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# AIRCRAFT NOISE REGULATION IN THE EUROPEAN UNION: THE HUSHKIT PROBLEM

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## I. INTRODUCTION

**T**HE AVIATION industry has changed tremendously since the seventies. The doubling in air traffic volume coupled with increased airport congestion awakened the aviation industry to the adverse impact of aviation on the environment. Emissions of pollutants, such as hydrocarbons, carbon monoxide, and nitrogen oxide, and increasing noise pollution in the vicinity of airports represent the clearest examples of how air traffic threatens the environment.<sup>2</sup>

Simultaneously, national and international bodies realized the limits of total trade liberalization and recognized the importance of protecting the environment. Both within the former General Agreements on Tariffs and Trade ("GATT") framework

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\*\* Please be aware that this article is up-to-date as of the end of March 2000. Because this is a continually changing area of law, portions of this article may require updating.

<sup>1</sup> The author wishes to thank Professor Allan I. Mendelsohn, Professor Warren L. Dean, Jr., Ms. Heather L. Miller, and Mr. Ignacio López de Romaña for their helpful comments. This article also benefits from discussions with Monique Tousseyn and Laurent Muschel of the Transport Directorate of the European Commission, Nathalie Marchioro of ACI-Europe, and Richard Marchi of ACI-North America. The views expressed, however, are exclusively those of the author.

<sup>2</sup> See Robert V. Garvin, *Aircraft Engines and the Environment: Cleaner and Quieter is the Promise of the Nineties*, in AIR TRANSPORT AND POLICY IN THE 1990s 53, 53-60 (Pablo Mendes de Leon ed., 1991).

and the current World Trade Organization ("WTO") structure, policymakers increasingly consider environmental issues.<sup>3</sup>

In response to the growing willingness to prioritize the maintenance of a sound environment for present and future generations,<sup>4</sup> the aviation industry was adamant about addressing these poignant "aviation-induced" environmental problems within the framework of the International Civil Aviation Organization ("ICAO").

Notwithstanding the actions taken by ICAO to address the problem of aircraft engine noise by adopting international noise standards in Volume I of Annex 16 to the Convention on International Civil Aviation ("Chicago Convention"),<sup>5</sup> the growing noise pollution around Community airports prompted the European Union ("EU")<sup>6</sup> to take even more stringent measures.

In April 1998, the Commission of the European Union<sup>7</sup> submitted a proposal<sup>8</sup> for a regulation aimed at precluding certain certificated aircraft from serving Community airports as of April

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<sup>3</sup> "The Preamble to the WTO Agreement includes direct references to the objective of sustainable development and the need to protect and preserve the environment. The new Agreements on Technical Barriers to Trade ("TBT Agreement") and on Sanitary and Phytosanitary measures take explicitly into account the use of governments of measures to protect human, animal and plant life and health and the environment." See Background to WTO work on the trade and environment (visited Mar. 14, 2000) <<http://www.wto.org/wto/environment/backgrou.htm>>.

<sup>4</sup> Principle 3 of the Rio Declaration provides: "The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations." *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF. 151/5/Rev. 1, 14 June 1992, adopted 14 June 1992, reprinted in 31 I.L.M. 874 (1992).

<sup>5</sup> See Convention on International Civil Aviation, Dec. 7, 1944, 61 Stat. 1180, 15 U.N.T.S. 295 [hereinafter "Chicago Convention"].

<sup>6</sup> The European Union was formally created by the Treaty on the European Union (TEU), agreed and signed on February 7, 1992, and entered into force on November 1, 1993. The Union has a tripartite structure: (1) the three European Communities (the European Community, the European Coal and Steel Community, and the European Atomic Energy Community), (2) the Common and Foreign and Security Policy (CFSP), and (3) the Co-operation in the field of Justice and Home Affairs (JHA).

<sup>7</sup> The European Commission is generally regarded as "the executive branch" of the European Community and fulfils three major functions: (1) participation in policy making by the Council (possessing the right of initiative to propose new legislation), (2) administrative function, and (3) supervisory function.

<sup>8</sup> See Commission Proposal for a Council Directive on the Registration and Operation within the Community of Certain Types of Civil Subsonic Jet Aeroplanes Which Have Been Modified and Recertificated as Meeting the Standards of Volume I, Part II, Chapter 3 of Annex 16 to the Convention on International Civil Aviation, 3d ed. (July 1993), 1998 O.J. (C 118) 20 and 1998 O.J. (C 329) 10.

1, 2002. The types of aircraft targeted are older aircraft that have been "recertificated" to comply with the noise standards of Chapter 3<sup>9</sup> of Volume I of Annex 16 to the Chicago Convention. Recertificated aircraft includes hushkitted aircraft, aircraft that meet the Chapter 3 standard through operational restrictions (weight restrictions or reduced flap settings), and aircraft re-engined with an engine that has a bypass ratio ("BPR")<sup>10</sup> lower than 3.<sup>11</sup>

On April 29, 1999, the Council of the European Union adopted the Regulation (the "Regulation")<sup>12</sup> but indicated that it would "postpone the date of application of the Regulation by one year in order to facilitate the continuation and the conclusion of the consultations with the United States."<sup>13</sup>

The Regulation subjects aircraft registered in an EU Member State to the non-addition rule. This rule prohibits Member States from adding recertificated aircraft to their registers as of May 4, 2000. Nevertheless, an aircraft registered in any Member State before May 4, 2000, which has been registered in the Community ever since, will not be affected by the non-addition rule.<sup>14</sup> EU aircraft can also be added to another EU Member State's registry while non-EU aircraft cannot.

In addition, the Regulation introduces a non-operation rule, aimed both at EU and third country carriers. Under the non-operation rule, re-certificated aircraft are prohibited from operating in the territory of the Community as of April 1, 2002, unless they meet two conditions. These conditions require the operator of an airplane to prove (1) that the plane was on the

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<sup>9</sup> "Chapter 2" and "Chapter 3" are the ICAO terms used outside the United States while "Stage 2" and "Stage 3" are terms used by the United States and both essentially refer to the same principles.

<sup>10</sup> "Bypass ratio" (BPR) is an expression that relates the total mass of air drawn into the engine to that portion of air that is used in the energy-release process of burning fuel in the high-pressure core of the engine.

<sup>11</sup> See Corrigendum to Council Regulation (EC) No 925/1999 of 29 April 1999 on the Registration and Operation Within the Community of Certain Types of Civil Subsonic Jet Aeroplanes Which Have Been Modified and Recertificated as Meeting the Standards of Volume I, Part II, Chapter 3 of Annex 16 to the Convention on International Civil Aviation, 3d ed. (July 1993) 1999 O.J. (L 120) 46, Art. 2.2 [hereinafter "Regulation"].

<sup>12</sup> See *id.*

<sup>13</sup> Statement by the Council and the Commission joined to the Regulation, adopted during the Industry Council on April 29, 1999 (visited Mar. 14, 2000) <<http://ue.eu.int/newsroom/main.cfm?LANG=1>> (This statement can be found by searching for "hushkit." Currently listed as "2174.COUNCIL-INDUSTRY.").

<sup>14</sup> See Regulation, Art. 3.2, *supra* note 11, at 49.

register of that third country on May 4, 2000, and (2) that it operated in the Community between April 1, 1995, and May 4, 2000.<sup>15</sup> To put EU aircraft at the same level as third country aircraft, Article 3.4 imposes the same non-operation obligation on EU aircraft.

The EU believes that the older planes, originally certificated to meet the Chapter 2 standard and modified to improve their noise certification level, not only cause more noise pollution but also cause more gaseous emissions,<sup>16</sup> and consume more fuel<sup>17</sup> than modern aircraft originally certificated to meet the Chapter 3 standard.<sup>18</sup>

The growth of civil aviation in Europe<sup>19</sup> depends upon the aviation industry's ability to progressively reduce the noise of each individual aircraft movement since almost every airport in Europe is at full noise capacity.<sup>20</sup> Recertificated aircraft disproportionately increase the cumulative noise load around Community airports and, accordingly, take up more noise capacity at European airports than the modern "state of the art" aircraft. By preventing the use of this older and noisier recertificated aircraft after April 2002, the Regulation is believed to create additional growth opportunity for the aviation industry by freezing the number of recertificated aircraft at their 2000 level.<sup>21</sup>

The United States strongly opposes the Regulation claiming it would discriminate against U.S. carriers, hushkit and engine manufacturers, and cost the U.S. industry at least two billion dollars.<sup>22</sup> In particular, the United States Government argues that hushkits reduce the noise emissions sufficiently and comply with ICAO standards.

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<sup>15</sup> See Regulation, Art. 3.3, *supra* note 11, at 49.

<sup>16</sup> See *infra* Part II.B.1.c.

<sup>17</sup> See *id.*

<sup>18</sup> See Regulation, Preamble ¶ 5, *supra* note 11, at 47.

<sup>19</sup> See Assad Kotaite, Presentation by the President of the Council of the International Civil Aviation Organization (ICAO), Dr. Assad Kotaite, of the Annual Reports of the Council for 1995, 1996, 1997 and the Supplementary Report for the First Six Months of 1998 During the 32nd Session of the Assembly (visited on Feb. 1, 2000) <[http://www.icao.int/icao/en/a32pres\\_arsp.htm](http://www.icao.int/icao/en/a32pres_arsp.htm)> (stating that the ICAO member states' airlines are experiencing an average annual growth rate of eight percent).

<sup>20</sup> See ACI Europe, *ACI Europe Position on Hushkitted Aircraft*, Nov. 18, 1999.

<sup>21</sup> See *id.*

<sup>22</sup> See *Congress Threatens No Stage 4 Agreement Unless EU Drops Hushkit Ban*, AIRLINE FIN. NEWS, Sept. 27, 1999.

For several months now, the United States has called on the EU to rescind the hushkit Regulation. Failure to repeal the Regulation could lead not only to the ban of the non-Stage 3 Concorde<sup>23</sup> but could also jeopardize further negotiations within ICAO on the next generation of noise standards, the so-called Chapter 4 standard, that would answer the long-term needs of citizens who live near to airports.<sup>24</sup>

On July 22, 1999, the U.S. Senate passed a resolution<sup>25</sup> to push the U.S. State Department to lodge a complaint with ICAO against the EU under Article 84 of the Chicago Convention so that the top rulemaker in commercial aviation would rule on whether the Regulation complies with international aviation standards.<sup>26</sup> In addition, on September 23, 1999, the Aviation Subcommittee of the House Committee on Transportation and Infrastructure drafted and approved a resolution<sup>27</sup> that reiterates the Senate's resolution and threatens to stop working on the establishment of a Stage 4 noise abatement standard if the hushkit Regulation is not rescinded.<sup>28</sup>

No major progress has been made during the last months of 1999 and the beginning of 2000. On the contrary, persistent in their points of views, the parties seem to head straight for conflict. On several occasions the EU offered to postpone the May 4 deadline and delay the implementation of the Regulation until at least September 2001, after the ICAO General Assembly, in the hope that the United States will agree on the Chapter 4 standard which will render the EU hushkit Regulation obsolete.<sup>29</sup> Because the EU believes that it is very unlikely that the U.S. aviation industry will be in favor of a new noise standard that is even

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<sup>23</sup> See H.R. 661, 106th Cong. (1999) (prohibiting the operation of the Concorde in the United States if the European Union does not rescind the hushkit Regulation); see also Matthew Newman, *EU Says Could Delay Ban On Aircraft "Hush Kits"*, DOW JONES NEWS SERV., Oct. 7, 1999; *Senate Wants ICAO to Rule on Validity of Europe's Hushkit Ban*, AVIATION DAILY, July 29, 1999, at 1.

<sup>24</sup> See Paul Mann, *U.S. May Up Hushkit Skirmish*, AVIATION WK. & SPACE TECH., Jan. 1, 2000, at 30.

<sup>25</sup> See Unanimous-Consent Agreement, Amendment No. 1342, 145 CONG. REC. S9046, S9048 (1999).

<sup>26</sup> See *Senate Wants ICAO To Rule On Validity Of Europe's Hushkit Ban*, AVIATION DAILY, July 29, 1999, at 1.

<sup>27</sup> See H. R. Con. Res. 187, 106th Cong. (1999).

<sup>28</sup> See *Congressional Committee Fires First Shot in Airport Noise Battle*, WORLD AIRPORT WK., Sept. 28, 1999.

<sup>29</sup> *European Airports Champion Ban on Chapter 2 Aircraft*, COMMUTER/REGIONAL AIRLINE NEWS, Jan. 3, 2000.

stricter than the one set by the hushkit Regulation,<sup>30</sup> the EU is willing to withdraw the Regulation only if the United States gives a written commitment to support the adoption of the stricter Chapter 4 noise standard. The United States, however, says that it is not willing to negotiate under duress<sup>31</sup> and that writing the criteria and definition of the Stage 4 standard would render the current aircraft equipment prematurely obsolete.<sup>32</sup>

Because the United States has not given any firm commitment to develop the Chapter 4 standard, the EU intends to keep the Regulation in place until the General Assembly of ICAO meets in September 2001.<sup>33</sup> Loyola de Palacio,<sup>34</sup> the new vice-president of the European Commission who is also in charge of energy and transport policy, points out that even if the EU would be willing to delay the implementation of the Regulation, the delay would be complicated by the new Treaty of Amsterdam, under which many regulations not only require approval from the 15 EU Member States but also from the European Parliament. Because the European Parliament has the reputation of being much "greener" than the EU governments, a Commission decision delaying the application of the Regulation for at least another year could be seriously jeopardized.<sup>35</sup>

In order to get out of the current deadlock situation, the State Department is expected to effectively lodge a complaint with the ICAO in mid-March.<sup>36</sup> Once the ICAO receives the complaint it will review the legal arguments, translate the complaint into six United Nations languages and distribute it to the 33 members of the ICAO Council. The EU will have 90 days for a rebuttal and

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<sup>30</sup> See Paul Mann, *Diplomacy Takes Hold In Hushkit Squabble—Washington and Brussels Jockey for Advantage in Their Dispute Over Aircraft Noise Reduction*, AVIATION WK. & SPACE TECH., Sept. 20, 1999, at 45.

<sup>31</sup> Geoff Winestock, et al., *A Special Background Report on European Union Business and Politics*, WALL ST. J. EUR., Nov. 18, 1999, at 1.

<sup>32</sup> See Mann, *supra* note 24, at 30.

<sup>33</sup> See *European Commission Welcomes New Prospects for Progress on Stricter Aircraft Noise Abatement*, PR NEWswire, Oct. 7, 1999; see also Mann, *supra* note 24, at 30.

<sup>34</sup> As of September 17, 1999, a new European Commission was confirmed in office. The function of Commissioner for Transport, previously held by Neil Kinnock, was taken over by Loyola de Palacio. Ms. Loyola de Palacio serves as vice-president of the European Commission as well as Commissioner for Transport and Energy.

<sup>35</sup> See Geoff Winestock & Brandon Mitchener, *U.S., EU Face Deadline on American Planes - Noise-Pollution Regulation Could Bar Many Aircraft From European Skies*, WALL ST. J., Oct. 11, 1999, at A18.

