AIRPORT NOISE POLLUTION

LEGAL ASPECTS

by

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ABSTRACT

This dissertation broadly explores the problems of aircraft noise in the vicinity of major airports.

Part 1 defines the technical terms of noise and sonic boom and discusses their harmful effects on airport neighbours and their environment.

Part 2 reviews international legal regulations, commencing with the conference convened by the British Government in 1966, and ending with the ICAO Council proposals to be addressed at the 28th (Extraordinary) Session of the Assembly, in October 1990. Further, ICAO efforts in balancing the conflicting interests between developed and developing countries is highlighted, and the legal status of Annex 16 on Environmental Protection is discussed in some detail.

Part 3 examines national legislation relating to aircraft noise with an emphasis on the approach of the United States.

Part 4 canvasses liability issues through an analysis of the jurisprudence in various countries with a concentration on litigation in the United States. Of particular relevance is the applicability of the 1952 Rome Convention with respect to damages caused by noise and sonic boom.

Part 5 examines and evaluates proposed and already implemented solutions to the airport noise problem.

RESUME

Cette thèse est concacrée à l' étude du problème de la pollution par le bruit dûe à l' aéronautique, dans les regions avoisinant les grands aéroports.

Dans la première partie, nous définissons les termes techniques qui se rapportent au bruit et au "boom sonic"; nous discutons des effets sur les personnes vivant près des aéroports et sur leur environnement.

Dans la deuxième partie, nous faisons une revue des réglementations en droit international, allant de la Conférence de 1966 convoquée par le gouvernement de la Grande Bretagne jusqu'aux propositions faites par le conseil de l' O.A.C.I. qui devront être examinées lors de la 28ème Session (extraordinaire) de l'assemblée en Octobre 1990. Nous y soulignons l'intérêt particulier des travaux de l' O.A.C.I. dans son effort pour concilier les intérêts divergents des pays développés et des pays en voie de développement; puis nous étudions de façon quelque peu détaillée le statut en droit de l' Annexe 16 sur la Protection de l' Environnement.

Dans la troisième partie, nous examinons le droit interne sur la réglementation du bruit par rapport à l' aeronautique, en nous appuyant sur l'approche américaine.

Dans la quatrième partie, nous abordons le débat sur les questions de responsabilité, revoyant pour cela la jurisprudence de divers pays, spécialement l'exemple des jugements rendus aux Etats-Unis sera. L'applicabilité de la Convention de Rome de 1952 quant aux dommages résultants du bruit et du "boom sonic" y sera d'une importance particulière.

Dans la cinquième partie, nous évaluons les solutions suggérées et celles déjà mises en pratique pour résoudre le problème de la pollution par le bruit près des aéroports.

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1. INTRODUCTION

1.1 The Problem (Noise as Pollutant)

Pollution is no longer acceptable as an inevitable consequence of technological advance. The same way as water and air pollution, noise is the result of the decision for technological progress at the expense of human environment.[1] The expression "human environment" encompasses natural and man-made elements, as affected by atmospheric pollution[2] caused by automobiles, industry and aircraft noise and emissions.

Maybe the most peculiar of all pollutants is noise, because it leaves no visible scars. This does not mean that noise should be neglected as a pollutant. It pollutes the environment as surely as chemical waste and smoke and thus demands equal attention. There is much evidence that long time exposure to noise may be both physiologically and psychologically harmful.[3]

The problem of noise pollution is obvious nowadays in the vicinity of major airports. The problem has become more acute since the advent of the jet engine during the Second World War, and the rapid development during

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[1] Kerse C S., The Law Relating to Noise, London, 1975.

[2] According to Davies III, The Politics of Pollution, 1970, pp. 18-19: The definition of pollution is subjective. It relates to the concept of human use and policy decision on how to use the environment in the best public interest. A definition that is given is that pollutants consist of substances which interfere with the use of air, water or soil for socially desired purposes. This means the wrong thing in the wrong place at the wrong time depending on someone's point of view

[3] Kramon J. M., "Noise Control: Traditional Remedies and a Proposal for Federal Action," Harvard Journal of Legislation (1970) 7.

the last thirty years of larger and noiser commercial jet aircraft.[4] The annoyance and disturbance caused by modern aircraft is created mainly by the noise of aircraft landing and taking off, taxiing around the aerodrome, and the testing, maintenance and servicing of aircraft engines on the aerodrome site. As a result of these procedures, a great deal of noise is confined to areas surrounding major airports, mainly disturbing communities living close to these areas, and people who live below air corridors, especially in the path of landing and taking-off. However, at high altitudes en-route aircraft emit minimal noise.[5] Because of the magnitude of the noise caused by aero-nautical activities, it is essential that airports are properly sited, carefully regulated and cause as little inconvenience as possible to adjoining premises and their occupants. Although an effort can be made with respect to the future planning of airport locations, the problem of noise pollution in the vicinity of airports is a social problem of today and requires legal attention.

1.2 Definition and Technical Characteristics of Noise and Sonic Boom

1.2.1 General principles

Noise has often been defined as "unwanted sound",[6] or as "sound which

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[4] Berger, M.M., "Nobody Loves an Airport," 43 Southern California Law Review, 631 (1970).

[5] Kerse C.S., The Law Relating to Noise, p. 73.

[6] Taylor, Noise, A Pelican Original, 1970.

is undesired by the recipient." [7] It has also been defined as "a sound without agreeable musical quality"[8] but can be thought of as well as wasted energy, and can be considered to be undesirable in the same way as the heat from a loaded bearing or the exhaust products from the internal combustion engine."[9]

Sound is created by any vibrating body which, in turn, sets the air near to it into vibrations. These vibrations are transmitted from one molecule of air to the next.[10] Sound can also be defined as a move motion in an elastic medium or the sensation of hearing produced by the wave motion. Air is a common elastic medium through which wave motions producing sound are transmitted.[11]

Although a definition of sound can be easily obtained, there has been a notable reluctance in both national and international legislative and judicial bodies to define noise when dealing with problems of the legal regulation of noise. This can be easily understood because what is unwanted sound to one person is pure music to the ears of another. The special meeting on aircraft noise[12] and the ICAO Committee on aircraft noise[13] have technically described noise at various levels without making any attempt to give any

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[7] Final Report of the Committee on the Problem of Noise. Presented to the Parliament by the Lord President of the Council and Minister of Science by Command of Her Majesty, July 1963. H.M.S.O., 1963. Cmnd. 2056.

[8] Bell A., Noise, An Occupational Hazard and Public Nuisance.

[9] "Fundamental Aspects of Noise and Sonic Boom." In Airports and the Environment, Stratford, A.H., 1974.

