] US FWS, 832-839; US SWS, para. 181-182; US RPQ 63, para. 224; Comments of Prof. Greenwald, pp. 1-2 (Exhibit US-8); NERA Reply, pp. 5-6, 11 (Exhibit US-3); Stiglitz/Greenwald Statement at 3-4 (Exhibit US-1309).

[406] US Comments on EC RPQ 292, paras. 580-584.

[407] US Comments on EC RPQ 292, para. 568.

312. Given this evidence that Boeing's pricing would not have been any different under a "but for" counterfactual analysis, it would be pointless to allocate the alleged subsidy magnitude across Boeing's sales of the 787, 737, and 777, or to take the further steps of speculating about the degree to which alleged per-plane subsidy magnitudes would translate into (a) increases in Boeing aircraft prices, and (b) increases in Airbus aircraft prices. No "reasonable inferences" can be drawn concerning these issues because the predicate for such an exercise – *i.e.*, that Boeing's aircraft prices would have been different to some degree – has not been satisfied. Indeed, that predicate has been contradicted by compelling evidence in the record.

313. Turning to the specific question raised by the Panel, it is one thing to characterize generally the price elasticity of demand for the large civil aircraft market as a whole. It is quite another to make assumptions about the pricing that one producer in that market could obtain without reference to the relevant evidence, including the other producer's behavior and the other relevant conditions of competition in the market.

314. The relatively price inelastic nature of aggregate market demand in a given market does not support an assumption that a particular producer will necessarily be able to increase prices substantially. In a duopoly market with relatively inelastic demand, Producer A should not expect a given decrease in its prices to result in a directly proportional increase in aggregate market demand. Producer A may, however, be able to increase its share of the market at the expense of the Producer B. If Producer A cuts prices to increase market share, Producer B must lower its prices in response or lose market share. Unless Producer B's is prepared is to lose market share, a price increase by Producer B is not a viable option, as buyers have the alternative of purchasing from Producer A at a lower price.

315. Such a situation prevailed in the large civil aircraft market during the 2001-2006 period. Because of the downward price pressure resulting from years of Airbus price undercutting, customers would not accept prices from Boeing that were any higher than it was able to charge.[408] Having lost significant market share to Airbus, Boeing's decision **[***]** was the profit maximizing choice, regardless of the existence of subsidies.[409] Indeed, the EC concedes that "there may well be a number of reasons why it made sense for Boeing to offer discounts" during the period on which the EC has focused.[410] And where Boeing could increase prices, it did so, **[***]**.[411] Thus, it would be manifestly *un*reasonable to assume that, in a "but-for-the-subsidies" counterfactual, Boeing would have had any economic incentive to raise the prices it offered, much less the ability to obtain higher prices from customers equal to a "substantial amount of the alleged per-plane subsidy magnitude."

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[408] US Comments on EC RPQ 303, para. 607.

[409] US Comments on EC RPQ 292, para. 568.

[410] EC RPQ 290, para. 630.

[411] US Comment on EC RPQ 303, para. 610.

393. In regard to the United States' criticisms of the analyses undertaken by Professors Wachtel and Asker (US First Written Submission, paras. 470-481) the United States argues that Boeing's suppliers can and do sell to a variety of other entities, both inside and outside the aerospace sector (US First Written Submission, para. 476). Assuming an alternative market structure in which each supplier acts as a monopolist and sells its products to different buyers, including Boeing, the literature on taxation indicates that, in such a setting, (i) the optimal price set by the monopolist always increases with the tax rate, i.e. there is always some pass-through, and (ii) the extent of pass-through critically depends on the shape of the demand curve. (See, e.g., Varian, H., Microeconomic Analysis*, 3rd edition, Norton, New York, 1992, page 237.)*

(a) Would the parties agree that analogous results apply in the case of a subsidy (a negative tax), and how would the parties characterize these results?

(b) Since under such a market structure pass-through is positive (i.e. non-zero), but its size is principally dependent on the shape of the demand curve, please provide evidence on the nature of demand faced by the (monopolist) suppliers in question in order to narrow down the range of pass-through or to make a reasonable estimate. It would be useful for the parties to provide studies on how the extent of pass-through has been estimated in similar cases.