<sup>36</sup> The author completed this Article during February 2000 and accordingly does not yet know the outcome of the above-mentioned complaint.

then ICAO will decide how to proceed, with mediation or a full trial being two of the range of options available.<sup>37</sup> A decision for the United States could force the EU to drop the hushkit Regulation or effectively give up its voting rights within ICAO.<sup>38</sup> In retaliation for the United States filing the Article 84 complaint, the EU has threatened to enact the ban immediately reducing the likelihood of a settlement even more.<sup>39</sup>

The goal of this paper is to assess the compatibility of the Regulation with the international obligations of the EU and/or its Member States under existing multilateral and bilateral agreements.<sup>40</sup>

Part I provides background information on the dispute, beginning with a brief explanation of how aircraft noise is generated and ending with a discussion on how international treaties, such as the Chicago Convention, or international organizations, such as the EU, have tried to solve this problem.

Part II summarizes the positions of the United States government and the European Union with regard to the legality and defensibility of the Regulation and provides two aircraft noise studies.

Part III gives an overview of problems faced by airports in the EU and the U.S.

Part IV looks at the compatibility of the Regulation with the Agreement on Technical Barriers to Trade ("TBT Agreement")<sup>41</sup> and with the General Agreement on Trade in Services ("GATS").<sup>42</sup>

Part V examines whether the EU and its Member States are complying with their Chicago Convention obligations and their

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<sup>37</sup> Kristin S. Krause, *Line in the Sand*, TRAFFIC WORLD, Feb. 7, 2000.

<sup>38</sup> James Cox, *Hush Kit Ban Raises Ante in U.S.-EU Trade War*, USA TODAY, Dec. 23, 1999, at 3B.

<sup>39</sup> See Krause, *supra* note 37.

<sup>40</sup> The author does not examine in detail the technical side of this problem, except where technical reports and findings are inextricably linked to the discussion of legal issues.

<sup>41</sup> Agreement on Technical Barriers to Trade, GATT Doc. MTN/FA II-AIA-6 (Dec. 15, 1993), in Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, GATT Doc. MTN/FA (Dec. 15, 1993), reprinted in 33 I.L.M. 9 (1994).

<sup>42</sup> General Agreement on Trade in Services, Doc. MTN/FA II-AIB (Dec. 15, 1993), in Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, Doc. MTN/FA (Dec. 15, 1993) reprinted in 33 I.L.M. 44 (1994).



bilateral obligations with the United States by enacting the Regulation.

Part VI proposes several alternatives and/or modifications to the Regulation in order to make it (more) compatible with the international obligations of the EU under the Chicago Convention, the bilateral air services agreements, and the TBT Agreement.

## I. BACKGROUND

### A. AIRCRAFT NOISE

Aircraft noise heard on the ground comes from three different sources. First, the noise is a mixture of sources originating within the aircraft engines and those produced by the jet exhausts, where high-velocity gases are propelled into the atmospheric air ("jet noise").<sup>43</sup> An additional source of noise occurs on final approach to land, with the engines at low power and creating minimum noise. At that moment, aerodynamic disturbances caused by the deployment of the flaps and undercarriage produce a significant source of "airframe" noise.<sup>44</sup>

The noise generated within the engine is mainly high-frequency whereas the jet noise and the airframe noise are low-frequency.<sup>45</sup> Low-frequency noise sources travel large distances from the aircraft and are noticed most by people living in airport surroundings.<sup>46</sup>

The intensity of the noise from a jet is a function of jet velocity to a high power, which is typically around eight. A halving or doubling of jet velocity, therefore, can be responsible for a change of some twenty decibels ("dB") in source noise output, equivalent to a fourfold change in loudness or annoyance. Engine bypass ratio ("BPR")<sup>47</sup> dictates the velocity of the jet exhaust flow and is fundamental to the production of noise in the mixing process with the atmosphere. Efficiency increases and jet exhaust noise decreases for normal subsonic flight opera-

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<sup>43</sup> See *Planes Getting Quieter; Noise Standard in Effect Jan. 1*, CINCINNATI POST, Dec. 21, 1999, at 7A; see also M.J.T. Smith, Final Report, Study on the Assessment of the Environmental Performance of Recertificated Chapter 3 Aircraft Compared to Aircraft Initially Manufactured to Chapter 3 Standards: Recertificated Aircraft and the Environment: An Opinion 10 (April 1999) (unpublished study, on file with the European Commission).

<sup>44</sup> See Smith, *supra* note 43, at 10.

<sup>45</sup> See *id.*

<sup>46</sup> See *id.*

<sup>47</sup> For a definition, see *supra* note 10.

tions as bypass ratio increases, and less fuel is used by unit of overall thrust.<sup>48</sup>

## B. THE EFFECTS OF AIRCRAFT NOISE ON HUMAN HEALTH

There is ample medical evidence that excessive noise in general, and aerial noise in particular, cause mental disorders and other detrimental psychological effects on human beings.<sup>49</sup> Specifically, aircraft noise leads to an increase in chronic fatigue and neurotic complaints.<sup>50</sup> Indeed, some studies have found that the blood pressure and stress-related cholesterol levels rise and irritability and fatigue increase when someone is exposed to excessive noise levels for several hours.<sup>51</sup> In addition, according to one study, children exposed to frequent aircraft noise at school did not learn as well as other children who go to school in a quieter environment.<sup>52</sup>

## C. THE REGULATION OF AIRCRAFT NOISE

The regulation of aircraft noise can take place at various 'political' levels (internationally, nationally, or at a local level by airport communities) and at three different stages:

(a) limitations on the certification of new designs and engines are used to control and restrain the manufacturers (non-production rule);

(b) national legislation may introduce restrictions on the acquisition and/or on the registration of noisy aircraft by their airlines (non-addition rule);

(c) airlines may be prevented from operating noisy aircraft or be subject to some form of noise restriction (daily time curfews, for example) by local airport regulations (non-operation rule).<sup>53</sup>

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<sup>48</sup> See Smith, *supra* note 43, at 11.

<sup>49</sup> See R.I.R. Abeyratne, *Aircraft Engine Emissions and Noise*, 24 ENVTL. POL'Y & L. 238, 241 (1994).

<sup>50</sup> See ALEXANDER COHEN, *NOISE AND PSYCHOLOGICAL STATE* 25 (1968); see also Donald V. Harper, *Regulation of Aircraft Noise at Major Airports: Past, Present, and Future*, 17 TRANSP. L.J. 117, 121 (1988).

<sup>51</sup> See Peter Gruner, *Now Hear This: Noises of the City Can Cause Heart Failure*, EVENING STANDARD-LONDON, Oct. 9, 1998, at 18.

<sup>52</sup> See *id.*

<sup>53</sup> CAROLE BLACKSHAW, *AVIATION LAW & REGULATION* 229-41 (1992).

1. *The International Regulation of Aircraft Noise: The Chicago Convention*

Given the enormous importance of air transport during the Second World War, nations realized that the development of uniform rules in international civil aviation was necessary to secure international peace. At the initiative of the United States Government, an International Civil Aviation Conference was held in Chicago in November 1944. The Convention on International Civil Aviation ("Chicago Convention")<sup>54</sup> was adopted at this meeting. National security reasons and economic protectionism made absolute state sovereignty,<sup>55</sup> as well as the equal right of all signatories to participate in international air transportation,<sup>56</sup> the core principles of the Chicago Convention.<sup>57</sup>

The Chicago Convention introduced guidelines for flight over the territory of signatory States, aircraft nationality and ownership as well as air navigation rules.<sup>58</sup> The Chicago Convention also created the International Civil Aviation Organization ("ICAO") to foster the planning and development of international air transport.

ICAO created the Committee on Aviation Environmental Protection ("CAEP")<sup>59</sup> in 1983 primarily to address environmental problems connected with the increasing significance of air transport. CAEP is also charged with making recommendations regarding noise and emissions to the Council of ICAO.<sup>60</sup>

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<sup>54</sup> See Chicago Convention, *supra* note 5.

<sup>55</sup> See Chicago Convention, Art. 1, *supra* note 5.

<sup>56</sup> See Chicago Convention, Art. 44 (f), *supra* note 5.

<sup>57</sup> See Andras Vamos-Goldman, *The Stagnation of Economic Regulation Under Public International Air Law: Examining Its Contribution to the Woeful State of the Airline Industry*, 23 TRANSP. L.J. 425, 430-434 (1996); see also Benoit M.J. Swinnen, *An Opportunity for Trans Atlantic Civil Aviation: From Open Skies to Open Markets?*, 63 J. AIR L. & COM. 249, 254 (1997).

<sup>58</sup> See Heather L. Miller, *Civil Aircraft Emissions and International Treaty Law*, 63 J. AIR L. & COM. 697, 706 (1998).

<sup>59</sup> The Member States participating in the Committee on Aviation Environmental Protection (CAEP) are: Australia, Brazil, Canada, Egypt, France, Germany, Italy, Japan, the Netherlands, Poland, the Russian Federation, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States. The Observers in CAEP are: Greece; Airports Council International-ACI; Arab Civil Aviation Commission-ACAC; Commission of the European Communities-EC; International Air Transport Association-IATA; International Coordinating Council of Aerospace Industries Associations-ICCAIA; International Federation of Air Line Pilots' Associations-IFALPA; World Meteorological Organization-WMO. See *Committee on Aviation Environmental Protection* (visited Jan. 16, 2000) <<http://www.icao.org/icao/en/env/CAEPMEM.HTM>>.

<sup>60</sup> See Miller, *supra* note 58, at 714.

The Council, which is the governing body of ICAO, adopts International Standards and Recommended Practices ("SARPs"). SARPs are subsequently incorporated into Annexes to the Chicago Convention.<sup>61</sup> SARPs relating to environmental aspects of aviation were first adopted on April 2, 1971, and designated as Annex 16 to the Chicago Convention, entitled "Environmental Protection."<sup>62</sup> Annex 16 was adopted following the recommendations of the "Special Meeting on Aircraft Noise in the Vicinity of Aerodromes," held in 1969.<sup>63</sup> Volume I of Annex 16 includes provisions for the uniform measurement of aircraft noise levels and noise certification standards that govern any aircraft currently built. Volume II sets forth aircraft engine emissions standards.

Volume I of Annex 16 distinguishes jet-powered aircraft along three levels of stringency. Chapter 1 refers to non-noise certificated ("NNC") airplanes and includes all aircraft that cannot comply with Chapter 2 standards, including most types of Boeing-707, McDonnell Douglas DC-8, Convairs, Caravelles, and Tridents. Most of these airplanes are obsolete in many parts of the world because of age and because they do not comply with current noise regulations.<sup>64</sup>

Chapter 2 of Volume I of Annex 16 introduces the first noise stringency standards. It applies to brand-new first-time certificated jet aircraft, i.e., aircraft for which the application for a certificate of airworthiness for the prototype was accepted (the so-called prototype certification) or another equivalent procedure had been carried out before October 6, 1977. Several aircraft types receive exceptional treatment under Chapter 2. The "effective perceived noise level" (EPNdB) measures the noise level, and Chapter 2 precludes aircraft from exceeding a certain maxi-

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<sup>61</sup> See Chicago Convention, Art. 34, 54(1), *supra* note 5, at 1189, 1197.

<sup>62</sup> See Abeyratne, *supra* note 49, at 242.

<sup>63</sup> See Jeffrey Goh, *Problems of Transnational Regulation: A Case Study of Aircraft Noise Regulation in the European Community*, 23 TRANSP. L. J. 277, 284 (1995).

<sup>64</sup> The U.S. introduced an operational ban on Stage 1 aircraft effective January 1, 1985, while most European countries banned Chapter 1 aircraft effective January 1, 1988. Unlike the U.S., many European countries granted exemptions to developing countries until December 31, 1989. See Council Directive 83/206/EEC of 21 April 1983 amending Directive 80/51/EEC on the Limitation of Noise Emissions from Subsonic Aircraft, 1983 O.J. (L 117) 15; see also, 14 C.F.R. part 91, Subpart I, Operating Noise Limits, Sec. 91.805.

imum EPNdB at specific moments. Chapter 2 also contains detailed technical procedures to calculate these noise standards.<sup>65</sup>

Chapter 3 applies more stringent standards to aircraft designed after October 6, 1977. Accordingly, many aircraft do not meet these standards. For example, Chapter 3 excludes Boeing-727s, Boeing-737-200s, McDonnell Douglas DC-9s and Boeing-737-100s.<sup>66</sup>

The EU is of the opinion that the Chapter 3 standard, which was adopted more than twenty years ago (1977), no longer reflects the latest engine technology. Indeed, according to ICAO CAEP/3, the purpose of noise certification is "to ensure that the latest available noise reduction technology is incorporated into the aircraft design."<sup>67</sup> The noise limits contained in the Chapter 3 standard have not been adapted during the past twenty years despite the spectacular improvements in engine noise control that now provide substantially lower noise levels.<sup>68</sup> Apparently, aircraft are manufactured today that are twenty three dB quieter than the baseline Chapter 3 standard.<sup>69</sup>

In 1990, the ICAO General Assembly adopted a resolution allowing states that have noise problems to start phasing out operations by Chapter 2 aircraft between 1995 and 2002.<sup>70</sup> In addition, at the request of several environmental groups and local airport communities, the EU significantly pressured the other parties of ICAO to make the current Chapter 3 standard more stringent. Between 1992 and 1998, all progress on this issue had been halted primarily by the United States and the African States.<sup>71</sup> Contrary to the EU's expectations and despite three years of preparatory technical work, the members of CAEP/3 were unable to reach a consensus on a new noise stan-

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<sup>65</sup> For a detailed discussion on the noise certification process, see Troy A. Rolf, *International Aircraft Noise Certification*, 165 J. AIR L. & COM. 383 (2000).

<sup>66</sup> See BLACKSHAW, *supra* note 53, 238-39.

<sup>67</sup> ICAO COMMITTEE ON AVIATION ENVIRONMENTAL PROTECTION, THIRD MEETING, ¶ 1.5.6 (1995) [hereinafter CAEP/3].

<sup>68</sup> See Smith, *supra* note 43, at 5-6.

<sup>69</sup> See Philippe Harmon, Letters to the Editor, *Put a Muffler on That Plane*, WALL ST. J. EUR., Oct. 12, 1999, at 11.

<sup>70</sup> See ICAO, *Aircraft Noise*, (visited Jan. 16, 2000) <<http://www.icao.int/icao/en/env/noise.htm>>.

<sup>71</sup> See European Commission, Transport Directorate-general, *Information Pack - Aircraft Noise: The Recertificated Aircraft Regulation*, 1-16, Aug. 26, 1999, at 1-16 [hereinafter *Information Pack*].

dard.<sup>72</sup> The EU claims that the United States requested that this issue not be given priority on CAEP's work agenda.<sup>73</sup>

In conclusion, the international aviation community has merely reached a consensus allowing member states to restrict the operation of all aircraft that do not meet the Chapter 3 standard, as of April 1, 2002.<sup>74</sup> Due to the lack of progress within CAEP, however, the international aviation community has yet to agree on a policy to reduce noise after the 2002 deadline. Indeed, at the last CAEP/4 meeting in 1998, no agreement was reached on the future Chapter 4 noise standards.<sup>75</sup> Taking into account the current heightened tensions between the United States and the EU, it remains to be seen whether the CAEP member states will be able to agree on the stricter Chapter 4 noise standard at the next ICAO General Assembly in September 2001.