[10] Ibid: at p. 128.

[11] Yannacone & Cohen, Environmental Rights and Remedies, 1975, Vol. 2.

[12] ICAO Doc 8857, Noise (1969), Montreal, November 25 - December 17, 1969.

[13] Ecology Law Quarterly, Vol. 4:93, 1974.

comprehensive definition. Annex 16 to the Chicago Convention of 1944 on aircrafts noise[14] follows the same practice, without altering or contradicting the widely accepted definition attached to noise, which is "unwanted disruptive sound".

Since noise is sound, it would be good to have a more detailed picture about the generation, propagation and measurement of sound. As was said above, sound is created by any vibrating body which, in turn, sets the air near it into vibrations. If a receiver is placed in the path of these vibrations then the pressure vibrations are sensed. If the receiver is the human ear then the vibrations affect the ear drum, and its movement is transmitted to the hearing cells in the inner ear, and thus to the brain so as to give the sensation of hearing.[15]

Sound may be described by reference to three variables: intensity, frequency and duration. The character of sound is dependent upon the speed at which the source is vibrating and also upon the amount of movement and the size of the vibrator. The speed of vibration gives rise to the property of frequency or pitch of the sound, and the movement and size of the vibrator give rise to the property of intensity or loudness. Frequency is measured in hertz, which is the number of waves or vibrations made in a second. The unit of measurement of intensity of sound is called "decibel" (db) and is used for convenience sake in a logarithmic scale to the base ten. Whereas the frequency will determine the pitch or note of the sound, the sound pressure or

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[14] Annex 16 - Aircraft Noise, First Edition, August 1971.

[15] Stratford, A.H., Airports and the Environment, 1974.

intensity must be added in order for the "loudness" to be determined.[16]

While the db scale of sound intensity measurement constitutes the basis of all currently accepted sound measurement methods, it is in some way unsatisfactory because people react differently to different frequencies and therefore a low db level of high-pitched noise may be more objectionable than a louder (higher db level) noise composed of lower frequencies.[17]

To get around such measurement problems, acousticians have evolved the concept of "perceived noise level in decibels" (PNdb). The PNdb scale is the result of a mathematical formula which assigns more weight to the higher and more annoying frequencies in the sound being measured, than to lower and less annoying frequencies.[18] Acousticians injected the time factor to their measurement by introducing the composite noise rating (CNR). CNR expresses a value which reflects not only the intensity of individual noise occurrences and the sound frequency, but also their recurrence on a time scale.[19]

A quantitative measurement of a particular sound can be made by use of existing scientific instruments which determine accurately these three variables. Although a physicist can help our understanding and measurement of sound, physics does not have all the answers when it comes to defining noise. Since noise is defined as "unwanted sound", the decision whether a

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[16] Kerse C.S., The Law Relating to Noise.

[17] Kanner, G. "Some of My Best Friends Use Airports," California Trial Lawyers Association Journal, Vol. XII, No. 2 (1972).

[18] Kryter, "Concepts of Perceived Noisiness, Their Implementation and Application", 43, Journal of the Acoustical Society of America (1968).

[19] Ibid. at 355.

sound is a noise may be a purely subjective or personal one. Noise is closely linked with the ideas of disturbance and annoyance which in turn may be influenced by subjective factors such as familiarity and personal attitudes. There is not at present a scientific device to measure disturbance or annoyance objectively, nor there is any precise legal formula for deciding when a sound is a noise.[20]

In response to the need for a scale which measures the effect of sound on people, the International Organization of Standardization devised the "sone" or "phon" as a unit for measuring "loudness" at sound. This unit is based on the responses of average individuals to sound. As a method of measurement, a group of listeners, a "sound jury" is used rather than a mechanical instrument such as a decibel-meter.[21] Although this technique has a certain degree of objective utility, the "sone" and "phon" are seldom used and are unpopular units in the measurement of sound, because they do not respond to the needs of the legal system.[22]

From the above discussion, it is easy for one to understand that noise is a complex physical phenomenon which entails considerable definitional problems. Interesting is the opinion of Kerse on this matter:

> If noise is to be the subject of effective legal control it is arguable that it should be clearly defined by reference to objective parameters. When regulating

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[20] Handbook of Noise Control, Harris ed., 1957.

[21] Hilderbrand, I.L., Noise Pollution and the Law, 1970.

[22] It's not always easy to set up a "sound jury" and when this is feasible, a court or agency which must decide a particular controversy may be very uncomfortable with sones and phons as units of measurement with which to determine rights and liabilities. Kryter, "The Meaning and Measurement of Perceived Noise Level," Noise Control, Sept.-Oct. 1960.

> noise for the public good and well-being there is no place for the subjective standard or assessment. Clarity, certainty and precision are essential to social regulation.

He further suggests that objectives such as "excessive", "unnecessary" and "unreasonable" can be attached to noise by lawyers to impart some objectivity into the meaning and use of the word.[23]

1.2.2 Aircraft Noise:

Since the introduction of commercial jet transportation in 1958, the aircraft noise problem, though most acute around major airports, is very widespread. The main sources of jet aircraft engine noise are the roar of the jet exhaust and the whine of the compressor and fan. This engine-generated noise is a strongly resented and widespread environmental disturbance, whose origins and effects are more complex and harder to treat than chemical pollution.[24]

We can divide aircraft noise into two categories, namely the jet noise and the fan noise. The jet noise is the result of the interaction of the main exhaust flow from the engine with the surrounding air and is a stream of noise stretching out behind the engine, diminishing in intensity as the exhaust flow mixes with the surrounding air. Fan noise originates basically from the tips of the fan blades and it is easier to pin-point.[25]

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[23] Kerse, C.S., The Law Relating to Noise.

[24] Cornel and Bahr, "The Higher Bypass Jet Engine Designed for Fuel and Environmental Conservation", ICAO Bulletin, June 1975.

[25] Powers, J.O. "Airborne Transportation Noise, Its Origin and Abatement," Office of Noise Abatement, FAA, DOT, Prepared for the 74th Meeting of the Acoustical Society of America, November 13-17, 1967.

In the past, the major source of noise has been the jet exhaust and rotating machinery which were predominant in the early turbo-fan or fan jet engines. In recent years, as higher and higher by-pass ratio turbo fan engines have been introduced, the fan has started to become the principal source of noise. The roar of the jet exhaust is of concern primarily during the takeoff procedure. The whine of the compressor and fan is of concern primarily during the landing approach, particularly from a point some five miles from touchdown.[26]

The magnitude of the problem on the ground is determined by the intensity of the sound, the duration of the exposure to the sound, and the number of occurrences at different times of day and under various atmospheric conditions. It is considered that four noisy flights per hour over a given location may be acceptable or tolerable but, as the number of such flights increases, the total noise impact increases substantially and rapidly becomes intolerable.