316. Before responding to the Panel's specific questions, the United States draws the Panel's attention to the following preliminary issues.

317. First, as a general matter, the United States notes that the question raised by the Panel refers to an economic analysis that neither of the parties has advanced and a text that neither of them has cited. The United States believes that this analysis does not support the EC's pass-through argument and, in fact, undermines that argument. The United States recalls that the Appellate Body has found that a panel may properly use its authority to "seek information and advice from experts and from any other relevant source it chooses" in order to "help it to understand and evaluate the evidence submitted and the arguments made by the parties." [412] However, a Panel may not "make the case for a complaining party."[413] An economic theory advanced by the Panel at this stage of the preceding might cross the line drawn by the DSU.

318. Second, the United States explained in response to Question 137 from the Panel that in view of the fact that alleged subsidies were provided to entities unrelated to Boeing and that are not producing the allegedly subsidized products, the EC has the burden to demonstrate that such alleged subsidies passed-through to that subsidized product. The EC, in its response to the same question, agreed. As discussed below, the EC has failed to meet this burden. The economic

[412] *Japan – Measures Affecting Agricultural Products*, WT/DS76/AB/4 (adopted 19 March 1999).

[413] *Japan – Measures Affecting Agricultural Products*, WT/DS76/AB/4 (adopted 19 March 1999).

model proposed by the Panel similarly does not lead to the conclusion that there is any pass-through.

319. Third, with respect to the substance of the Panel's question, the United States refers generally to the statement by Dr. Gary Dorman and Dr. Kristin Terris, attached as Exhibit US-1363 to this submission.[414] Dorman and Terris emphasize that the predicted pass-through for a particular tax or subsidy is highly sensitive to industry-specific assumptions and the characteristics of the individual firms concerned. They point out that the economic literature shows that altering the underlying assumptions for any given pass-through model will lead to widely differing results, including in ways not predicted by the theoretical model, and conclude that there is little guidance from the empirical literature that would allow one to determine a specific level of pass through without a careful empirical inquiry into the industry in question.

320. A previous report by the United States' expert Dr. Dorman already explained that the model presented by the EC experts, Professors Wachtel and Asker, was entirely theoretical and built on unrealistic assumptions that are at odds with reality in the large commercial airplane industry (monopsony, constant marginal costs, no market power for suppliers, no out-of-state competition, etc.).[415] The Dorman Report also pointed out that the EC's expert report cited no actual evidence, provided no empirical testing, and offered no data whatsoever to support its assumptions, let alone its conclusions.[416] The Wachtel/Asker model, in other words, fails to meet the EC's "pass-through" burden.

321. As Dr. Dorman and Dr. Terris explain in their statement, the theoretical approach suggested by the Panel in question 393 similarly does not allow any reliable conclusions.

322. First, Dorman and Terris explain that the textbook "monopoly supplier" model proposed in Question 393 does not reflect the actual market structure in the large civil aircraft supplier markets. Such markets are much more likely to be characterized by differentiated oligopolies, and there will likely be significant differences from one supplier/component market to another. The economic literature shows that pass-through results in such differentiated oligopolies are diverse and detailed empirical review is critical to determine whether and, if so, how much pass-through occurred.

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[414] Gary J. Dorman and Kristin L. Terris, *Economic Models and Subsidy Pass-Through* (July 30, 2009) ("Dorman-Terris Report") (Exhibit US-1363).

[415] Gary J. Dorman, *Reply to Reports of Professors Wachtel and Asker* (July 2, 2007) (Exhibit US-186) ("Dorman Report").

[416] The EC relied entirely on a reference to a book by New York Times journalist Thomas Friedman, *The World is Flat*, and references to two U.S. Department of Commerce studies. With respect to the latter, the Dorman Report explained that the EC's experts omitted key portions of the quotations they rely on, which Dorman explained, actually invalidated the EC's conclusions.