## 2. *The Problem and the Regulation of Aircraft Noise within the European Union*

### a. *The Aircraft Noise Problem in the European Union*

European citizens are increasingly protesting against the rising noise pollution around Community airports, which are often located close to densely populated urban communities.<sup>76</sup> Indeed, Europe has far worse noise problems than the United States so the issue of stricter noise standards is more poignant.<sup>77</sup> Even Congressman James Oberstar (D-Minn.), one of the acknowledged aviation specialists on Capitol Hill, recognized that Europe's comparative shortage of geographic space compels Europe's urban population to live closer to airports than do U.S. citizens.<sup>78</sup>

According to Dave Tompkins, head of operations for the United Kingdom's Civil Aviation Authority, governments ur-

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<sup>72</sup> See ICAO, *ICAO 32nd Assembly - Report of the Executive Committee*, (visited Jan. 16, 2000) <<http://www.icao.int/icao/en/env/a32report.htm>> [hereinafter ICAO Executive Committee].

<sup>73</sup> See *Information Pack*, *supra* note 71.

<sup>74</sup> See ICAO, *Resolutions Adopted at the 32nd Session of the Assembly*, Resolution A32-8-App. D (visited Jan. 16, 2000) <<http://www.icao.int/icao/en/a32/resolutions.pdf>>.

<sup>75</sup> See ICAO Executive Committee, *supra* note 72.

<sup>76</sup> For example, the French National Association Against Aircraft Noise and Pollution.

<sup>77</sup> See Lori Lessner, *European Efforts to Regulate Airplane Noise Spark U.S. Outcry*, WICHITA EAGLE, Sept. 18, 1999.

<sup>78</sup> See Mann, *supra* note 30, at 45-46.

gently need to take steps to quiet aircraft since almost every European airport is at capacity. If the noise is not dealt with adequately, Tompkins fears that individual airports will take action since noise abatement measures are urgently necessary to allow airports to implement their expansion plans.<sup>79</sup>

In addition, Airports Council International Europe ("ACI-Europe"), which represents 450 commercial airports in Europe, fully supports the enforcement of the EU's Regulation<sup>80</sup> and also considers the Regulation to be necessary for the growth of the aviation sector.<sup>81</sup>

Accordingly, the threat is that if the EU did not enact the current measure, individual Member States, at the request of local airport communities, might unilaterally impose noise restrictions that threaten the European market as a single economic entity in the field of civil aviation.<sup>82</sup> Several countries have already taken such unilateral measures. For example, in August 1996, the UK Government decided unilaterally to impose noise limits at three London airports: Heathrow, Gatwick, and Stansted.<sup>83</sup> Similarly, on October 21, 1996, the Italian Environment Ministry introduced a series of similar measures aimed at quelling noise around the airports of Fiumicino in Rome and Malpensa in Milan. Another more recent example of such unilateral action is the Belgian Government's decision of early February to reduce aircraft noise for takeoffs between 11 p.m. and 6 a.m. by thirty percent by July 2003.<sup>84</sup> Other countries in Eu-

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<sup>79</sup> *Stage 4 Noise Restriction Will Be Law Sooner Than Later*: FAA, AIRLINE FIN. NEWS, Sept. 20, 1999.

<sup>80</sup> See Statement Approved by the Board of ACI Europe at Their Meeting in Vienna on 20 January 1999, European Airports support Community initiative to restrict the use of hushkitted aircraft, Feb. 4, 1999; see also Harmon, *supra* note 69.

<sup>81</sup> See Pollution Online, *European Airports Agree With EU on Hush Kit Ban* (visited Jan. 31, 2000) <<http://news.pollutiononline.com/wires/article.asp?DocID={BC2AB848-F51B-11D2-A405-00C04F7C39}>>.

<sup>82</sup> See European Union, *EU Transport Ministers Postpone Hushkit Issue* (visited Jan. 31, 2000) <<http://www.eurunion.org/news/press/1999/1999014.htm>>.

<sup>83</sup> See Dr. Pablo Mendes de Leon, *Aviation and the Environment: Changing Perceptions*, 22 AIR & SPACE L. 131, 131 (1997).

<sup>84</sup> Nancy Nackaerts, Belgian Govt To Reduce Aircraft Noise By 30% By July 2003, DOW JONES NEWS SERV. Feb. 11, 2000. Early January 2000, Belgian's transport minister, Isabelle Durant, had published a draft law banning all flights to and from Brussels airport between 1 am and 5 am as of 2003. Due to fierce protest from DHL, which has its world-wide headquarters and European airfreight hub in Brussels, and other cabinet members, Ms. Durant had to withdraw the draft bill. The government nevertheless decided to introduce measures to curb aircraft noise at Brussels National Airport. The Government plans to phase in noise quotas on nighttime flights that will become gradually stricter. See John

rope, such as Germany, Sweden, the Netherlands, and Denmark took, or are intending to take, similar unilateral actions.<sup>85</sup>

As mentioned above, the EU has been advocating the adoption of stricter noise standards within ICAO since 1992. Because no progress has been made so far, and in response to strong environmental pressures within the fifteen Member States, especially in Belgium, Ireland, the Netherlands, Austria, and Spain,<sup>86</sup> the EU decided to at least restrain hushkitted aircraft from disproportionately taking up noise capacity at Europe's airports.

b. The Regulation of Aircraft Noise within the European Union

The Regulation represents another step in the EU's continuous effort to combat the detrimental effect of noise on the environment. As early as 1973, the EU adopted its first environmental action program. The program officially recognized noise as a severe environmental problem.<sup>87</sup> The fifth action program of 1992 on the environment supports the adoption of further measures aimed at reducing noise emissions from aircraft.

The acknowledgment of aircraft noise as a serious source of noise pollution led to the adoption of four European directives.<sup>88</sup> These Directives were all enacted with a view to implementing the ICAO standards, contained in Volume I of Annex 16.<sup>89</sup>

Concerned that the air transport industry is growing faster than the technological and operational devices designed to reduce its harmful environmental effects, Loyola de Palacio and Environment Commissioner Margot Wallstrom announced in December 1999 a framework for a new environmental policy to improve environmental standards, in particular noise and emission pollution.<sup>90</sup>

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Carreyrou, *Brussels Tempers Flight Ban—DHL Welcomes New Government Measures To Curb Aircraft Noise at Night*, WALL ST. J., Feb. 14, 2000.

<sup>85</sup> See Mendes de Leon, *supra* note 83 at 131.

<sup>86</sup> See *Europe Considers Delaying Hushkit Ban*, AVIATION DAILY, Oct. 7, 1999, at 1.

<sup>87</sup> See Goh, *supra* note 63, at 286.

<sup>88</sup> See Council Directive 80/51/EEC, 1979 O.J. (L 18) 26; Council Directive 83/206/EEC, 1983 O.J. (L 117) 15; Council Directive 89/629/EEC 1989 O.J. (L 363) 27; Council Directive 92/14/EEC, 1992 O.J. (L 76) 21, as amended by Council Directive 98/20/EC, 1998 O.J. (L 107) 4.

<sup>89</sup> See Goh, *supra* note 63, at 287.

<sup>90</sup> See *EU Commission Pushes Own Agenda*, WORLD AIRLINE NEWS, Dec. 3, 1999.



At airport level, aircraft noise will be addressed through the creation of a Community framework on the noise classification of aircraft. This system tries to unify the levels of charges, currently being levied at some European airports to deter the use of noisy aircraft, by creating a common noise classification scheme. In addition, the Commission proposes a noise measurement index, a methodology for noise calculation and a minimum requirement for noise monitoring. The idea behind all this is to give preference to operations with quieter aircraft when defining priority criteria for re-allocation from the pool of slots.<sup>91</sup> The Commission hopes that a system of overall noise quotas at individual airports will push airlines to use quieter aircraft in order to obtain slots.<sup>92</sup>

### c. The Disputed EU Hushkit Regulation

The Regulation establishes conditions for registration and operation of recertificated aircraft in the European Community. According to Article 2 of the Regulation, recertificated aircraft includes aircraft initially certificated to Chapter 2 or equivalent standards, or initially not noise-certificated but modified through technical measures, including hushkits, engine modifications or other technical measures, or through operational restrictions, such as weight restrictions and reduced flap settings.<sup>93</sup> However, aircraft that have been modified to meet the Chapter 3 standard by being completely reengined with engines having a bypass ratio<sup>94</sup> of three or more are not to be considered as recertificated aircraft. *A contrario*, this means that aircraft reengined with engines having a bypass ratio of less than three are to be treated as recertificated aircraft.

The Regulation introduces a “non-addition” and a “non-operation” rule. The non-addition rule prohibits EU Member States from adding recertificated aircraft to their registers after May 4, 2000.<sup>95</sup> A recertificated aircraft, however, that was on the register of an EU Member State before May 4, 2000 can be transferred to the national register of another EU Member State

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<sup>91</sup> See Graham Dunn, *EC Details Plans for Tough Environmental Rules*, AIR TRANSPORT INTELLIGENCE, Dec. 3, 1999.

<sup>92</sup> See *id.*

<sup>93</sup> See Regulation, Art. 2.2, *supra* note 11, at 48.

<sup>94</sup> For a definition of bypass ratio, see *supra* note 10.

<sup>95</sup> See Regulation, Art. 3.1, *supra* note 11, at 49.

without losing its right to operate into the Community after April 1, 2002.<sup>96</sup>

The Regulation also introduces a non-operation rule. Under this rule, non-complying third country aircraft are prohibited from operating in the territory of the Community after April 1, 2002, unless the airline can prove that the aircraft was on the register of that third country on May 4, 2000, and had a history of Community operations between April 1, 1995, and May 4, 2000.<sup>97</sup> To ensure non-discriminatory treatment of all aircraft, the Regulation applies the same non-operation rule after April 1, 2002, to aircraft registered in an EC Member State,<sup>98</sup> except that transferred aircraft from the register of one Member State to another Member State is still allowed to operate.<sup>99</sup>

## II. THE EUROPEAN UNION VERSUS THE UNITED STATES

### A. SUMMARY OF THE PARTIES' POSITIONS

#### 1. *The United States's Position*

The United States Government, acting on behalf of its carriers, and hushkit and engine manufacturers, opposes the EU Regulation on several grounds:

##### a. Compatibility with the Chicago Convention

By unilaterally imposing a stricter noise standard than the standard specified in Chapter 3 of Volume I of Annex 16 to the Chicago Convention, the United States claims that the EU and its Member States are violating their obligations under the Chicago Convention and under the bilateral air services agreements concluded with the U.S.

In particular, the Regulation allegedly violates Article 33 of the Chicago Convention and similar articles of the bilateral air service agreements because it refuses to give universal recognition to U.S. certificates of airworthiness despite U.S. carriers' compliance with all current ICAO standards.

In addition, the United States claims that the measure gives Airbus, the European manufacturing consortium, a boost over

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<sup>96</sup> See Regulation, Art. 3.2, *supra* note 11, at 49.

<sup>97</sup> See Regulation, Art. 3.3, *supra* note 11, at 49.

<sup>98</sup> See Regulation, Art. 3.4, *supra* note 11, at 49.

<sup>99</sup> See Statement of the Council's Reasons, 1998 O.J. (c 404) 5, 5.

Boeing in aircraft sales<sup>100</sup> and favors EU carriers over U.S. carriers contrary to the non-discrimination obligation of Article 15 of the Chicago Convention and similar articles of the bilateral air services agreements, which oblige both parties to give each other's carriers a fair and equal opportunity to compete.

In particular, the transfer rule (as described above) would require EU carriers to buy second-hand aircraft from other Member States instead of from non-European carriers. Non-European carriers will refrain from buying older aircraft from U.S. carriers if such aircraft can no longer be operated in the territory of the EU. This diminishes the value of the commercial U.S. fleet and allegedly is contrary to the rationale of the standardization process carried out within the framework of ICAO (allowing a certain degree of comparability and interchangeability of air transport related products).<sup>101</sup>

#### b. The Shortened Phase-out of Chapter 2 Aircraft

The United States claims that the decision to phase out Chapter 2 aircraft by 2000 (15 months ahead of the April 2002 ICAO deadline)<sup>102</sup> had only a negligible effect on business decisions of U.S. air carriers whether or not to invest in hushkits or in more expensive, new technology engines. Contrary to the EU allegations, the United States asserts that the extra 15 months allowed by ICAO would not have induced U.S. carriers to invest in new aircraft rather than in lower cost hushkitted technology.

#### c. The Alleged Losses

The United States alleges that the Regulation has already cost American businesses \$2.1 billion (1.97 billion euros)<sup>103</sup> in spare parts and engine sales, reduced the commercial resale value of

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<sup>100</sup> See James Cox, *Hush Kit Ban Raises Ante in U.S.-EU Trade War*, USA TODAY, Dec. 23, 1999, at 3B.

<sup>101</sup> See Jacques Nusbaumer, *The GATT Standards Code in Operation*, 18 J. WORLD TRADE L. 542, 549 (1984).

<sup>102</sup> To combat aviation noise, the U.S. Congress passed Pub. L. No. 101-508, 104 Stat. 1388-378 (codified as 49 U.S.C. §§ 47521-33 (1994)). This law requires certain categories of aircraft to be fully Stage 3 compliant by December 31, 1999, 15 months ahead of the ICAO deadline.

<sup>103</sup> Aerospace Industries Association alleges that U.S. companies, including the Pratt & Whitney unit of United Technologies Corp., the Nordam Group, and B. F. Goodrich Co., have already suffered \$2.1 billion (1.97 billion euros) in airline fleet depreciation and lost sales as a result of the mere threat of the rule. In particular, Pratt & Whitney, the principal manufacturer of American-made hushkits, estimates that it will lose \$515 million in orders as a result of the EU

over 1,600 U.S. aircraft, and caused financial losses for U.S. hushkit manufacturers.<sup>104</sup> The internationally agreed aircraft certification scheme of ICAO assures investors of the worldwide marketability for the life of an aircraft. Despite the one year delay, the intended unilateral deviation by the EU from the ICAO certification scheme allegedly has already delayed substantial investments.

#### d. The Noise Issue

According to U.S. technical experts, aircraft equipped with hushkits would make far less noise than some originally certificated aircraft. In addition, the United States questions the validity of the criteria of a bypass ratio of 3 in order to distinguish between permitted and prohibited reengined aircraft.

#### e. Performance Standard Versus Design Standard

If the European Union is really concerned about the environmental pollution produced by aircraft, the United States argues that it should introduce a performance standard rather than a design standard, in compliance with the Agreement on Technical Barriers to Trade.

### 2. *The Position of the European Union*

The European Union presents several arguments to defend the validity of its Regulation.

#### a. Compatibility with the Chicago Convention

The EU claims that it did not violate the Chicago Convention or its bilateral air service agreements because it merely freezes existing noise levels around Community airports. Indeed, the measure only prevents countries from continuing to add aircraft to their registers that only marginally comply with the Chapter 3 standard. The Regulation, however, still allows such “noisy” air-

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ban. See *Congress Threatens No Stage 4 Agreement Unless EU Drops Hushkit Ban*, AIRLINE FIN. NEWS, Sept. 27, 1999.