Aircraft noise can be measured in a number of ways. It can be measured in decibels in terms of intensity level by calculating pressure on the ear. To put this in a perspective: a four-engine jet at take-off generates between 115 to 120 decibels. A dbA reading of 95 is considered to have a response criteria of "very annoying" and 135 dbA's is "painfully loud".[27]

The "Perceived Noise Level" (PNdB) scale, under which aircraft noise is frequently reported, takes into account frequency and pitch as well as intensity, in measuring jet noise, this distinction is important because the high-

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[26] Harper, D.V., "Regulation of Aircraft Noise of Major Airports: Past, Present, and Future", Transportation Law Journal, Vol. 17, 1988.

[27] Grad, F., Environmental Law (1970).

pitched scream of the jet engine is more annoying than an equal intensity level of a lower-pitched piston driven engine. There is evidence that with aircraft noise below 90 PNdB, there are almost no complaints. Between 90 and 105 PNdB, there are some, but not many, complaints. Above 105 PNdB, the volume of complaints increases rapidly with increasing PNdB levels.[28] The "Effective Perceived Noise Level" (EPNdB) scale, adds duration of the noise as a component to be calculated.[29]

Noise generated by aircraft can also be measured in terms of "noise footprints", technically known as "single event noise contour", using monitors which plot the geographical radius of PNdB or EPNdB measurements as a result of take-off or landing by a single aircraft.[30] However, as noted above, the aircraft noise problem at public airports increases with the frequency of flight operations and the average level of noise tolerated from each aircraft substantially decreases. The noise problem is more acute during landing procedures because landing approaches are generally less steep than climbouts after takeoffs and greater land area is exposed to low-altitude noise for a longer period of time.[31]

It should also be noted that because of the complex nature of the noise generated by airport and aeronautical operations, the airport noise problem must be treated as one with cumulative effects.

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[28] Kryter, "Evaluation of Psychological Reactions of People to Aircraft Noise," in Jet Aircraft Noise Panel, Alleviation of Jet Aircraft Noise Near Airports (1966).

[29] Lowenfeld, A., Aviation Law V, (1972).

[30] Donin, "British Airways v. Port Authority: Its Impact on Aircraft Noise Regulation," 43 Journal of Air Law and Commerce (1977).

[31] Harper, Transportation Law Journal, Vol. 17, 1988.

1.2.3 Sonic Boom:

The phenomenon of sonic boom is created when an aircraft is moving through the atmosphere at a speed greater than the speed of sound. To be more specific, the sonic boom is a pressure fluctuation produced by the displacement of air around the aircraft which is flying faster than the speed of sound.[32]

When the plane flies at subsonic speed, the sound waves that move out ahead of the plane in the direction of flight are closer together than those that move opposite the direction of flight, because the point of sound generation is moving forward. If the plane moves faster than the speed of sound, the collision of the aircraft structure with the air creates waves that expand essentially on top of one another.[33] As a result, the air in front of the wings is not able to separate and flow smoothly over the aerofoil, but is piled up until the pressure is such that it parts and flows over the wings. A similar action takes place at the trailing edge and there is a similar pressure change as the airflows join up again. Thus if the pressure was measured from just in front of the leading edge, across the wing chord to a point just past the trailing edge, two large jumps would be observed, an increase of pressure at the leading edge, and a decrease of pressure at the trailing edge. It is these two pressure changes which give rise to two waves of disturbance or "shock waves".[34]

The sonic boom sweeps away from the aircraft in the shape of a cone and it becomes progressively weaker as it travels further away from its point

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[32] Baxter, "The SST: "from Watts to Harlem in Two Hours", 21 Stanford Law Review, Nov. 1968.

[33] Ibid.

[34] Stratford, Airports and the Environment, 1974.

of origin. It is sometimes thought that a sonic boom is created only when an aircraft actually "breaks the sound barrier", but this is not so. A continuous sonic boom is created by an aircraft travelling with supersonic speed, although a person on the ground will only hear a boom once as the aircraft's shock wave reaches him. By the time the shock waves reach the ground they have expanded considerably in width, in the case of Concorde, the average width of the sonic boom carpet is about eighty kilometres.[35]

Where this cone impinges upon the ground, the effect on an observer is to experience very high levels of energy that is being released by the sonic boom. The angle in which the cone reaches the ground depends on a number of factors, such as the height and weight of the aircraft and the acceleration, and atmospheric factors such as air density, temperature and pressure.[36]

It should be kept in mind that the sonic boom effects only occur when an aircraft is travelling at supersonic speeds and that when operating subsonically the mechanisms of noise emissions obey the same rules as any other subsonic aircraft. This defines the sonic boom problem as one associated not with airports and the approach and departure patterns, but rather with flight corridors, because during take-off and landing procedures, the aircraft is operating in subsonic speeds.[37]

Finally, it should be noted that the subjective reaction to sonic boom is quite different from subsonic aircraft noise. The character of the phenomenon

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[35] ICAO Doc. 9064, Sonic Boom Committee and Meeting, Working Project 18 (SBC/II WP/18), Montreal. 19 - 29 June 1973.

[36] Ortner, A.J., "Sonic Boom: Containment or Confrontation." In: Noise Pollution and the Law, Hilderbrand (1970).

[37] Stratford, Airports and the Environment.

is such that no warning of the approach of the boom is given and consequently "startle effects" may be very large.[38]

1.3 Effects of Airport Noise

1.3.1 Effects on Communications

One of the most common and, therefore, most undesirable effects of noise is its interference with communications based on sound, with all that this implies in the disturbance of business efficiency and domestic life. Noise may interfere with communication by direct speech or telephone, and the enjoyment of radio and television programmes. It may also drown out alarms and other audible signals. This may not only cause inconvenience, but for example in the workplace, misheard directions may cause inefficiency and even accidents.[39] It is clear that loud noise may mask sounds of warning, or shouts, and the approach, for example, of trolleys and other moving objects.[40]

One of the most important forms of communication is teaching, and it would be appropriate to mention here the disturbing evidence which was received about the effects of aircraft noise on the schools in the neighbourhood of London (Heathrow) Airport. It is clear from the evidence given that in those schools which are close to aircraft flight paths the normal process of education is being seriously handicapped by noise.[41]

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[38] Ibid.

[39] Kerse, The Law Relating to Noise, at 5.