323. Even if one were to assume a simpler monopoly model, however, a range of empirical data would be needed to determine whether and how much pass-through may occur. The Panel refers to the shape of the demand curve (which is often assumed to be the only variable in highly simplified economic text book examples). That shape, however, depends critically on demand elasticity, which is not necessarily a constant and which may be different from one supplier market to another. With respect to smaller components, for example, small differences in price are unlikely to sway demand as demand is to a large extent a given, based on the number of aircraft of a particular model an LCA manufacturer has already sold. In a real-life monopoly situation, moreover, whether and how much pass-through occurs also depends, say Dorman and Terris, on a range of other factors, including the shape of the supply curve, economies of scale, learning curve effects and resource constraints.

324. Second, Dorman and Terris explain that even if one were to ignore such problems with the monopoly supplier assumption and assume that aerospace supplier markets actually conform to the simplified text book model, answering the question how much of any given subsidy may have passed-through would still require significant additional evidence (and may still be zero with respect to Boeing). Assume that all aerospace suppliers are monopolists and that any monopolist supplier would by definition pass-through the subsidy benefits in full. Boeing, Airbus and, depending on the supplied goods, perhaps others, would *each* benefit from the same alleged subsidy (if the supplier is a monopolist they would all have to source from it). To determine how much of the pass-through would flow to Boeing, how much to Airbus, and how much to others, would require further review of factors such as the volume of purchases of each, the price they pay, and the specific time period at issue. Alternatively, if a monopoly supplier sold only to Boeing and another monopoly supplier sold only to Airbus, and neither Airbus nor Boeing could switch to the other supplier, then the situation is one of bilateral monopoly. Dorman and Terris point out that economics teaches that the outcome under such a bilateral monopoly is indeterminate, so there is no basis for assuming that any particular portion of a subsidy would be passed through.

325. Against this general background, Dorman and Terris also explain – *viz.* question 393 (a) – that, for purposes of "pass-through", taxes and subsidies (sometimes referred to as "negative taxes") are not necessarily analogous. In certain simplified textbook models, a subsidy is a negative tax and analogous conclusions usually follow. More sophisticated models, however, explain Dorman and Terris, recognize differences in the characteristics of firms and markets in a particular industry. Because subsidies may affect firms' incentives differently from taxes, it is not a foregone conclusion that the theoretical predictions from taxes and subsidies would be analogous. Further fact-specific analysis would be required particularly in the case of complex, asymmetric oligopolies.

326. Finally, with respect to the Panel's request for evidence on the nature of the demand curve – question 393(b) – the United States refers to the discussion above and in the Dorman/Terris Report of the importance of demand elasticity, differentiated characteristics from one supplier market to another, and the relevance of other factors (such as the supply curve and

precise market structure). The United States is not aware of any studies on this issue with respect to aerospace suppliers.[417]

394. Do the parties agree that in the absence of availability of suitable data, the range of pass-through might nonetheless be narrowed down on the basis of theoretical considerations (e.g. pass-through by a monopolist under profit-maximizing behaviour being shown to be 50 percent independently of the level of marginal cost). Could these or similar deliberations lead to a "conservative" estimate of actual pass-through, absent better information?

327. The United States believes that it is not possible to narrow down, in any reasonable way, the range of possible "pass-through" scenarios on the basis of theoretical considerations alone.[418] Dorman and Terris put it even more bluntly and conclude that there is, on the basis of the evidence on the record, no basis (theoretical or empirical) to limit the range of likely pass-through outcomes to anything narrower than zero to 100 percent. The Dorman-Terris Report also recalls that the EC's assertion of 100 percent pass-through is unsupported on the facts, *e.g.*, because many Washington State suppliers have out-of-state competitors (who do not receive the alleged subsidy).

[417] Dorman-Terris Report, p. 6 (Exhibit US-1363).

[418] While theory-based estimates may be able to fill-in certain limited analytical gaps, a reliable estimate requires at least a certain basis in reality. As Dorman and Terris explain, at least certain key characteristics of the aerospace supplier markets at issue (structure, supply curve, demand curve and elasticity, etc.) would have to be established with some level of precision for a reasonable estimate to be possible.