<sup>104</sup> See Complaint of Northwest Airlines, Inc. against The Council of the European Union and the Governments of the 15 EU Member States before the Department of Transportation, Docket OST-99-; see also U.S. House Transp. & Infrastructure Comm., *Hollings, Oberstar Bills Would Halt Concorde Flights in U.S. Airspace—Action in Response to E.U. noise policy—House T&I Committee will mark-up Thursday*, (visited Jan. 28, 2000) <[http://www.house.gov/transportation\\_democrats/press/990210\\_concorde.htm](http://www.house.gov/transportation_democrats/press/990210_concorde.htm)>.

craft currently serving Community airports to further operate into the Community after April 1, 2002.

In addition, the recertification process of hushkitted aircraft is contrary to the purpose of the ICAO noise certification rules, i.e., to ensure that the latest available noise reduction technology is incorporated in the aircraft design.<sup>105</sup>

And last, because the non-operation rule applies both to EU and U.S. carriers, the EU claims that the Regulation does not violate Article 15 of the Chicago Convention or the "fair and equal opportunity to compete" obligation of the bilateral air services agreements.<sup>106</sup>

#### b. The Shortened Phase-out of Chapter 2 Aircraft

The EU argues that the U.S. administration has caused the difficulties that U.S. carriers are currently encountering by unilaterally anticipating the deadline to phase out Chapter 2 standard aircraft by 2000.<sup>107</sup> These stricter time limits pushed U.S. carriers to opt for the cheap hushkit solution rather than to invest in new, less noisy, more environmentally friendly aircraft.

In addition, the use of hushkits is not consistent with the purpose of the ICAO standard in terms of overall noise reduction through the best available technology.<sup>108</sup> If the EU would withdraw the measure, the condition would be an expeditious development and implementation of the Chapter 4 standard. The problems currently faced by U.S. carriers and manufacturers would simply be delayed since these aircraft will be obsolete within two or three years. James Erickson, director of the Office of Environment and Energy of the Federal Aviation Administration, pointed out that the Stage 4 noise standard will need to be implemented much quicker than the Stage 3, for which airlines were granted almost 10 years. The deadline could even be

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<sup>105</sup> See CAEP/3, *supra* note 67, at ¶ 1.5.6.

<sup>106</sup> For example, Article 11 of the Air Transport Agreement between the United States and Luxembourg, signed at Luxembourg Aug. 19, 1986, and entered into force Aug. 3, 1988. DOS: 88-252; TIAS: TIAS 11249.

<sup>107</sup> In particular, the U.S. set forth three progressive compliance levels for aircraft to meet by the end of 1994, 1996, and 1998 during the interim period. See 49 U.S.C. §47528 (1999), Prohibition on Operating Certain Aircraft not Complying with Stage 3 noise levels; 14 C.F.R. part 91, Subpart I, Operating Noise Limits, Sec. 91-865.

<sup>108</sup> See CAEP/3, *supra* note 67, at ¶ 1.5.6.

within five years, according to Erickson, which would force airlines to spend billions of dollars to upgrade their fleets.<sup>109</sup>

c. The Alleged Losses

The EU alleges that the United States is unable to provide sufficient evidence that the Regulation would cost two billion dollars to the U.S. aviation industry. First, U.S. carriers allegedly only operate a limited number of hushkitted aircraft between the United States and the EU.

Second, the Regulation has only a limited impact on the resale market of older aircraft because such aircraft are in any event at or close to the end of their economic life.

Third, the EU hushkit Regulation is only one of the reasons why airlines start to update their fleets. The replacement of older Chapter 2 aircraft by Chapter 3 aircraft is also economically advantageous to airlines. Many airlines start replacing Chapter 2 aircraft because of the benefits gained from higher daily utilization rates and lower maintenance and direct operating costs of first-time certificated Chapter 3 aircraft.<sup>110</sup> Another factor pushing airlines to replace older aircraft are stringent and costly regulations. Many airlines seem concerned with recent and pending Federal Aviation Administration regulations mandating more careful inspections of components, wiring, and fuel systems of older aircraft that would further increase maintenance costs.<sup>111</sup>

d. The Noise Issue

The EU adduces significant evidence<sup>112</sup> to prove that the noise emission levels as well as the gaseous emissions performances and fuel consumption of recertificated aircraft are significantly worse than that of current technology aircraft originally

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<sup>109</sup> Indeed, the proposals being discussed by the ICAO working parties range from no action at all to a ban on Chapter 3 compliant aircraft as early as 2011. See *Chapter 4 Noise Proposals Start to Enter Residual Value Calculations*, AIRCRAFT VALUE NEWS, Dec. 6, 1999.

<sup>110</sup> Hawaiian Airlines management decided to replace its existing DC-9 fleet with 13 Boeing 717s because the higher daily utilization, lower maintenance, and direct operating costs are expected to save it \$200 million over 10 years. These prospects of lower maintenance and direct operating costs encouraged TWA, Delta Air Lines, Air Tran, and American Airlines to make similar fleet replacement decisions. See Edward Tripp, *Capacity, Cost, Noise Issues Accelerate Fleet Replacements*, AERO SAFETY & MAINTENANCE, Oct. 29, 1999, at 4.

<sup>111</sup> See *id.* at 4.

<sup>112</sup> See *infra* Part III.A.

certificated to meet the Chapter 3 standard. Accordingly, in order to prevent a further deterioration of the noise situation, environmental groups have lobbied hard for the adoption of this Regulation.

In addition, the EU maintains that the goal of this Regulation is to preserve the opportunities for further growth in air traffic in Europe to the benefit of all carriers, including U.S. carriers.<sup>113</sup>

e. Performance Versus Design Standard

The EU asserts that the use of a design standard is not explicitly prohibited by the Agreement on Technical Barriers to Trade (see below).

B. THE PARTIES' POSITIONS VIEWED IN THE LIGHT OF  
SCIENTIFIC EVIDENCE

Recertificated ex-Chapter 2 aircraft undeniably incorporate older and often outdated technology. Some of the designs date back to the 1960s. In order to meet the Chapter 3 standard, these aircraft are modified through technical measures, such as hushkits, engine modifications or replacements, or through operational restrictions such as weight restrictions and reduced flap settings. Even if these measures reduce the noise pollution to some extent, recertificated aircraft still have a worse noise performance, weight for weight, than first-time certificated Chapter 3 aircraft. Studies carried out on both sides of the Atlantic as well as local measures taken by airports in the EU and in the United States clearly support this.

1. *Study on the Assessment of the Environmental Impact of Recertificated Chapter 3 Aircraft Versus "First-time" Certificated Chapter 3 Aircraft*<sup>114</sup>

An independent study carried out at the request of the European Commission concludes that aircraft designed from the outset to satisfy Chapter 3 are superior in all environmental respects to recertificated aircraft, except where an aircraft is totally reengined with a modern high bypass ratio turbofan. In addition, noise certification results suggest that the dividing line

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<sup>113</sup> See *Information Pack*, *supra* note 71.

<sup>114</sup> This chapter is entirely based on a study, carried out by M.J.T. Smith for the European Commission. See Smith, *supra* note 43.

between “noisy” low bypass and “quiet” high bypass engines is situated close to a bypass ratio of 3.

This study asserts that the recertification process of original Chapter 2 aircraft necessitates limits on the maximum takeoff weight and/or changes to operational procedures as well as engineering modifications in order to satisfy the Chapter 3 standard. These changes made to recertificated or hushkitted aircraft, including partial or complete engine replacement with low bypass ratio jet engines, do not reduce noise sufficiently to produce aircraft that complies with the certification standards with the same margins as aircraft originally certificated to Chapter 3. Accordingly, these ex-Chapter 2 aircraft are not nearly as quiet as the more modern aircraft in everyday operation.

While the claims of proponents of recertification through hushkitting or reengining may well be valid, they ignore the vital underlying issue that if the older aircraft were retired early in 2002, as intended, they would be replaced by modern counterparts that are better with respect to noise, fuel efficiency, and exhaust emissions than the designs that date back to the 1960s. Modern turbofan-powered aircraft of equivalent size as the older low bypass aircraft they replace generate a minimum of 5 EPNdB average improvement over hushkitted types. A 5dB reduction in noise reduces the takeoff noise footprint area by more than 50%. Modern counterparts often achieve a further 5dB noise reduction, which would equate to a reduction in the basic noise contour area (zone around airport affected by aircraft noise) by around 80%. These modern aircraft also have a much better fuel efficiency rate and produce less exhaust gas emissions than the older aircraft.

#### a. Noise Certification

Although the purpose of noise certification is to ensure that the latest available noise reduction technology is incorporated into the aircraft design, the Chapter 3 noise standard was introduced 20 years ago, before the main benefits of such technology had been incorporated into the aircraft product. In addition, during these past 20 years, the Chapter 3 standard has not been adapted to reflect the new improvements in engine noise control and in other general engine and airframe technologies.

The current “state of the art” aircraft, in which the latest technology has been built-in, often have substantial margins with respect to the Chapter 3 standard while hushkitted aircraft have not. The increase in the stringency of the noise standard is



therefore a high priority on the agenda of CAEP/5 in 2001. The CAEP will have to address the issue of how the Chapter 3 framework can be made more representative of modern operating conditions and present-day noise disturbance around airports. The distances of the basic three reference points (Lateral, Flyover, and Approach)<sup>115</sup> were adjusted in the 1960s to permit aircraft to reach the same maximum 108EPNdB at each point. Therefore, compliance with Chapter 3 is not necessarily a true indication of how quiet an aircraft appears to residents living around airports.

Many hushkitted aircraft are "shoehorned" into compliance with Chapter 3 by taking advantage of the "trade-off" allowance between the three reference points of the noise certification process. Within the individual limit of 2 EPNdB, an excess at one or two of the reference points can be compensated by a compliance margin at the other reference point(s) but no more than 3 EPNdB may be traded this way. Most high bypass (or "turbofan") engined Chapter 3 aircraft do not have to use this tradeoff because of their substantial compliance margins against the standard.

Table 1 expresses the minimum and maximum margins of compliance of hushkitted aircraft at each of the three reference points individually, highlights any excesses, and provides the cumulative values contained in the range of recertificated maximum takeoff weights. Table 2 summarizes the margins achieved by Chapter 3 aircraft of similar weights as the hushkitted types.

It is clear from Table 1 that most hushkitted aircraft only barely meet Chapter 3 and only if they rely on the "tradeoff" allowance. Table 2, on the other hand, shows that aircraft equipped with modern turbofan engines do not need to rely on the tradeoff allowance to satisfy the standard, and even frequently show large margins.

The 2000 product line, presented by manufacturers at the ICAO CAEP/3 in December 1995, indicated average margins at very high aircraft weights of some 5EPNdB at the three reference points. The margins for the lightest certificated weights were almost 10EPNdB, which leads to a halving of noise per-

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<sup>115</sup> For a discussion of the three noise measurement points and the certification process, see Rolf, *supra* note 65, at 393-99. Note that the Lateral Noise Measurement Point is also known as the Sideline Noise Measurement Point and the Flyover Noise Measurement Point as the Takeoff Noise Measurement Point.

Table 1. Noise Margins (EPNdB) of Recertificated Aircraft against Chapter 3

Aircraft and Engine Type	Hushkit	Takeoff Weight Range Tonnes	Min/Max Chapter 3 Compliance Margins			
			Lateral	Flyover	Approach	Cumulative*
B727-100	Fedex	72.5 – 76.8	-0.4	0.3	1.8	2.2
JT8D-15			0.4	1.9	2.7	4.6
B727-200			-0.9	-1.9	0.4	0.1
JT8D-7/9	Fedex	76.8 – 80.5	0.5	0.6	1.7	1.4
B727-200			-2.0	-1.3	2.7	0.0
JT8D-15			-1.8	-0.4	3.3	1.0
B727-200RE	Valsan	86.4 – 92.1	-2.0	1.2	2.0	1.9
JT8D-15/217C			0.0	3.9	2.4	4.2
B737-200/A			1.8	-2.0	3.1	0.2
JT8D-9/15	Nordam	53.3 – 53.8	-0.1	-1.2	3.2	1.1
B-737-200			-1.2	2.8	-0.1	0.0
JT8D-15/A			-1.4	5.4	0.4	3.9
B737-200Adv	Nordam	44.5 – 57.7	-1.8	-2.0	0.5	0.0
JT8D-15/A			1.3	4.4	3.1	3.9
DC9-10/30			-1.8	-1.4	2.9	0.0
JT8D-7/A/B/-9	ABS	41.1 – 46.7	1.6	0.9	3.5	2.7
DC8-62	BAC	152.0 – 160.1	-1.8	0.1	0.1	0.3
JT3D-3B/7			-1.6	2.0	2.9	1.7

\* The cumulative values are the minimum and maximum margins of *one* of the recertificated weights in the total range and do not necessarily correspond to the sum of individual minimum and maximum values shown separately above for the three Reference conditions (Lateral, Flyover and Approach).

Source: Smith, *supra* note 43, at 16-17.

ceived by the human being. Compared with the best margins achieved by hushkitted aircraft, the differences are striking.

Despite the fact that the three reference points are based on the main areas of noise impact around airports, it should be remembered that Annex 16 is a basic standard, reflecting neither the relative annoyance caused by different types of aircraft nor the different operating procedures used by the airlines.

One significant difference between the certification procedure and the noise intrusion around airports is that Annex 16 allows the amount of noise from individual aircraft to increase with higher weight whereas human annoyance increases with a higher noise level, not aircraft size. For example, Chapter 3 allows the noise on Flyover to increase by some 17EPNdB from the lowest to the highest aircraft weight. This means almost a four-fold increase in relative loudness or annoyance. Combined with the 9EPNdB increase allowed at the lateral point, which defines the "width" of the takeoff noise contour, this equals a four-fold increase in noise footprint area.

Table 2. Maximum and Minimum Noise Margins (EPNdB) of Chapter 3 Types encompassing Weight Range of Recertificated Types

Aircraft and Engine Type	Max. Takeoff Weight Range Tonnes	Min/Max Chapter 3 Compliance Margins				
		Lateral	Flyover	Approach	Cumulative*	
					Min/Max	Avg
BAe146	37.3-46.0	4.2	6.6	0.3		15.6
ALF500		7.7	10.9	3.2	20.2	
F100	47.1-49.9	4.1	2.7	5.4	13.4	13.9
Tay		6.2	3.7	6.6	14.3	
MD80/83/87	56.7-74.4	-0.9	-1.0	6.7	6.5	9.2
JT8D-200		2.0	5.9	7.3	11.9	
MD90	65.9-75.4	5.9	9.0	8.7	23.6	24.6
V2500		7.3	10.1	8.3	25.7	
B737-3/4/500	60.2-76.8	3.4	1.8	-0.2	2.2	6.0
CFM56		7.1	4.9	0.0	9.7	
A319/20/21	58.0-78.0	1.7	1.7	4.4	8.8	13.0
CFM56		4.1	5.9	6.2	17.3	
B737-6/7/800	52.6-79.0	1.7	4.1	3.6	10.8	14.7
CFM56		6.7	9.1	4.8	18.7	
B757-200	99.8-115.9	3.5	7.3	6.5	12.2	17.1
RB211-535E4		5.4	11.9	6.8	22.1	
B767-200/ER	127.0-181.4	3.8	3.3	6.7	17.9	19.9
CF6-80C		6.3	11.3	7.4	21.9	

\* The cumulative values are the minimum and maximum margins of *one* of the recertificated weights in the total range and do not necessarily correspond to the sum of individual minimum and maximum values shown separately above for the three Reference conditions (Lateral, Flyover and Approach).