[40] Committee on the Problem of Noise, Final Report, H.M.S.O. (1964).

[41] Ibid.

The necessity to talk more loudly to overcome noise and misunderstanding may cause fatigue. However, individuals react differently to noise and it is difficult to prove, for example, that the employees become more tired working in a noisy environment than in a quiet one.[42]

[42] Kerse, at 6.

1.3.2 Effects on Health (Physiological and Pathological)

The two most common effects of excessive noise on health are nerve deafness and acoustical trauma.[43] The first occurs where the hearing mechanism is damaged by prolonged exposure to noise to the extent that the sensory nerve function is depressed and there is some degree of permanent hearing loss. Acoustical trauma or blast trauma results from a sudden burst-like noise like gunfire, which ruptures the eardrums or disrupts the chain of small bones that transmit the sound within the ear to the auditory nerve. In addition, the colchea or inner ear may also be damaged by exposure to noise thus causing permanent nerve deafness.[44]

Studies have also linked airport noise to an increased incidence of birth defects. Researchers believe that noise causes stress to pregnant women, which in turn harms the fetus. A Japanese study showed that babies born to mothers living near Osaka Airport weighed less than babies from quieter neighbouring areas.[45] A British study found a higher rate of still-births in Hounslow, a noisy district near Heathrow Airport, than elsewhere in the London area.[46] Similarly, a study of the area near Los Angeles International Airport showed a higher incidence of birth defects than in the United States as a whole.[47]

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[43] When we talk about excessive noise, we not only mean excessive in intensity, but also in duration, Kerse, C.S.

[44] Yannacone and Cohen, Environmental Rights and Remedies, 1972, p. 380.

[45] Ando and Hattori, "Statistical Studies on the Effects of Intense Noise During Human Fetal Life," 27 Journal of Sound and Vibration, 1973.

[46] Horner, J., The Health of Hillington, 1972.

[47] Jones and Tauscher, "Residence Under an Airport Landing Pattern as a Factor in Teratism", 33 Archives of Environmental Health, 1978.

In addition to hearing loss and birth defects, there may be a causal relationship between exposure to excessive noise and the incidence of heart disease and cardiovascular dysfunction, migraine headaches, gastrointestinal disorders, allergies, and other endocrine and metabolic effects.[48]

Finally, a study that was held during 1978 found that the death rate in neighbourhoods directly beneath the landing pattern of Los Angeles International Airport and within three miles of the airport was nineteen percent higher than that in neighbourhoods six miles from the airport.[49]

1.3.3 Habitability

This category includes annoyance, disturbance of sleep and distraction of work.

Noise is often regarded as one of the "tensions" of modern living and the potential psychological danger should not be neglected. Although people have different annoyance levels and responses, as a general rule, as noise increases man becomes more irritable and therefore more liable to irrational and neurotic behaviour. Dr. Fabian Rourke in his study for the New York Committee for a Quiet City[50] reported:

> One of the insidious aspects of excessive noise is the fact that an individual may be unconsciously building up nervous tension due to noise exposures. This may cause a person thus exposed to noise suddenly to be catapulted into an act of violence, or mental collapse, by some seemingly union sounds which

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[48] Welch, "Physiological Effects of Audible Sound," Science, Oct. 1969.

[49] Los Angeles Times, August 31, 1978.

[50] Committee for a Quiet City, Inc., Final Report and Recommendations, 1960, as quoted in Hilderbrant, p. 63.

> drive him beyond the point of endurance. Many persons who are using tranquilizers may be treating the symptoms rather than the disease.

There is also evidence that airport noise affects mental health. A 1971 British study found that nervous breakdowns were thirty-one percent more common in the areas around Heathrow than in a control area.[51] Other studies show that a higher incidence of mental hospital admissions in the areas around Los Angeles International Airport[52] and Heathrow London Airport than in other control areas.

Noise may have serious effects as well, if it interrupts sleep or interferes with performance and efficiency in the workplace. Adequate sleep is a physiological necessity and physical health will be prejudiced if sleep is prevented or interrupted by noise. Noise in the workplace may affect the rate of working and accuracy of work, even though the level of the noise is not great enough to be physically harmful or detrimental.[53]

1.3.4 Monetary Effects

The monetary effects of noise can be assessed by comparing the cost of escaping from it with the cost of putting up with it. Among possible indicators of such costs are falls in the value of houses and land affected by noise; the cost of moving house in order to get away from noisy areas; and the difference between the market values of houses and the subjective value which owners

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[51] Herridge and Chir, "Airport Noise and Mental Hospital Admission, 6 Sound, 1972.

[52] Meecham and Smith, "Effects of Jet Aircraft Noise on Mental Hospital Admissions," 11 British Journal of Audiology, 1977.

[53] Kerse, The Law Relating to Noise, at 9.

attach to them due to their surroundings, familiarity, proximity to friends and so on.

Studies of the monetary effects of noise, made by the Organization for Economic Co-operation and Development, have given results varying not only from one airport to another but from one place to another in the neighbourhood of the same airport. This is not surprising when it is remembered that there are housing shortages in most countries so that factors other than noise enter into house prices.[54]

We should not neglect though some other indirect costs of noise, measured in terms of expenditure on medical attention and pharmaceuticals, losses in labour productivity and educational attainment.[55] In the same category, we could classify economic loss that occurs due to the adverse effects of noise on animals that are kept or bred by some industries.[56]

1.4 Reflection of Airport Noise Effects on Social Relations

Since the early years of the century transportation has had an impact on the lives of the great majority of people living in the developed nations in the world. Its impact has had both favourable and unfavourable aspects.

Noise levels in some communities near major airports have become so intolerable that many residents cannot continue to live in those communities. This situation illustrates what is perhaps the basic conflict over aircraft noise,

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[54] Airports and the Environment, OECD, 1975.

[55] Ibid., at 28.

[56] Causby v. United States, 328 U.S. 256 (1946) and Nova Mink Farms v. Trans-Canada Airlines (1951) 2 D.L.R. 241, Nova Scotia Supreme Court.

namely that one group of people enjoys the economic benefits of the air transportation industry while a different group, which derives no such benefits is subjected to noise.[57]

On the other hand, there are very few people in developed and developing countries who do not reap daily benefits from the speed and flexibility of modern aircraft; it carries his mail, delivers his goods, sprays his crops, forecasts the weather and can transport him anywhere in the world within mere hours. Another factor that should also be considered is the contribution of air transport to the development of trade and commerce of a nation and consequently to its economy.[58]

Airport noise has become a public policy problem because it involves interests that should be balanced and controlled such as human health and well-being, and finance. It is obvious though that it is very difficult, if not impossible, to favour the well-being of the airports' neighbours without causing any harm or risking the economic strength of the airline industry and vice versa.

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[57] Anthrop, D.F., "The Noise Crisis", In: Noise Pollution and the Law, Hilderbrand, 1970.

[58] Hood, "The Jet-set and the Law," Pacific Law Journal, Vol. 1, 1970.

2. INTERNATIONAL LEGAL REGULATION RELATING TO NOISE

2.1 The British Initiative of 1966

The problem of airport noise pollution has not emerged in the last few years. Governments have been aware of it many years ago. The first initiative towards an intergovernmental consensus on noise control was taken by the British Minister of Aviation, Roy Jenkins, who in 1966 called an "International Conference on the Reduction of Noise and Disturbance caused by Civil Aircraft". All the countries engaged in civil aviation[59] were invited to discuss the problem of aircraft noise and its control.[60]

The conference was held in London in the form of Committees, each one of which dealt with different aspects of the problem. The issues studied during the conference were the design and construction of quieter engines; the mitigation of ground noise by proper choice of airport sites, careful preparation of airport wastes plans and restrictions to residential developments in the vicinity of airports; operational noise abatement procedures, to limit the disturbance caused by aircraft noise at take-off and landing; the methods that should be used to determine the maximum tolerable noise levels and to assess to what extent regulations are obeyed, insulation of buildings located near airports and the possibility of reducing noise caused by aircraft noise during

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[59] Twenty-six states and eleven International Organizations sent representatives to the Conference.

[60] Lloyd, "The Aeroplane as a threat to the Environment," Aeronautical Journal, October 1972.

maintenance or testing procedures.[61] After discussions that lasted a week, there was agreement on most of the issues, and the conference concluded that:

a. There is a need, if quieter aircraft are to be built, to include acoustic characteristics among aircraft certification criteria;

b. There is importance of establishing satisfactory procedures for specifying noise levels;

c. There is a need of insuring that land located in the vicinity of airports is used, insofar as possible, for purposes compatible with the degree of noise disturbance likely to be encountered;

d. Aircraft operational procedures can be made still more effective in respect of noise reduction if certain aircraft characteristics or equipment are modified, without involving any deterioration of safety levels, but with economic factors being taken into account.[62]

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[61] Balat, R., "Technical Aspects of the Aircraft Noise Problem", ITA Studies, 67/4-E, 1967.

[62] Ibid. at 6. See also "Aircraft Noise", British Board of Trade, November, 1966.

2.2 The ICAO Action

2.2.1 The Chicago Convention of 1944, the Air Transit Agreement and Bilateral Air Services Agreements

Aircraft noise regulations and other environmental standards can be legally based on the provisions of the Chicago Convention, the Air Transit Agreement and the bilateral Air Services Agreements.[63]

Although there are no specific rules in these instruments pertaining to aircraft noise, each state has reserved the authority to prescribe rules and regulations governing the operations of foreign aircraft within its territory. There are no restrictions imposed on the form in which these rules may appear; nor any constraint in relation with their content is set forth. As a result, national regulatory agencies are free to establish limits and regulations with regard to aircraft noise, affecting in this manner foreign aircraft, without violating rules of international law. However, these rules would be good to be set by ICAO for the sake of uniformity under the mechanism of Articles 37, 54(l) and 90 of the Chicago Convention.

The provision of Article 1 of the convention contains the principle of "complete and exclusive sovereignty" of a state over the air space of its territory, a principle that is recognized and respected by all contracting states.

Although each contracting state is bound, under Article 5, to allow aircraft of other contracting states to enter its territory for non-scheduled

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[63] The Convention on International Civil Aviation signed at Chicago, 1944, ICAO Doc. 7300/6, 1980; The International Air Services Transit Agreement, 1944, ICAO Doc. 7500.

services, or to cross its territory for the purpose of non-stop transit flights and to stop for non-traffic purposes without prior permission being necessary, the grant of such rights is expressly in this article "subject to the observance of the terms of this convention".

For scheduled international air services the convention provides in Article 6 that, they may be operated over or into the territory of a contracting state after special permission or other authorization is granted by that state, "and in accordance with the terms of such permission or authorization.

The most important provision of the Chicago Convention which may implicitly be related to noise regulation is article 11 which reads:

> Subject to the provisions of this Convention, the laws and regulations of a contracting state relating to the admission to or departure from its territory of aircraft engaged in international air navigation, or to the operation and navigation of such aircraft while within its territory, shall be applied to the aircraft of all contracting states without distinction as to nationality, and shall be complied with by such aircraft upon entering or departing from or while within the territory of that state.

As far as the domestic authorities impose conditions which are uniform to aircraft of all contracting states at every airport open to public use, provisions of the Convention will not be violated.

According to Articles 17-21 of the Convention (nationality of aircraft), states have authority to prohibit or regulate flights of aircraft of their own nationality wherever they may be, and consequently they may attach noise as a factor for the grant of registration or certification.

Article 2 of the International Air Transit Agreement[64] provides that the

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[64]ICAO Doc. 7500, 1944.

agreement is subject to the provisions of the Chicago Convention, and the provisions mentioned above are also applicable.

Bilateral air services agreements that are concluded between states for the grant of commercial traffic rights may contain provisions similar to those of Article 11 of the Chicago Convention.[65] They may also contain specific rules relating to noise, as in the case of the agreement between the Government of the United Kingdom and Northern Ireland and the Government of the Soviet Socialistic Republic concerning Air Services and Amendments.[66]

2.2.2 The Developments in ICAO Committee on Aircraft Noise and Annex 16

The International Civil Aviation Organization, after the British initiative of 1966 has taken measures on the international level to reduce noise generated by aircraft. The first formal ICAO policy was promulgated at the eighteenth Assembly in 1971 by the adoption of Resolution A18-11.[67] This resolution was adopted unanimously and established the ICAO position for the Human Environment Conference held in Stockholm in 1972, which recognized the adverse effects on the environment caused by advances in modern civil aviation.

ICAO's efforts to mitigate the noise levels in the vicinity of airports had

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[65] See the United States standard bilateral air services agreement. Article 5 repeats the provisions of article 11 of the Chicago Convention.

[66] Bin Cheng, The Law of International Air Transport, 1962.