Source: Smith, *supra* note 43, at 17-18.

The departure noise usually has been the major source of complaints around airports. In the certification context, departure noise is reflected by the combination of the Lateral and Flyover conditions, which define the length and width of the noise footprint. Table 3 ranks hushkitted and Chapter 3 aircraft of the same broad weight range according to their compliance margins. According to this table, there is a clear dividing line between the "worst" Chapter 3 aircraft fitted with high bypass engines and the "best" of the hushkitted types at Lateral and Flyover. More than half the hushkitted aircraft exceed the cumulative Lateral and Flyover limits and even the "best" hushkitted type only achieve a 2.5 dB cumulative margin. The MD80, however, with its low bypass engines, falls amongst the hushkitted types.

In addition, the conditions of everyday operations are very different from the conditions during the certification process. Indeed, most daily operations are at less than maximum certificated takeoff weight and utilize reduced takeoff thrust

Table 3. Chapter 3 Departure Noise Margins (EPNdB) – All Types

Aircraft Type	Takeoff Weight Range Tonnes	Hushkit	Cumulative Chapter 3 (Lateral + Flyover) Departure Compliance Margin	
			Min-Max	Average
MD90	66 – 75	None	15.8 – 16.3	16.0
BAe146	37 – 46	None	10.8 – 17.6	14.2
B767-200/ER	159 – 181	None	10.8 – 15.1	12.9
B757-200	100 – 116	None	11.2 – 13.8	12.5
DC8-71/2/3	149 – 161	Reengined	12.1 – 12.5	12.3
B737-6/7/8	53 – 79	None	7.7 – 13.1	10.4
B737-3/4/5	60 – 76	None	7.3 – 12.4	9.8
F100	47 – 49	None	7.8 – 9.9	8.8
B727-Tay	77	Reengined	7.2	7.2
A319/20/21	58 – 78	None	4.4 – 10.0	7.2
B737-200	47 – 54	Nordam	1.0 – 4.0	2.5
MD80/83/87	64 – 74	None	-0.2 – 5.2	2.5
B727-200RE	86 – 92	Valsan	-0.8 – 3.9	1.6
B727-100	72 – 76	Fedex	-0.1 – 2.3	1.1
B737-200Adv	44 – 57	Nordam	-3.8 – 5.7	1.0
DC8-62	152 – 160	BAC/ MGM	-1.7 – 0.4	-0.6
B727-200	77 – 81	Fedex	-2.8 – 1.1	-0.8
DC9-10/30	41 – 46	ABS	-3.2 – -0.7	-1.9
B737-200/A	53 – 53	AvAero	-3.0 – -2.1	-2.5
B727-200	70 – 87	Fedex	-3.3 – -2.2	-2.7

Source: Smith, *supra* note 43, at 18-19.

(the so-called “de-rating”) during initial climb to 1000 to 1500ft. This generates less noise than in certification compliance-demonstration. Recertificated aircraft already have to limit maximum takeoff weight in the certification process to achieve Chapter 3 compliance and accordingly cannot take full benefit from this de-rating in operation.

After the initial climb phase, power “cutback” is normally initiated to normal climb power rating to conserve engine life. To demonstrate minimum noise possible on flyover, a very high degree of cutback is permitted. Because the jet noise of low bypass hushkitted aircraft is so much louder, the value of cutback is considerably more than with a turbofan. Since this cutback is rarely used in everyday operations, recertificated aircraft lose the large noise benefit available from this procedure. In the context of noise impact on the community, the realities of operational practices widen the gap between Chapter 3 and recertificated types even further.

### b. The Legitimacy of a Bypass Ratio of Three

Modern high turbofans incorporate the results of 30 years of noise research. Some of these newly discovered technologies can be applied to older engine types, particularly to sources generated within the engine. But the need for a low jet exhaust velocity makes a significant lowering of the overall noise of low bypass jets almost impossible.

Engines with a BPR of 0 to 1 could not satisfy the original Chapter 2 standards (without hushkitting), nor could those with a BPR below 2 satisfy the Chapter 3 standard.<sup>116</sup> The latter included the Boeing 727s, the early Boeing 737s, the DC9s, the F28, and the BAC1-11. Airplanes that satisfy Chapter 3 from the outset have BPRs ranging from 4 to 6, while the latest engines are closer to 10. At full power, this means that the jet noise improvement over earlier types of engines has been around 15 to 20 dB, even with increased engine size.

According to the study, the point on the bypass ratio where noticeable improvements become apparent is a minimum of two and probably closer to three. In order to decide whether the dividing line between "quiet" and noisy" aircraft lies at a BPR of 2 or 3, aircraft with the JT8D-200 series are compared with aircraft equipped with a Rolls Royce Tay engine. The only two commercial aircraft originally installed with these engines are the MD80 series developed from the DC9 and the F100 developed from the F28. It should be remembered that the MD80 is considerably heavier than the F100 and permitted to make more noise under Chapter 3.

Table 4. Noise margins (EPNdB) of F100 against MD80 series

Aircraft	Maximum Takeoff Weight Tonnes	Chapter 3 Compliance Margins				
		Lateral (L)	Flyover (F)	Approach (A)	Cumulative L + F + A      L + F	
F100	49.9	4.1	3.7	5.6	13.4	7.8
MD80	74.4	0.7	-1.0	6.8	6.5	-0.3
MD83	73.5	-0.3	0.1	6.8	6.5	-0.2
MD87	67.8	-0.6	2.5	6.9	8.8	1.9

Source: Smith, *supra* note 43, at 12.

When looking at the key combined departure noise indicators of Lateral and Flyover, the differences are striking. To comply

<sup>116</sup> For a discussion of the Chapter 2 and Chapter 3 standard, see *supra*, Part I.C.1.

with Chapter 3, the MD80 series rely on a margin at Approach to offset excesses at one of the two critical departure conditions. On departure, the MD80 and the MD83 exceed the cumulative limits. The lighter MD87 has less than a two-decibel margin while the F100 has almost eight.

This comparison and the examination of the noise data for Chapter 3 in Tables 2 and 3 (see above), where the "departure" cumulative margins are between 8 and 16EPNdB, lead to the conclusion that the dividing line between acceptable and unacceptable from the community standpoint is nearer the 8dB margin of the F100 than the near-zero margin of the MD80 series. This in turn puts the dividing line closer to BPR of 3 than 2.

This conclusion is also supported when examining the only two complete reengining projects that resulted from noise constraints. The first reengining project replaced the JT3D engines in the DC8-70 series with CFM56s. The second was the Alenia reengining of the UPS B727-100 with Tay engines. Their performance against the Chapter 3 standard is summarized below.

Table 5. Noise margins (EPNdB) for DC8-70 series and B727-100UPS, reengined with turbofans

Aircraft	Maximum Takeoff Weight Tonnes	Chapter 3 Compliance Margins				
		Lateral (L)	Flyover (F)	Approach (A)	Cumulative	
					L + F + A	L + F
DC8-71	149	6.5	6.0	4.3	16.8	12.5
DC8-72	159	6.8	5.7	4.9	17.4	12.5
DC8-73	161	6.8	5.3	4.8	16.9	12.1
B727-100 UPS	77	4.6	2.6	5.4	12.6	7.2

Source: *supra* note 43, at 13.

The improved noise performance of aircraft reengined with the above-mentioned turbofans is clear, especially when compared with the hushkitted aircraft listed in Table 1. In addition, Table 3 provides an across-the-board comparison of all the relevant aircraft, in particular Chapter 3 aircraft, partially and fully reengined aircraft and hushkitted aircraft. The dashed line indicates the boundary between aircraft with engines of less than BPR of 2 and greater than 3.

### c. Fuel Consumption and Exhaust Emissions

Although hushkits incorporating new engines or improved performance features may well improve fuel consumption, the real comparison should be made with modern aircraft that

would have replaced the Chapter 2 aircraft had they been retired by 2000 in the U.S. and by April 1, 2002, in the EU. Accordingly, arguments claiming that retaining or marginally improving fuel consumption of older aircraft ignore the fact that each newly developed aircraft design is fundamentally better than its predecessor.

The same rationale extends into the issue of engine exhaust emissions. The most important products of combustion that have an impact on the environment are oxides of nitrogen (NO<sub>x</sub>) and carbon dioxide (CO<sub>2</sub>), while others receiving attention are carbon monoxide (CO), water (H<sub>2</sub>O), unburned hydrocarbons (UHC), and visible carbon particles (smoke).

With respect to the emission of NO<sub>x</sub>, modern engines of the same size category as those used on hushkitted aircraft are much more advanced in NO<sub>x</sub> control than the earlier designs. For example, the JT8D-200 series, used as a replacement for earlier JT8D engines in some of the recertificated aircraft, produces 50% or more NO<sub>x</sub> than engines like the CFM56 in Boeing and Airbus aircraft and the BR700 series destined for the latest DC9/MD80 variant, the B717. These modern engines comply with the latest Annex 16 proposals of CAEP/4 whereas the older types only satisfy the 1985 standards. With regard to other engine exhaust emissions, the situation is similar.

These results again have been confirmed by an article published in the ICAO Journal of July/August 1998. According to this article, modern aircraft have significantly lower emissions than older aircraft. Emissions from such modern aircraft can contain up to 50 percent less carbon dioxide, 70 percent less carbon monoxide, and 90 percent fewer unburned hydrocarbons.<sup>117</sup> The article supports this conclusion with data provided by Lufthansa, which compares the level of emissions by aircraft type and engines.

#### d. Conclusion

The above-mentioned results clearly show that the full benefits resulting from the progressive phase-out of Chapter 2 aircraft over the past two decades will be jeopardized by any extension of the operational lives of low bypass aircraft via hushkitting and recertification.

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<sup>117</sup> See Jane Hupe, *CAEP/4 May Be a Turning Point in ICAO's Work in Environmental Protection*, 53 ICAO JOURNAL, July/Aug. 1998, at 7.

## 2. *A Review of the Raisbeck Modification*<sup>118</sup>

Airports Council International North America (“ACI-North America”) conducted a study on the Raisbeck Engineering Stage 3 modification kit for Boeing 727-200 aircraft equipped with the JT8D-15 engine. The study compares the noise improvements of the Raisbeck modification with an original Chapter 2 Boeing 727 and with a Fedex Hushkit 727. It references little to the original Stage 3 certificated Boeing 757.

The Raisbeck modification achieves a 12% thrust reduction from the takeoff thrust level of the JT8D-15 engine by reducing the gross weight and modifying the flap settings. On a Boeing 727-200 with JT8D-15 engines, a 12% thrust decrease equals a reduction of about 1600 pounds of takeoff thrust, which in turn correlates to a noise reduction of about 3 to 4 dB.<sup>119</sup> “By using the approach noise trade-off allowed under FAR Part 36, these modifications allow the aircraft . . . to meet the Stage 3 limits.”<sup>120</sup> FAR Part 36 certification limits aircraft takeoff, landing, and sideline noise at three specific monitoring locations—one for each measurement. For takeoff, this point is 3.5 nautical miles from break release.

One study compares the Raisbeck modified aircraft to the standard Boeing 727-200 with JT8D-15 engines at a comparable takeoff weight.<sup>121</sup>

Although the Raisbeck aircraft is somewhat quieter than the unmodified Boeing 727 on the runway sideline and on takeoff, the noise improvement is only noticed close to the runway. At greater distances, the Raisbeck aircraft is similar to the unmodified aircraft. Although the 727-200 equipped with the FedEx hushkit is distinctively quieter on takeoff, it still does not compare with the noise footprint of the Boeing 757.<sup>122</sup>

The study concludes that, although the Raisbeck Stage 3 kit is a cost-effective solution to achieve Stage 3 compliance under FAR 36, the real benefits to the Community remain limited. The Raisbeck modification does not provide significant noise reductions beyond the extent of the measurement points specified

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<sup>118</sup> This chapter is based on a study by ACI-North America, in which the benefits of the Raisbeck modification were examined. See, ACI-North America, *A Review of the Community Noise Impact of the Raisbeck Boeing 727-200 (IGW) Stage 3 Kit*, Mar. 15, 1999.

<sup>119</sup> See *id.*

<sup>120</sup> *Id.*

<sup>121</sup> See *infra* Annex A.

<sup>122</sup> See *id.*



in FAR Part 36, and probably only has a discernable effect on communities within one mile of the end of the runway protection zone.<sup>123</sup>

### III. NOISE POLLUTION AROUND EU AND U.S. AIRPORTS

#### A. THE CASES OF SALZBURG AIRPORT AND AMSTERDAM AIRPORT SCHIPHOL

The future growth of civil aviation in Europe depends upon the ability of the aviation industry to reduce the current aircraft noise levels. The provision of sufficient capacity at European airports is of equal importance to U.S. as to European carriers. Hushkitted Chapter 2 aircraft have a significantly worse noise performance than the new improved aircraft certificated to Chapter 3 standards. According to ACI-Europe,<sup>124</sup> a 12% increase in the number of hushkitted aircraft equals a 50% increase in noise contour therefore disproportionately increasing the cumulative noise load around airports. The case of Salzburg Airport and Amsterdam Airport Schiphol clearly illustrate this.

##### 1. *Salzburg Airport*

Salzburg Airport, a typical regional European airport, allowed only aircraft meeting Chapter 3 as early as 1991. The City of Salzburg's Environmental Department conducted a study based on noise data from the airport's monitoring system.<sup>125</sup> This study showed that between 1988 and 1995 the noise level around the airport decreased from 66dB to 59dB despite an increase in aircraft movements from 11,002 to 23,563.<sup>126</sup> Despite a 114% increase in air movements since 1988, annual noise levels have decreased by 80%.<sup>127</sup>

Another study conducted at the airport revealed that 356 takeoffs of hushkitted aircraft (one daily departure) produced the same noise levels as the current 25,000 commercial move-

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<sup>123</sup> See *id.*

<sup>124</sup> ACI Europe represents the interests of over 210 airport operators with some 450 airports in 48 countries stretching from Portugal to the far east of Russia accounting for over 90% of commercial air traffic in Europe. See members link at <<http://www.aci-europe.org>>.

<sup>125</sup> See ACI Europe, *Airports Support Ban on Hush-Kitted Aircraft*, (visited Jan. 29, 2000) <<http://www.aci-europe.org/Public/Pressoffice/html/Releases/0060.htm>>.