[67] ICAO Doc. 8958, A18-RES, Vienna 15 June - 7 July, 1974.

started a few years prior to the United Nations Conference on the Human Environment held in Stockholm. The sixteen Assembly session held in Buenos Aires in September, 1968, adopted resolution A16-3, with title Aircraft Noise in the Vicinity of Airports. The resolution came after recommendations of ICAO Fifth Air Navigation Conference, held in Montreal in November, 1967, and instructed the Council:

> (1) to call an international conference within the machinery of ICAO as soon as practicable, bearing in mind the need for adequate preparation, to consider the problem of aircraft noise in the vicinity of airports.
>
> (2) to establish international specifications and associated guidance material relating to aircraft noise.
>
> (3) to include, in appropriate existing Annexes and other relevant ICAO documents and possibly in a separate Annex on noise, such material as the description and method of measurement of aircraft noise and suitable limitations on the noise caused by aircraft that is of concern to communities in the vicinity of airports, and;
>
> (4) to publish such material on a progressive basis, commencing at the earliest possible time.[68]

As a result of the concern voiced by resolution A16-3, ICAO convened, in November and December 1969, a special meeting on aircraft noise in the vicinity of aerodromes. This meeting, attended by 161 persons, representing 28 states, one non-contracting state, and 9 international organizations, had as its main goal development of noise certification standards for future subsonic airplanes for inclusion in a new Annex to the Chicago Convention.[69] The

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[68] ICAO Doc. 8779. Assembly Resolution. A16-3, Buenos Aires, September 1968.

[69] Fitzgerald, G.F., "Aircraft Noise in the Vicinity of Aerodromes and Sonic Boom", University of Toronto Law Journal, Vol. 21, 1971.

main questions considered were: the preparation of standardized methods to represent and measure aircraft noise; human tolerance to noise in the vicinity of aerodromes; noise certification; criteria to be selected in drawing up operating procedures for aircraft noise alleviation, land use control; and noise alleviation procedures during ground run-ups.[70]

The meeting, first of all, worked out a detailed plan for the noise certification of aircraft and basic international certification specifications. The main purpose of the certification plan was to reduce noise from future subsonic aircraft to levels far below that of machines which already existed. Aircrafts and engine manufacturers would have to find ways of bringing aircraft noise down to levels enabling them to comply with noise certification standards. The meeting also recommended that ICAO should very quickly examine the problem of reducing the noise of existing aircraft and proposed the creation of a working panel to study this question.[71] It was also agreed that the noise certification plan should apply to all turbojet subsonic aircraft with a weight of over 5,700 kg, other than aircraft certificated for a runway length of at most 450 metres and powered:

- either by engines with by-pass ratio[72] at least 2;
- or by other categories of engines for which the application for the prototype airworthiness certificate had been accepted after 1 January 1969.

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[70] ICAO Doc. 8857, Noise, Aircraft Noise in the Vicinity of Aerodromes, Report of the Special Meeting on Aircraft Noise in the Vicinity of Aerodromes, Montreal, 25 November - 17 December, 1969.

[71] Ibid.

[72] The ratio of the air mass flow through the by-pass ducts of a gas turbine engine to the air mass flow through the combustion chambers calculated at maximum thrust when the engine is stationary in an international standard atmosphere at sea level.

The Federal Aviation Administration of the United States had already published its own regulations shortly before November 1969. They apply to aircraft for which the airworthiness certificate had been requested as from 1 January 1967. A very inflexible attitude could have been expected on the part of the U.S. delegation so as to have U.S. standards adopted internationally, but it was recognized that ICAO standards concerning noise certification could be different and considered as a minimum, with each state able to apply stricter provisions to aircraft operating in its territory.[73]

The work of this meeting resulted in the adoption of draft International Standards and Recommended Practices for Aircraft Noise which the council of ICAO adopted on April 1971 to form the text of Annex 16 on Aircraft Noise.[74] Subsequently, the ICAO Council during its meeting on February 3, 1970 established the Committee on Aircraft Noise (CAN) to assist in the development of international specifications for noise certification of aircraft and associated equipment. Since then, the CAN has expanded the items covered in Annex 16 following these steps:

November 1971	CAN/2 Meeting. The Committee develops standards to cover production and developed versions of non noise-certificated subsonic jet aeroplanes manufactured after January 1976.[75]
March 1973	CAN/3 Meeting. The Committee develops recommendations for the extensions of the

[73] ITA Bulletin, "New ICAO Regulations on Noise Certification", No. 6, 9 February, 1970.

[74] Annex 16 - Aircraft Noise, First Edition, August 1971.

[75] ICAO Doc. 8993, CAN/II, Montreal, 15-26 November 1971.

applicability of noise certification standards to subsonic jet aeroplanes of 5700 kg or less and for the noise certification of light propeller driven aeroplanes.[76]

January-February 1975 — CAN/4 Meeting. The Committee develops:

(a) more stringent noise certification standards for new subsonic jet aeroplanes (for which the application for type certification is submitted after 6 October 1977) and their derivatives;[77]

(b) standards for noise certification of heavy propeller driven aeroplanes other than STOL[78] aeroplanes; and

(c) guidelines for noise certification of future supersonic transport aeroplanes, propeller-driven STOL aeroplanes and installed auxiliary power units (APUs) and associated aircraft system when operated on the ground.[79]

October 1976 — The Second Edition of Annex 16 incorporating all the above-mentioned amendments was issued with date to come into force 6 October 1977.[80]

November 1976 — CAN/5 Meeting. The Committee revises the noise certification requirements for new subsonic jet aeroplanes formulated at the CAN/4 Meeting, introducing number of engines as an additional parameter for determining the permissible noise levels.[81]

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[76] ICAO Doc. 9063, CAN/3 Montreal, 5-23 March, 1973.

[77] An aircraft which, from the point of view of airworthiness, is similar to the noise certificated prototype but incorporates changes in type design which may affect its noise characteristics adversely.

[78] Short take-off and landing.

[79] ICAO Doc. 9133, CAN/4, Montreal, 27 January - 14 February, 1975.

[80] Annex 16 - Environmental Protection, Volume I.

[81] ICAO Doc. 9197, CAN/5, Montreal 15-30 November 1976.

March 1978 — The Third Edition of Annex 16 incorporating amendments resulting from CAN/5 recommendations was issued with date to come into force 10 August 1978.

May-June 1979 — CAN/6 Meeting. The Committee develops:
(a) noise certification standards for helicopters;
(b) noise certification standards for future production and derived versions of existing supersonic aeroplanes; and
(c) further refinements in the existing noise certification requirements for subsonic jet aeroplanes and propeller-driven aeroplanes.[82]

During the same meeting, it was proposed that Annex 16 should be retitled Environmental Protection and to be issued in two volumes as follows: Volume I - Aircraft Noise and Volume II - Aircraft Engine Emissions.

May 1983 — CAN/7 Meeting. The Committee proposes:
(a) improvements in the noise certification procedures; and
(b) relaxation of maximum noise limits for helicopters.[83]

June 1986 — First meeting of the Committee on Aviation Environmental Protection which proposed:
(a) further improvements in the noise certification procedures;
(b) introduction of a new chapter 10 for propeller-driven aeroplanes not exceeding 9.000 kg maximum certificated take-off mass and;[84]

The above proposals were adopted as amendments to Annex 16 by the

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[82] ICAO Doc. 9286, CAN/6, 6th Meeting, Montreal 23 May - 7 June 1979.

[83] ICAO Doc. 9419, CAN/7, Montreal 2-13 May, 1983.

[84] ICAO Doc. 9499, CAEP/1, Montreal 9-20 June, 1986.

ICAO Council at its meeting on the 4th of March, 1988, and are applicable since 17th November 1988, and form part of Annex 16 as it is in force today.

At this point, we should see the position that different states have been holding during these years of evolution of the rules of Annex 16. There are mainly two groups of states, the interests of which ICAO has been trying to balance: on the one hand, those with noise problems at their airports which introduce relevant prohibitions of non-noise certificated aircraft; and on the other hand, states, particularly from developing regions, which expected to experience severe hardship when noise prohibitions were introduced in the first group of states. The main concerns of developing states is for the economic and financial viability of their air carriers.[85]

During its twenty-third session, the ICAO Assembly adopted Resolution A23-10,[86] requesting states not to prohibit before 1 January 1988 the operation of foreign registered subsonic jet aeroplanes not conforming with noise certification standards of Annex 16.

The problem was even more burning during the twenty-sixth session of the ICAO Assembly held in Montreal, 23 September - 10 October 1986. The subject generated considerable discussion at the Seventh and Eighth Meeting of the Executive Committee, where states considered the possibility of establishing a new implementation schedule for noise standards under Assembly Resolution A23-10. Many delegations expressed support for any decision that might alleviate the difficulties of developing countries in this regard and sought a flexible approach to the problem. The delegations

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[85] "African Airlines concerns over Noise Regulations", Interavia Air Letter, No. 11,087, September 19, 1986.

[86] ICAO Doc. 9316, A23-RES., Montreal 16 September - 7 October, 1980.

underlined once more the fact that the problem before the Committee, while vital to environmental considerations and the welfare of human beings, had severe economic dimensions for developing countries, many of whom were struggling under heavy debt burdens. Implementation of Resolution A23-10 prohibition date would mean that operation of a portion of the fleet of some airlines, and in some cases the entire fleets, which did not meet noise certification requirements under Chapter 2,[87] would be prohibited to certain regions, and could result in the grounding of aircraft that otherwise could continue in service for many years. In the same meeting, the delegations also considered the problems arising out of possible restrictions on continued production and operation of subsonic jet aeroplanes not complying with the more stringent noise certification requirements of Chapter 3.[88]

As was expected two main points of view were expressed: One of the developing countries, that states could agree to extend the implementation date of Resolutions A23-10 by some five years; and one of the developed countries, that they considered the granting of exemptions on an ad hoc basis, bilaterally and regionally, a preferable course of action to changing the implementation date. The states of this group had serious problems because governments had already introduced legislation which conformed with Resolution A23-10 agreed

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[87] Annex 16, Vol. I, Chapter 2 applies with some exemptions to subsonic jet aeroplanes whose application for certificate of airworthiness for the prototype was accepted before 6 October 1977.

[88] Annex 16, Vol. I, Chapter 3 applies to: (1) Subsonic jet aeroplanes -- Application for certificate of airworthiness for the Prototype accepted on or after 6 October 1977. (2) Propeller-driven aeroplanes over 5700 kg -- Application for certificate of airworthiness for the Prototype accepted on or after 1 January 1985 and before 17 November 1988. (3) Propeller-driven aeroplanes over 9000 kg -- Application for certificate of airworthiness for the Prototype accepted on or after 17 November 1988.

six years ago and it would be unrealistic to expect such legislation to be changed, particularly in the light of ever-increasing pressure on governments from environmental groups.[89]

In a spirit of compromise, the committee proposed a resolution (7/4) which reflected the will of states to compromise and was adopted by the Assembly as Resolution A26-11[90]. It reads as follows:

WHEREAS restrictions on the use of aircraft operated by carriers of ICAO Member States are a problem of general interest which must be resolved by the international aeronautical community;

WHEREAS the adoption of unilateral measures in this sphere seriously jeopardises the stability of air transport and the principles laid down in the Chicago Convention of 1944 concerning cooperation in international civil aviation and its utilization to the benefit of all nations and peoples of the world;

WHEREAS experience has shown that economic pressures and competition are driving airlines towards renewing their fleets with modern, fuel-efficient and more quiet aircraft;

NOTING that the Twenty-Third Session of the Assembly, in Resolution A23-10, addressed the problem of noise international standards for subsonic jet aircraft under Chapter 2, Part II of Annex 16 (Third Edition) and that some Contracting States intend, consistently with Resolution A23-10, to apply Chapter 2, Part II restrictions on 1 January 1988 and have practical or legal difficulties in adopting a new implementation date;

WHEREAS the Third Air Transport Conference, responding to widespread concerns that the implementation of Annex 16 standards in accordance with Resolution A23-10 would impose severe economic and financial hardship and number of airlines, requested the Council to study the possibility of establishing a new implementation schedule for noise standards under Resolution A23-10;

WHEREAS the Council has identified the extend of aircraft operations that could, potentially, be adversely affected by the application of noise restriction on 1 January 1988;

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[89] ICAO Doc. 9489, A26-Ex, Assembly 26th Session, Executive Committee, Report and Minutes, 1986.

[90] Ibid.

WHEREAS the environmental effect of the adoption of provisions to prohibit the use of foreign aircraft which do not meet the noise certification requirements in Chapter 3, Volume I, Annex 16 has not yet been studied on a worldwide basis;

WHEREAS, furthermore, such restrictions would impose a heavy economic burden on the airlines of those countries which do not have the financial resources to re-equip their fleets; and

WHEREAS resolution of noise problems must be based on the mutual recognition of the difficulties encountered by Contracting States and a balance among their different concerns;

THE ASSEMBLY:

1. STRONGLY ENCOURAGES contracting states to continue to co-operate bilaterally, regionally and/or inter-regionally in order to alleviate the severe economic hardship which some airlines would suffer if Chapter 2, Part II restrictions were imposed from 1 January 1988;

2. URGES contracting states which impose such noise prohibitions in accordance with Resolution A23-10 to grant exemptions for up to two years from the date of such an imposition for existing levels of service and frequencies through mutually acceptable temporary agreements;

3. REQUESTS the Council to study as a matter of urgency the economic implications of limiting operations of subsonic jet aircraft which comply with Annex 16, Vol. I, Chapter 2, but which do not meet with Annex 16, Volume I, Chapter 3, with a view to making recommendations to the next ordinary Session of the Assembly;

4. URGES all Contracting States to abstain from adopting provisions to prohibit the use to or from their territories of subsonic aircraft of foreign registration which comply with Annex 16, Volume I, Chapter 2 but which do not meet the noise certification standards in Annex 16, Volume I, Chapter 3, pending further review of the recommendations of the Council, at the next ordinary session of the Assembly in the light of which action will be taken.