<sup>126</sup> See *id.*

<sup>127</sup> See *id.*

ments. That means that one hushkit equals sixty-eight normal Chapter 3 movements.<sup>128</sup>

The Salzburg's Environmental Department also compared aircraft types by the noise energy they emit, based on the airport's noise monitoring system. Taking the noisiest Chapter 3 aircraft operating in Salzburg (the MD80), two Airbus A310s, five Boeing 757s, ten Fokker 100s, forty Dash 8s, or fifty Canadian Regional Jets can take off instead of one MD80.<sup>129</sup> This means that Salzburg Airport could triple its movements with low-noise aircraft without increasing the noise impact.<sup>130</sup> Hushkitted aircraft generate noise levels for exceeding noise levels of Chapter 3 aircraft. One hushkitted Boeing 727 creates the same noise energy as three Boeing 767s or eight A320s or twenty Fokker 70s or forty Canadian Regional Jets.<sup>131</sup> In addition, the hushkitted aircraft's sound characteristics and its weak climb performance cause complaints from areas of up to 10 km, where the airport normally receives no negative reactions.<sup>132</sup> The fact that hushkitted aircraft fly about 1000 feet lower on their departure route than normal Chapter 3 aircraft forms one of the reasons for these complaints.<sup>133</sup>

## 2. *Amsterdam Airport Schiphol*<sup>134</sup>

In the Netherlands, the level of noise caused by aircraft is measured in Kosten units (Ke).<sup>135</sup> These can be plotted on a map and joined up to produce noise contours showing areas that receive the same amount of noise. The effective capacity of Amsterdam's Airport Schiphol ("Schiphol") is restricted by two legal noise zones, which cannot be exceeded at any point or in any year.<sup>136</sup> The most restrictive in the sense of annual capacity is the present 35 Ke noise zone that restricts the overall noise impact by flying aircraft during a twelve-month period. Because noise nuisance is confined to the area within the 35 Ke contour, an indemnity zone is established outside the 35 Ke contour,

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<sup>128</sup> See *id.*

<sup>129</sup> See *id.*

<sup>130</sup> See *id.*

<sup>131</sup> See *id.*

<sup>132</sup> See *id.*

<sup>133</sup> See *id.*

<sup>134</sup> See Eric de Boer, *Relative Noise Capacity Consumption of Hushkitted Aircraft at Schiphol Airport*, Oct. 3, 1999.

<sup>135</sup> Kosten Noise Capacity: named after Dutch Professor Kosten who developed formulas to calculate aircraft noise.

<sup>136</sup> See de Boer, *supra* note 134.

bounded by the 30 Ke contour (roughly comparable with LAeq 134=55 dB). Within this area, the construction of new housing is prohibited.<sup>137</sup> Because this noise limitation system is very hard to comply with in practice, it inhibits all further growth in the number of aircraft movements, unless it is compensated by a reduction in average noise level per aircraft movement.

To comply with these noise limitations, Schiphol actively encouraged carriers to replace the noisiest Chapter 2 aircraft with quieter aircraft. In March 1999, Chapter 2 flights only accounted for less than 1% of all commercial flights. To accommodate further air traffic growth, however, Schiphol continues to discourage the use of noisy aircraft and tries to stimulate the use of modern Chapter 3 aircraft. The proliferation of hushkitted aircraft would undermine this policy because it would effectively reduce Schiphol's annual capacity. In order to prove their claim, Schiphol airport calculated the "noise capacity exchange rate" between some hushkitted ex-Chapter 2 aircraft and some equivalent modern first-time certificated Chapter 3 aircraft.

Table 6. Noise capacity exchange rate for Recertificated aircraft against Chapter 3 aircraft

Hushkitted type	DC9-30	B727-200	B737-200
Average cumulative margin over 3 measurement points (EPNdB)	0.2	0.97	1.62
Equivalent modern quiet type	F100	A321	B737-500
Average cumulative margin over 3 measurement points (EPNdB)	13.9	13.3	9.45
Exchange ratio – in Kosten noise rating	2.0	1.9	1.5
Exchange ratio – in LAeq rating system	2.9	2.6	1.8

Source: de Boer, *supra* note 134.

These tables mean that, in terms of "Kosten noise capacity," each flight with a hushkitted DC9-30 uses up as much available noise capacity as two flights with a comparable Chapter 3 air-

<sup>137</sup> See *id.*

craft like the F100. In terms of "LAeq noise capacity" the equivalent is nearly three (2.9) F100 flights.

The comparison was made with equivalent aircraft types that are now in widespread use and that are not even the quietest in their class at the moment. The exchange ratios with the most modern "state of the art" aircraft types would even be higher.

#### B. NOISE PROBLEMS AT U.S. AIRPORTS

United States airports have recognized the urgent need for a complete phase-out of Chapter 2 aircraft, including hushkitted or otherwise recertificated types. David Z. Plavin, President of ACI-North America,<sup>138</sup> shares the EU's conviction that acoustically modified aircraft do not produce the large reductions in community noise levels as was expected and likely will anger residents living near airports once they realize that an all Stage 3 fleet will only marginally reduce the noise levels in their communities. Moreover, the community noise impacts probably will worsen as a result of the expected growth in air travel.<sup>139</sup> Therefore, he strongly supports developing a Stage 4 standard within CAEP/5.<sup>140</sup>

In addition, some U.S. airlines recognize the need to update their fleet with newer and less noisy aircraft. US Airways is expected to replace old Boeing 727s and McDonnell Douglas DC-9s with new Airbus A320s on its East Coast shuttle routes. According to US Airways, the new planes spread their noise over an area 10 times smaller than their old planes at airports in Boston and Washington.<sup>141</sup> And around New York's La Guardia, the noise "footprint" is seventeen times smaller.<sup>142</sup> According to Congressman Joe Crowley, who represents residents living near

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<sup>138</sup> Airports Council International-North America, which spans the United States and Canada, consists of almost 150 governing bodies owning and operating airports as well as 325 business providing services and products on which airports rely.

<sup>139</sup> According to Airport Traffic Figures of the Airports Council International, passenger traffic rose four percent, cargo traffic eight percent, and aircraft movements three percent between August 1998 and August 1999. Overall air transport figures for the first eight months of 1999 reflect continued, steady growth. See ACI, *Airport Traffic Figures Reflect Steady Growth*, (visited Jan. 28, 2000) <[http://www.airports.org/media/mr\\_19991217.html](http://www.airports.org/media/mr_19991217.html)>.

<sup>140</sup> See *Hearing on European Union Ban on Aircraft 'Hush-Kits' Before the Subcomm. on Aviation of the House Comm. on Transp. & Infrastructure*, 1999 (Statement of David Z. Plavin, President of ACI-NA) WL 20011240 (1999).

<sup>141</sup> See *Planes Getting Quieter; Noise Standard in Effect Jan. 1*, CINCINNATI POST, Dec. 21, 1999, at 7A.

<sup>142</sup> See *id.*

La Guardia, the hush kits meet "the letter of the law in compliance, but it's not in the spirit of the law, which is to have these airplanes become more quiet."<sup>143</sup>

Residents around U.S. airports increasingly complain about aircraft noise affecting their residential neighborhoods. Examples of constant oppositions by residents against airport expansion plans can be found throughout the United States, in particular in St. Charles,<sup>144</sup> Miami,<sup>145</sup> New York, and San Francisco<sup>146</sup>.

Moreover, the City of Burbank reached an agreement with the Burbank-Glendale-Pasadena Airport Authority whereby the Airport Authority is allowed to expand the airport in exchange for a night closure of the building and the fulfillment of some other conditions.<sup>147</sup> The parties agreed to a "framework settlement" that, among other things, allows the airport to adopt noise standards that go beyond national minimum standards, including an eventual ban on aircraft that meet the Stage 3 noise requirements via hushkits or re-engining.<sup>148</sup> Los Angeles International (LAX) and Ontario International (ONT) airports also seem to recognize that Stage 2 aircraft have older engines that generate more noise and emit more air pollution.<sup>149</sup>

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<sup>143</sup> *Id.*

<sup>144</sup> St. Charles Citizens Against Aircraft Noise oppose the city of St. Louis' plans to expand the airport by adding a runway which will bring the airport closer to St. Charles and aircraft lower over the city's historic districts, homes, churches, and schools. They even initiated various lawsuits in state and federal courts. See John Sonderegger & Ralph Dummit, *St. Charles County Briefs*, ST. LOUIS POST-DISPATCH, Sept. 13, 1999, at 1.

<sup>145</sup> See Tyler Bridges, *Aircraft Noise Still A Problem: Neighbors Complain, But No Plans Approved*, MIAMI HERALD, Apr. 11, 1999, at 1.

<sup>146</sup> Angelica Pence, *More Houses Near SFO to Get Noise Insulation/Additional \$34 Million Approved for Upgrades*, SAN FRANCISCO CHRON., Feb. 25, 2000.

<sup>147</sup> See Kristin S. Krause, *Harder than It Sounds*, TRAFFIC WORLD, Aug. 9, 1999, at 34; James Baumgarner, *U.S. To Charge EC Over Noise Regulation*, AVIATION DAILY, Sept. 10, 1999, at 1.

<sup>148</sup> See *Burbank Strikes Accord With Airport For New Terminal*, WKLY. OF BUS. AVIATION, Aug. 16, 1999, at 76.

<sup>149</sup> See *Ban on Noisy Stage 2 Aircraft Goes Into Effect Jan. 1 at LAX and Ontario Airports*, BUS. WIRE, Dec. 30, 1999.

IV. COMPATIBILITY OF THE EU REGULATION WITH  
THE AGREEMENT ON TECHNICAL BARRIERS TO  
TRADE AND WITH THE GENERAL  
AGREEMENT ON TRADE  
IN SERVICES

A. AGREEMENT ON TECHNICAL BARRIERS TO TRADE  
(TBT AGREEMENT)<sup>150</sup>

Among various agreements attached to the Agreement Creating the World Trade Organization ("WTO Charter"), the Agreement on Technical Barriers to Trade ("TBT Agreement") exerts some legal discipline over domestic standards effecting international trade.<sup>151</sup>

1. *Article 2.1*

Article 2.1 of the TBT Agreement contains a Most-Favored-Nation and a National Treatment obligation. The Article specifically provides that: "Members shall ensure that in respect of technical regulations, products imported from the territory of any Member shall be accorded treatment no less favourable than that accorded to like products of national origin and to like products originating in any other country."<sup>152</sup>

This Article prohibits discrimination between like products on the basis of origin. For the purpose of this Article, aircraft registered in the EU and aircraft registered in third countries are undoubtedly "like" products.

The issue to be examined, accordingly, is whether the Regulation treats aircraft registered in a third country "less favorably" than similar EU registered aircraft. In that respect, it is useful to review the measures introduced by the Regulation.<sup>153</sup>

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<sup>150</sup> See Agreement on Technical Barriers to Trade, GATT Doc. MTN/IA II-AIA to (Dec. 15, 1993), in Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, *reprinted in* 33 I.L.M. 9 (1994) [hereinafter "TBT Agreement"].

<sup>151</sup> See Seung Wha Chang, *GATting a Green Trade Barrier-Eco-labeling and the WTO Agreement on Technical Barriers to Trade*, 31 J. WORLD TRADE 137, 139 (1997).

<sup>152</sup> TBT Agreement, Art. 2.1, *supra* note 150.

<sup>153</sup> The Regulation subjects aircraft registered in an EU Member State to the non-addition rule. This rule prohibits Member States from adding recertificated aircraft to their registers as of May 4, 2000. See Regulation, Art. 3.1, *supra* note 11, at 49. Nevertheless, an aircraft registered in any Member State before May 4, 2000, which has been registered in the Community ever since, will not be affected by the non-addition rule. See Regulation, Art. 3.2, *supra* note 11, at 49. Additionally, the Regulation introduces a non-operation rule, aimed both at EU and third country carriers. The non-operation rule prohibits recertificated aircraft from

The United States opposes the measure because it allows EU aircraft to be transferred from the register of one Member State to another after May 4, 2000, without losing its right to operate after 2002.<sup>154</sup> Unlike aircraft registered in the EU, a third country aircraft that is transferred to the registry of another country after May 4, 2000, is barred from operating in the Community after 2002.<sup>155</sup> Although this difference in treatment might initially seem discriminatory, it is not discriminatory considering the EU as a single aviation market. Even if national registers are maintained for practical and historical purposes, these different registers constitute de facto one Community register. Accordingly, transfers among national registers within the EU should not be regarded as transfers affecting the operating rights of the aircraft concerned.

In conclusion, this measure does not discriminate between aircraft registered in the Community and aircraft registered in third countries. Both types of registered aircraft receive equal treatment. The measure allows all aircraft, regardless of origin, to continue to operate after 2002 in the EU provided that they were operating into the EU before 2000 and that they have remained on the same register.<sup>156</sup>

The nature of a technical standard, such as the one the EU Regulation enacted, is that like all non-tariff barriers "their effects are neither immediately visible NOR MEASURABLE."<sup>157</sup> Although the EU did not propose or adopt the Regulation with the specific purpose of discriminating and/or creating an obstacle to trade, distortions of trade might nonetheless result from the fact that national standards and technical regulations are different.<sup>158</sup>

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operating in the territory of the Community as of April 1, 2002, unless they meet two conditions. These conditions require an airplane operator to prove (1) that the plane was on the register of that third country on May 4, 2000, and (2) that it operated in the Community between April 1, 1995, and May 4, 2000. See Regulation, Art. 3.3, *supra* note 11, at 49. To put EU aircraft at the same level as third country aircraft, Article 3.4 imposes the same non-operation obligation on EU aircraft.

<sup>154</sup> See H.R. 661, 106th Cong. (1999).

<sup>155</sup> See Statement of Council's Reasons, 1998 O.J. (C 404) 5, 5.

<sup>156</sup> See Regulation, Art. 3.3, *supra* note 11, at 49.

<sup>157</sup> Nusbaumer, *supra* note 101, at 545 (emphasis added).

<sup>158</sup> See J.H.J. Bourgeois, *The Tokyo Round Agreements on Technical Barriers and on Government Procurement in International and EEC Perspective*, 19 COMMON MKT. L. REV. 5, 7 (1982).

Therefore, the question remains, under the ambit of Article 2.2 of the TBT Agreement, whether this facially neutral measure creates an unnecessary obstacle to trade or constitutes a case of disguised discrimination.

## 2. Article 2.2

Article 2.2, a core provision of the TBT Agreement, states that:

Members shall ensure that technical regulations are not prepared, adopted or applied with a view or with the effect of creating unnecessary obstacles to international trade. For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfill a legitimate objective, taking account of the risks non-fulfillment would create. Such legitimate objectives are, inter alia, national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment. In assessing such risks, relevant elements of consideration are, inter alia, available scientific and technical information, related processing technology or intended end uses of products.<sup>159</sup>

To be compatible with the TBT Agreement and GATT, a technical regulation should not create an unnecessary obstacle to international trade.

The United States claims that the Regulation creates an obstacle to trade because it harms the U.S. aviation industry. The United States, however, has failed so far to provide sufficient evidence that demonstrates the claimed two billion dollar economic impact of the measure. Most hushkitted aircraft, such as Boeing 727s and DC9s, do not operate transatlantic routes.<sup>160</sup> If they do, these carriers are on the U.S. register before May 4, 2000, and are operating in the Community before that same date. Therefore, the measure will not affect them. The EU measure solely prevents the United States from adding more hushkitted aircraft on these routes.

In addition, the Regulation has only a limited impact on the resale market of older aircraft because these aircraft in any event at or close to the end of their economic life. The Regulation does not prevent U.S. carriers from reselling these aircraft to third countries. The measure merely prevents these third

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<sup>159</sup> TBT Agreement, Art. 2.2, *supra* note 150.

<sup>160</sup> See Alan Yonan, Jr. *U.S. to File Complaint Over EU's Airplane "Hush Kit" Ban*, DOW JONES NEWS SERV., Jan. 13, 2000.



countries from operating these older aircraft in the European Community. Since more than 85% of the U.S. fleet are short to medium haul aircraft, the majority of U.S. aircraft are not technically eligible to operate between places such as Southern Africa and Europe.<sup>161</sup>

In addition, the United States still needs to either establish protectionist intent or prove that the measure exceeds what is "necessary."

a. Protectionist Intent or Effect

To determine whether the Regulation has a protectionist intent or effect, the definition of the targeted aircraft needs to be examined.

"Recertificated aircraft" includes hushkitted aircraft and aircraft that have undergone operational restrictions (weight restrictions or reduced flap setting) to meet the Chapter 3 standard. It excludes reengined aircraft, except when the replacement engine has a bypass ratio lower than three.

The United States claims that the measure will detrimentally affect U.S. carriers because more U.S. carriers have aircraft that fall within the recertificated category than EU carriers. More U.S. carriers have invested in hushkit technology than their EU counterparts. In addition, U.S. engine manufacturers produce most engines installed in older aircraft having a bypass ratio of less than three.

The European Union, on the other hand, asserts that there is no protectionist intent behind the adoption of the measure. The EU's sole motivations are environmental and human health concerns.<sup>162</sup> The EU maintains that the methodology used to distinguish between aircraft covered by the Regulation is based on sound technical data, collected on the basis of an independent study. These data concerning the noise certification clearly demonstrate that the noise level of hushkitted aircraft or aircraft with low bypass ratio engines is, weight for weight, considerably more damaging to the environment than aircraft originally certificated to conform with Chapter 3.

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<sup>161</sup> See websites of several U.S. carriers (such as <<http://www.aa.com/>>, <<http://www.delta-air.com/>>, <<http://www.ual.com/>>, <<http://www.usair.com/>>) and aircraft manufacturers (such as <<http://www.boeing.com/commercial>> and <<http://www.airbus.com/>>).

<sup>162</sup> See *Information Pack*, *supra* note 71, at 5.

Moreover, the United States doubts the usefulness of a bypass ratio of three to distinguish between aircraft targeted by the Regulation. It alleges that the EU chose a bypass ratio of three only or primarily to exclude U.S. manufactured engines from the permitted reengining process. The United States claims that the European producers manufacture most high bypass engines, which may be used to reengine older aircraft. To answer these allegations, the EU uses scientific evidence to prove the usefulness of a bypass ratio of three in deciding which aircraft should be prevented from being registered and operated in the European Community.<sup>163</sup>

The bypass ratio of three is based on real performance only and focuses on aircraft having proportionally a significant detrimental effect on the noise level at EU airports. In addition, Federal Aviation Regulation FAR 36, as amended by Amendment 7 of 1977, also recognized the usefulness of a bypass ratio of three.<sup>164</sup>

The technical experts with the United States, however, contest the validity of the EU's evidence. First, they assert that the hushkitted aircraft are situated around the ICAO Chapter 3 noise limit because U.S. carriers decided to hushkit their older aircraft only to the extent necessary to conform to the Chapter 3 noise standards. Secondly, the findings that U.S. experts used in Annex B<sup>165</sup> suggest that many aircraft with a high bypass ratio suffer from a worse noise performance than some aircraft with lower bypass ratios.

These results are only superficially contradictory. The airplanes that the U.S. report used are all aircraft with a bypass ratio of more than three. The United States fails to mention that these aircraft still have a significantly better noise performance than hushkitted aircraft even if some of them do not have the best noise performance. Additionally, the issue here is not to determine the noisiness of these high bypass ratio aircraft but to see whether the criteria of a bypass ratio of 3 is justified. According to the data provided in Table 3, which is not contradictory to the data provided by the United States in Annex B, the use of a bypass ratio of three to distinguish aircraft seems fully justified. Therefore, one may reasonably conclude that the defi-

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<sup>163</sup> See *supra* Part II. B.1.b.

<sup>164</sup> See 14 C.F.R. § 36.7, amended by 42 FR 12371, Mar. 3, 1977.

<sup>165</sup> See *infra*, Annex B.

dition of recertificated aircraft is based on sound scientific and technical data and has no protectionist intent or effect.

b. Measure Should not Create an “Unnecessary” Obstacle to Trade and Should Not Be More Trade-Restrictive than Necessary to Fulfill a Legitimate Objective

As discussed above, Article 2.2 of the TBT Agreement includes the protection of the environment as a legitimate objective. Because excessive aircraft noise is recognized as a severe environmental problem, the avoidance of such further noise pollution should be considered as a legitimate environmental concern. The second issue then is whether the measure is more trade-restrictive than is necessary to fulfill the legitimate concern of environmental protection or, in other words, whether the EU could have adopted an alternative measure with less impact upon international air transport.

The European Union’s Regulation merely avoids future noise level increases at Community airports. Indeed, recertificated aircraft operating in the European Community before May 4, 2000, will still be allowed to serve the same Community airports after April 1, 2002. The measure merely prevents EU Member States from adding additional recertificated aircraft to its registers. Likewise, recertificated aircraft registered in third countries after May 4, 2000, will be denied access to the territory of the Community.<sup>166</sup>

By freezing the existing noise levels, the EU has chosen the least trade-restrictive measure in order to prevent further noise pollution and to enhance the protection of a legitimate environmental concern.

c. Risks

Article 2.2 of the TBT Agreement mandates that WTO members to take into account the risks of the non-fulfillment of a legitimate objective, including the protection of human health and of the environment.<sup>167</sup> It also enumerates the factors to assess these risks, including available scientific and technical information, related processing technology, and intended end-uses of products.

The EU’s reluctance to implement the measure could clearly entail serious risks not only to human health and the environ-

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<sup>166</sup> See Regulation, Art. 3.2, *supra* note 11, at. 49.

<sup>167</sup> See TBT Agreement, Art. 2.2, *supra* note 150.

ment, but also to the European aviation market as a single economic entity.

Noise from aircraft causes mental distress and affects human's tolerance levels.<sup>168</sup> As air traffic becomes denser and airport congestion steadily increases, the risk that noise disturbance by aircraft movements will cause more devastating consequences to human health and the environment is inevitable. In addition, if the EU failed to take the measure, airports would likely impose unilateral "curfews,"<sup>169</sup> threatening the integrity of the European single aviation market.

It is arguable that there would be no violation of ICAO standards were individual airports to implement rules that, for example, limited hushkitted aircraft to only day time hours or assessed fees on hushkitted aircraft much higher, perhaps even prohibitively higher, than on other aircraft. Were the U.S. to press its complaint, therefore, a successful outcome for the U.S. could well amount to a Pyrrhic victory, with the implementation of outright bans by individual airports throughout the EU. In addition, the U.S. has many airports<sup>170</sup>—indeed, the entire State of Hawaii<sup>171</sup>—that have adopted noise prohibition on aircraft that arguably run afoul of ICAO's minimum requirements. Can the U.S. argue that these individual U.S. airport prohibitions are legal but comparable prohibitions by European airports not?

#### d. Conclusion

The EU Regulation does not create an obstacle to trade for U.S. carriers. The evidence the U.S. government advanced to prove the alleged economic impact of more than two billion dollars on the U.S. aviation industry is not at all persuasive. No facts or data have been produced that would support any damages much less damages of \$2 billion. Nor has the United States

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<sup>168</sup> See Goh, *supra* note 63, at 280-81.

<sup>169</sup> See *supra* Part I.C.2.a. for examples of unilateral action taken by several governments throughout the EU.

<sup>170</sup> See *supra*, Part III.B.

<sup>171</sup> In 1990, the U.S. Congress adopted 49 U.S.C. § 47528, prohibiting all U.S. and foreign airlines from operating more Stage 2 aircraft into Hawaii than they operated into Hawaii on November 5, 1990. This law was used at least once to preclude a new foreign carrier from flying into Hawaii using Stage 2 aircraft. In 1996, Orient Avia, a designated carrier from Russia, obtained DOT authority to operate Vladivostok—Hawaii, but was precluded because of the Congressional prohibition. See DOT Grants Orient Avia's Bid for Russia-Hawaii service, AVIATION DAILY, May 17, 1996; see also Russia's Orient Avia Still Eyes U.S. Service, AVIATION DAILY, Apr. 24, 1997.

produced any evidence as to the alleged detrimental effect on U.S. carriers were the Regulation adopted. Moreover, the Regulation's alleged impact on the resale market of aging U.S. aircraft carriers is not certain considering that most of these aircraft are close to or at the end of their economic life.

Even if the Regulation creates an obstacle to trade, Article 2.2 requires that a measure must have either a protectionist intent or effect, or that it went beyond what is necessary. Given the impetus from environmental groups for the adoption of this Regulation and considering that the Regulation's coverage as well as the non-addition and non-operation rule are based on sound technical data, the EU Regulation does not reveal any protectionist intent or effect. In addition, the EU Regulation does not introduce a flat ban, but merely freezes the existing noise level around Community airports, thus opting for the least trade-restrictive measure.

### 3. Article 2.4

Article 2.4 of the TBT Agreement requires WTO members to base their regulations as much as possible on international standards. Article 2.4 specifically provides:

Where technical regulations are required and relevant international standards exist or their completion is imminent, Members shall use them, or the relevant parts of them, as a basis for their technical regulations except when such international standards or relevant parts would be an ineffective or inappropriate means for the fulfillment [sic] of the legitimate objectives pursued, for instance because of fundamental climatic or geographical factors or fundamental technological problems.<sup>172</sup>

#### a. The Role and Force of Standards

The Standards and Recommended Practices (SARPs) that ICAO develops in the operational or technical field are only recommendations. It has been argued that SARPs do not bind contracting Parties. In fact, parties can contradict SARPs when necessary.<sup>173</sup> The incorporation of ICAO standards in Community legislation enhances the effectiveness of these standards.<sup>174</sup>

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<sup>172</sup> TBT Agreement, Art. 2.4, *supra* note 150.

<sup>173</sup> See THOMAS BUERGENTHAL, LAW-MAKING IN THE INTERNATIONAL CIVIL AVIATION ORGANIZATION, 77-78 (1969).

<sup>174</sup> See Goh, *supra* note 63, at 285.

Moreover, ICAO standards are minimum standards. Contracting parties increasingly find them as insufficient to address the safety and well-being of other citizens.<sup>175</sup> Article 1.2 of Part II of Volume I of Annex 16 provides that the State of Registry shall grant or validate a noise certification if satisfactory evidence is provided that the aircraft complies with requirements that are at least equal to the standards contained in Annex 16. Accordingly, this language implicitly but clearly indicates the "minimal" nature of these standards and seems arguably to allow Contracting States to adopt more stringent standards.

Even if the United States complies with the minimum standards Annex 16 sets forth, the EU could nonetheless still unilaterally impose stricter standards if the health and well-being of European citizens required it to do so.

b. The Compatibility of the Regulation with International Standards

The EU Regulation is not contrary to the international standards set by the ICAO. The Regulation does not introduce a new noise standard nor modify the current Chapter 3 standard, since it is nothing more than an operational rule aimed at preventing noise pollution increase from recertificated aircraft at European airports. Chapter 3 does not cover operational noise limits around airports. On the contrary, it merely sets forth noise measurement standards for aircraft for which the application for a certificate of airworthiness for the prototype was accepted on or after October 6, 1977.<sup>176</sup> The Regulation limits operations in the European Community and prevents the addition of recertificated aircraft on European registers. Therefore, it does not affect the ICAO certification rules or the Chapter 3 standard.

Even if the Regulation is contrary to the existing Chapter 3 standard, the Regulation is nevertheless justified under Article 2.4 of the TBT Agreement. First, the language used in Article 2.4 clearly indicates that the drafters of this provision wanted to avoid a watertight obligation to use international standards.<sup>177</sup> The provision thus leaves some room for WTO members to adopt stricter standards.

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<sup>175</sup> See Mendes de Leon, *supra* note 83, at 131.

<sup>176</sup> See *id.*

<sup>177</sup> See Nusbaumer, *supra* note 101, at 545.

Second, because the ICAO adopted the Chapter 3 standard more than 20 years ago (1977), this standard no longer reflects recent developments in engine technology or the exponential increase in air traffic volume. The EU believes the Chapter 3 standard is "ineffective or inappropriate" to avoid further environmental degradation from increasing noise pollution from aircraft movements. The establishment of a stricter standard in the Regulation, by freezing the existing noise levels, is justified under Article 2.4 of the TBT Agreement.

As mentioned above, even if hushkits reduce some noise, hushkitted aircraft remain much noisier than aircraft equipped with new technology engines.<sup>178</sup> They also emit more pollutants than modern aircraft.<sup>179</sup>

The Regulation does not discriminate against foreign airlines or manufacturers<sup>180</sup> since EU airlines are equally prevented from using hushkitted aircraft and EU manufacturers of non-compliant engines are equally affected.<sup>181</sup> The hushkit rule affects not only U.S. aircraft, such as refitted MD-80s, DC-9s, and Boeing 727s, but also European aircraft, such as BAC-111s and Fokker F-28s.<sup>182</sup>

The complaints from residential neighborhoods surrounding the airports provided the impetus for environmental groups to encourage the EU to pass the measure, not the EU aviation industry.<sup>183</sup>

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<sup>178</sup> See Smith, *supra* note 43, at 4.

<sup>179</sup> See Hupe, *supra* note 117, at 7.

<sup>180</sup> See *supra* Part IV. A.1 & 2.

<sup>181</sup> For example, Omega Air, an Irish manufacturer of hushkits and re-engineing technology. At the end of December, the English High Court ruled against the EU's non-addition rule for hushkitted aircraft in favor of Omega Air. The Court ruled that the use of engine bypass ratios instead of noise footprints to bar aircraft was invalid. The court referred the case to the European Court of Justice, which is expected to rule on the validity of the engine bypass ratio standard. Omega Air is also contesting the validity of the use of bypass ratios directly before the Court of First Instance of the European Communities and is claiming damages. In addition, it has begun proceedings against the rule in the Irish High Court. See *English Court Rules Against European Union Ban, AIRPORTS*, Jan. 4, 2000.

<sup>182</sup> See Christopher Fotos, *Transatlantic Battle Looms Over Hushkits; Airports Back Need For New Controls, AIRPORTS*, Sept. 14, 1999, at 380.

<sup>183</sup> Examples include: protests against the noise levels at London-Stansted Airport and the divided opinions of the local community over the construction of a second run-way at UK's Manchester airport. See Goh, *supra* note 63, at 280.

#### 4. Article 2.8

The Regulation should especially be examined in light of Article 2.8 of the TBT Agreement which states that: "Wherever appropriate, Members shall specify technical regulations based on product requirements in terms of performance rather than design or descriptive characteristics."<sup>184</sup>

This Article contains mild language. The words "wherever appropriate" clearly leave some room for members to base their technical regulations on design characteristics. Accordingly, the EU does not deem itself to be violating this Article when it acknowledges that the Regulation is indeed based on design rather than on performance characteristics.

#### B. GENERAL AGREEMENT ON TRADE IN SERVICES (GATS)

One of the basic provisions in GATS is the most-favored-nation ("MFN") obligation of Article II. Contrary to the corresponding principle in GATT, however, GATS members may maintain a MFN-inconsistent measure provided they list such MFN exemptions upon entry into force of the GATS. The GATS Annex on Air Transport Services constitutes such an Article II exemption.<sup>185</sup>

The Annex on Air Transport Services covers all "measures affecting trade in air transport services, scheduled or non-scheduled, and ancillary services" (Section 1 of the Annex). Because existing obligations under bilateral or multilateral agreements are "grandfathered,"<sup>186</sup> the Annex does not achieve any significant liberalization of the many bilateral agreements.

Moreover, Section 2 of the Annex explicitly excludes traffic rights and ancillary services from the scope of the GATS (the so-called "hard rights"). GATS only applies to aircraft repair and

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<sup>184</sup> TBT Agreement, Art. 2.8, *supra* note 150.

<sup>185</sup> See Ernst-Ulrich Petersmann, *Liberalization of International Air Transport Services Through the GATS?*, in PERSPECTIVES OF AIR LAW, SPACE LAW, AND INTERNATIONAL BUSINESS LAW FOR THE NEXT CENTURY (1996).

<sup>186</sup> "Grandfather rights" or the "Existing legislation clause" is a concept introduced in the Protocol of Provisional Application of the General Agreement on Tariffs and Trade and enabled Contracting Parties to maintain existing legislation inconsistent with Part II (Articles 3 to 23) of GATT. Similarly, Section 1 of the Annex on Air Transport Services provides: "It is confirmed that any specific commitment made or obligation assumed under this Agreement shall not reduce or affect a Member's obligations under bilateral or multilateral agreements that are in effect at the entry into force of the Agreement Establishing the WTO." 33 I.L.M. 44 (1994).



maintenance services, the selling and marketing of air transport services, and computer reservation systems (the so-called "soft-rights").<sup>187</sup>

Since the EU Regulation does not deal with any of these three covered "soft ancillary services," GATS is not applicable to the measure.

## V. COMPATIBILITY WITH THE CHICAGO CONVENTION AND WITH BILATERAL AIR SERVICES AGREEMENTS CONCLUDED BETWEEN EU MEMBER STATES AND THE U.S.

### A. DIRECTIVE VERSUS REGULATION

The Council's decision to change the proposed directive into a regulation is fully justified. Contrary to the opinion of those who oppose the Regulation, this change was not made to enable Members States to escape their international obligations under the bilateral air services agreements with the United States.

In this regard, it is useful to note the differences between a regulation and a directive. According to Article 249 (ex Article 189) of the Treaty establishing the European Community, a regulation has general application, is binding in its entirety, and is directly applicable in all Member States. A directive, however, is binding, as to the result to be achieved, upon each Member State to which it is addressed, but leaves to the national authorities the choice of form and methods.<sup>188</sup>

Whether the measure takes the form of a regulation or a directive, in both cases Member States are bound by the substantive obligations of the measure. The difference between these two Community legislative acts lies herein: to effect the internal legal order of a Member State, a directive requires a positive act of implementation, the form of which is left to the individual Member State's discretion. A regulation, to the contrary, does not require an act of implementation but, once adopted, directly effects the internal legal order of a Member State.

This difference is exactly why the Council preferred a regulation. Indeed, the pressing noise problem around airports commanded a quick and uniform response. The long

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<sup>187</sup> Section 3 of the Annex on Air Transport Services, GATS, *supra* note 42.

<sup>188</sup> Article 249 (ex Article 189) of the Consolidated Version of the Treaty Establishing the European Community, 1997 (C 340) 173.

implementation process of a Directive would have caused not only considerable delay, but extensive disuniformity during the delay period.<sup>189</sup>

## B. COMPATIBILITY WITH CHICAGO CONVENTION

The Regulation should be examined under several Articles of the Chicago Convention. Article 15 is especially relevant since it introduces a non-discrimination principle with regard to access to airports, the use of air navigation facilities, and the charges related to both.<sup>190</sup> In essence, Article 15 provides that every airport in a contracting State that is open to public use by its national aircraft, should also be open under uniform conditions to the aircraft of all other contracting Parties.<sup>191</sup> Closely related to Article 15 is Article 44, which provides that the aims and objectives of ICAO are to ensure that the rights of contracting States are fully respected and that every contracting State has a fair opportunity to operate international airlines.<sup>192</sup>

The United States alleges that the Regulation makes these articles obsolete since it restricts the access of U.S. carriers to Community airports and, accordingly, U.S. carriers would no longer enjoy a fair opportunity to operate international airlines.

As already mentioned under the TBT Agreement, however, the Regulation applies equally to EU carriers as well as to U.S. carriers, regardless of the transfer rule.<sup>193</sup> Although this rule might seem facially discriminatory, it is nonetheless justified in light of the single European aviation market. Since different national registers constitute in fact one Community register, transfers between these registers should not affect the operating rights of Community aircraft. Because the United States allegedly only operates a small number of hushkitted aircraft on transatlantic routes, the majority of its carriers serving these transatlantic routes are complying with the Regulation. Accordingly, the Regulation does not discriminate between EU and U.S. air carriers in terms of access to Community airports or fair opportunities to operate their international airlines.

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<sup>189</sup> Interview with Laurent Muschel, Transport Directorate-General, in Brussels, Belgium (Mar. 30, 1999).

<sup>190</sup> See Chicago Convention, Art. 15, *supra* note 5.

<sup>191</sup> See *id.*

<sup>192</sup> See Chicago Convention, Art. 44, *supra* note 5.

<sup>193</sup> See *supra* Part IV.A.1.

In addition, the Chicago Convention "does not prohibit discrimination, but merely considers the avoidance of discrimination as a goal to be achieved."<sup>194</sup>

The United States also claims that the EU Regulation violates Article 33 of the Chicago Convention. Article 33 requires all EU Member States to recognize the airworthiness certificates of U.S. registered aircraft as valid, provided "that the requirements under which such certificates and licenses were issued or rendered valid are equal to or above the minimum standards which may be established from time to time pursuant to this Convention."<sup>195</sup>

However, the EU questions the validity of the U.S. certificates of airworthiness. In particular, the EU contests the methodology United States authorities use to recertify hushkitted aircraft. The noise tests the U.S. uses allegedly differ from those required by ICAO, although the EU fails to present sufficient evidence in this regard. In addition, the EU alleges that the United States allows hushkitted aircraft pass the certification test under conditions which airlines cannot meet or do not respect under daily normal circumstances.<sup>196</sup> The EU claims that the U.S. authorities use new operational restrictions, like takeoff weight restrictions and speed requirements, to ensure that the hushkitted aircraft meet the Chapter 3 noise standard. The introduction of such operational restrictions allegedly is contrary to the purpose of noise certification, which is "to ensure that the latest available technology is incorporated into the aircraft design."<sup>197</sup>

Article 37 of the Chicago Convention is also important, mandating that "[e]ach contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulations . . . in all matters in which such uniformity will facilitate and improve air navigation."<sup>198</sup> This provision is more of a guideline or recommendation than an obligation imposed upon contracting States. In addition, as explained above,<sup>199</sup> the Regu-

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<sup>194</sup> B.D.K. Henaku, *The ICAO CNS/ATM System: New King, New Law?*, 19 AIR & SPACE L. 146, 149 (1994). While the Regulation may have some adverse impacts on the resale value of certain aging aircraft built and rebuilt by U.S. manufacturers, it may be argued that the provisions of the Chicago Convention apply to air services, not to the resale value of aircraft.

<sup>195</sup> See Chicago Convention, Art. 33, *supra* note 5.

<sup>196</sup> See *supra* Part II.B.1.a.

<sup>197</sup> See *Foreword* to Volume I of Annex 16 to the Chicago Convention, *supra* note 5.

<sup>198</sup> Chicago Convention Art. 37, *supra* note 5.

<sup>199</sup> See *supra* Part IV.A.3.

lation is not contrary to the Chapter 3 noise standard of ICAO since it constitutes an operational rule, not covered by the ICAO certification rules.

Moreover, even if the Regulation is contrary to the ICAO standards, the advisory nature of Article 37 allows for some exceptions. This is especially true when an international standard, such as the Chapter 3 standard, has become an ineffective tool in avoiding further noise pollution.

### C. COMPATIBILITY WITH BILATERAL AGREEMENTS

All bilateral air service agreements between the United States and the EU Member States contain an obligation to give U.S. carriers a "fair and equal opportunity to compete in international air transportation." The U.S. government alleges that the Regulation deprives their carriers of this fair and equal opportunity to compete. Since this issue has already been addressed sufficiently, reference is made to the relevant chapters.<sup>200</sup>

Most of these bilateral air service agreements also contain the following important provision:

Neither party shall unilaterally limit the volume of traffic, frequency or regularity of service, or the aircraft type or types operated by the designated airlines of the other Party, except as may be required for customs, technical, operational or environmental reasons under uniform conditions consistent with Article 15 of the Convention.<sup>201</sup>

These agreements thus appear to allow a party to take unilateral action, provided that operational or environmental grounds justify the action and uniform conditions apply. Even if the Regulation clearly has a sound environmental justification (the avoidance of further noise pollution and the protection of human health) it nonetheless still needs to be determined whether such a measure is applied under uniform conditions consistent with the non-discrimination principle of Article 15 of the Chicago Convention.<sup>202</sup> Again, the EU Regulation does not discriminate between EU and U.S. carriers but applies uniform operating conditions to both.<sup>203</sup>

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<sup>200</sup> See *supra* Part V.B.

<sup>201</sup> See Article 11(3) of the U.S.-Luxembourg Air Transport Agreement, *supra* note 106.

<sup>202</sup> See Chicago Convention, Art. 15, *supra* note 5.

<sup>203</sup> See *supra* Part IV.A.1 and Part V.B.

Accordingly, the EU Regulation does not induce EU Member States to violate their obligations towards the United States under the above-mentioned bilateral air services agreements.

## VI. ALTERNATIVE SOLUTIONS

### A. AMENDMENTS TO THE EU REGULATION

Although the EU Regulation fully complies with the principles set forth in the TBT Agreement, the Chicago Convention and the bilateral air services agreements, the EU Regulation could nonetheless be more consistent with some international obligations, especially with the TBT Agreement and with the Chicago Convention, if the following amendments were made. First, the Regulation would be more consistent with Article 2.8 of the TBT Agreement if it introduced a stricter standard based on performance characteristics rather than on design characteristics of aircraft engines. Even if the language of Article 2.8, i.e. "wherever appropriate," does not impose a strong obligation on WTO members to base their standards on performance characteristics, this standard is nonetheless clearly preferred since it is more transparent than design or descriptive standards. Accordingly, the EU Regulation could require aircraft serving Community airports to follow stricter noise performance limits than currently required by Chapter 3 of Volume I of Annex 16 to the Chicago Convention. In particular, the Regulation could require aircraft serving EU airports to respect a certain noise level expressed in X decibel, in accordance with the relative weight of the aircraft concerned, that is lower than the noise levels allowed under Chapter 3. Therefore, U.S. carriers would be more likely to meet the stricter performance standards and accordingly, the measure would have less impact upon these carriers.

Additionally, even if the various national registers are regarded as one Community register, the EU could allow for more flexibility towards third country carriers by amending the Regulation's transfer rule. One option would be for the EU to allow third country aircraft to be transferred from the register of one third country to another/EU Member State register between May 4, 2000, and April 1, 2002, without losing the right to operate in the EU after April 1, 2002, provided that this third country aircraft operated in the EU before May 4, 2000. A second option would be that the transfer of aircraft between the registers of EU Member States after May 4, 2000 would also bar these aircraft from serving Community airports after 2002. While the

first option is preferred because it is less contrary to the idea of the European Community as a single aviation market,<sup>204</sup> both solutions would put third country aircraft on a more equal footing with European carriers and would affect the resale value of older aircraft less significantly. Accordingly, third country aircraft would be given a fairer opportunity to compete in the Community air transport market.

Nevertheless, both solutions can be equally doubted since they seem to neutralize the environmental rationale of the Regulation. Indeed, the Regulation's aim is to prevent older aircraft with higher noise levels from coming into the Community. If the transfer of older aircraft will not prevent it from serving Community airports, a greater number of noisy airplanes will come into the Community after 2002. Accordingly, there will proportionately be more noise pollution in the vicinity of these airports.

#### B. A GLOBAL ENVIRONMENTAL SOLUTION

At the outset of ICAO, the zoning of airports and residential areas was viewed as the ideal solution in reducing noise at airports. Later, under the strong impetus of ICAO, the introduction and development of quieter aircraft was emphasized. In this context, ICAO adopted Volume I of Annex 16 to the Chicago Convention. This Annex sets out noise emissions standards, which have gradually developed into stricter standards.

Airport zoning, in conjunction with adopting noise emissions restrictions, significantly reduced noise pollution around airports in developed countries. However, taking into account the increased volume of air transport and the introduction of longer aircraft, the EU viewed it as essential to push for further noise reduction measures. In that context, and given the unexplained reluctance of the United States inside the ICAO forum to agree on Chapter 4 standards, the EU thought it was necessary to unilaterally adopt stricter standards, hoping to push the other contracting parties to do the same.

But considering the past difficulties encountered by the contracting parties within CAEP when trying to agree on stricter noise performance levels and notwithstanding the U.S. government's recent apparent willingness to expedite adopting such stricter noise standards, it is advisable to develop still further the possibilities offered by compatible land-use planning. The antic-

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<sup>204</sup> See Interview with Laurent Muschel, *supra* note 189.

ipated future growth in the volume of air traffic will lead to a further increase in noise levels around airports since noise levels near airports are determined not only by the fleet mix serving the airport, but also by the number of aircraft movements.

Compatible land-use planning and control is essential in ensuring that the current noise performance levels of aircraft are not worsened or offset by further residential developments around airports. Proper land use planning will prevent an increase in the number of people aircraft noise affects through limiting inappropriate development. It also avoids unreasonable constraints upon airport capacity and air transport.<sup>205</sup>

In addition, as ICAO suggested at the Earth Summit in Rio, there is a compelling need for adopting an international convention on environmental protection related to civil aircraft.<sup>206</sup> Such an instrument would be preferable since it could specifically address environmental issues related to civil aviation separately and would induce Contracting States to consider this area of environmental protection as an important matter in the future.

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<sup>205</sup> There appears to be some truth to the argument that people are able to purchase properties close to airports more cheaply in light of the noise factor. But then, as soon as the number of purchasers reaches some critical mass, they begin to organize to oppose the very noise factor that made their properties cheaper to buy. Just as such groups gain political prominence in the U.S., so too do they in Europe.

<sup>206</sup> See Statement from the International Civil Aviation Organization (ICAO) to the Fourth Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (visited Jan. 16, 2000) <<http://www.icao.int/icao/en/env/cop-4.htm>>.