2.2.3 Recent Developments, and the Proposals for the next Extraordinary Session of the ICAO Assembly

The ICAO Council pursuant to Resolution A26-11 assigned the Secretariat, with the assistance of a group of experts from States and the

industry, to carry out a study on the economic implications of possible future operating restrictions on subsonic jet aircraft which are not required to meet the noise certification standards of Annex 16, Volume I, Chapter 3 (that is non-noise certificated aircraft and Chapter 2 aircraft).

The results of this study were presented by the Council[91] during the Twenty-Seventh Session of the ICAO Assembly, held in Montreal from 19 September to 6 October 1989. During the discussions in the Executive Committee, there was general acceptance that there was an urgent need for that Session of the Assembly to adopt an integrated approach that would recognize the differing needs and constraints in different regions and would produce a clearly defined policy on noise restrictions and their application. It was believed that in the absence of a co-ordinated international approach to this issue the risk of unilateral actions by individual airports or states would be likely to increase, with the relevant problems for other airports and States, as well as for aircraft operators It was also believed that it was the task of that Assembly to resolve the issue and find the necessary balance between environmental and economic concerns.[92]

Many delegations expressed appreciation for the work of the Council and the Secretariat, and expressed general support for the draft resolution contained therein. However, there were differing views regarding the developments and amendments to these draft proposals in the various other working papers. Some delegates drew the Committee's attention to the extreme political pressures in many countries for action to protect the

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[91] ICAO Doc. A27-WP/47, EX/12, 28/6/89.

[92] ICAO Doc. 9594, A27-EX, Montreal 19 September - 6 October 1989.

environment. On the other hand, many delegates[93] expressed the view that the draft resolution did not go far enough in protecting the economic interests of States which were not intending themselves to introduce operating restrictions, for many of which the impact of operating restrictions by other countries would be critical not only for their airlines but also for the well-being of their economies as a whole.

Because of the wide diversity of views expressed, the Committee decided to establish a Working Group, composed of one or two representatives from each of the eight world regions, to work on the proposed draft resolution. The report of the Working Group was presented to the Executive Committee which noted that the Group had been able to agree on the general wording of a revised text for all the Resolving Clauses of a draft resolution, with few exceptions which it referred to the Committee for consideration. However, the Group had found considerable difficulty in reaching compromises regarding the earliest acceptable date of phased operating ban on Chapter 2 aircraft,[94] and the guaranteed operating life of Chapter 2 aircraft,[95] as well as the nature and duration of possible exemptions to each of these elements. Although developed and developing countries made some concessions, the Group had been unable to reach an agreement.

The Executive Committee recognized that there were fundamental principles and concerns at stake as regards each of these issues, stemming on the one hand mainly from powerful environmental pressures and on the other

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[93] WP/123, presented on behalf of thirty-one African States.

[94] The initial views had ranged from 1 January 1995 to 1 January 2000.

[95] The initial views had ranged from twenty-three to thirty years.

hand from critical economic problems. As a result, the Committee proposed a solution which was adopted by the Assembly, that the question of operating restrictions in relation to aircraft noise should be referred to the next Extraordinary Session of the Assembly, on the understanding that no unilateral action would be taken in the meantime by any State or group of States regarding the introduction of operating restrictions on Chapter 2 aircraft.[96]

Since then, the Council referred the issue for consideration by the Air Transport Committee, which has undertaken an extensive study of the issue of operating restrictions related to aircraft noise and presented proposals which it believes should serve as a basis for the adoption of a comprehensive world-wide agreement by the Assembly during its Twenty-Eighth (Extraordinary) Session, which will be held from 22 to 26 October, 1990.[97]

The Committee is proposing a new framework for the phasing-in of any operating restrictions on Chapter 2 aircraft over a period of time, but the commencement date and duration of this period have not been specified because the Committee believes that they are policy matters which are properly the responsibility of the Council and ultimately the Twenty-Eighth Session of the Assembly.[98] In the draft Assembly working paper, the Committee draws the potential global impact of introducing the framework of different times, by showing the estimated number of Chapter 2 aircraft which would be subject to the phasing-in of operating restrictions by States in the

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[96] ICAO Doc. 9545, A27-EX, and ICAO Doc. 9550, A27-Min P/1-16, Plenary Meetings; Minutes.

[97] ICAO Doc. C-WP/9083, 7/5/90.

[98] See Resolving Clauses 2 a) and b) of the draft Resolution in Appendix A.

"noise-restricted areas".[99] On the issue of aircraft life, the Committee's Working Group concluded that a reasonable lifespan for the purpose of not curtailing aircraft life unduly in the context of noise related operating restrictions, covering all types of Chapter 2 aircraft, would be 25 years. Although some members of the Committee noted that inclusion of such an aircraft life guarantee would have the impact of delaying withdrawal of some Chapter 2 aircraft, it was finally agreed that lack of specification at this time would complicate more the task of the Assembly.[100]

2.2.4 The Legal Status of Annex 16 on Environmental Protection

Before we go any further we should see what is the legal status of the provisions included in the Annexes to the Chicago Convention and consequently the provisions of Annex 16 on Environmental Protection.

The Chicago Convention in article 37 states that every contracting State has an obligation[101] to:

> "...collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures, and organization in relation to aircraft, personnel, airways and auxilliary services in all matters in which such uniformity will facilitate and improve air navigation."

The adoption of such standards and recommended practices is one of

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[99] It is assumed that "noise-restricted areas will consist of the territories of the twenty-three Member States of the European Civil Aviation Conference, Australia, New Zealand, and the United States. See also Appendix B for the estimated number of Chapter 2 aircraft subject to phasing-in of operating restrictions commencing on different dates.

[100] ICAO Doc. C-WP/9083, 7/5/90.

[101] The wording of article 37 shows that States have to co-operate: "Each contracting State undertakes.....".

the mandatory functions of the ICAO Council, as it is stated in article 54(l), and are designated as Annexes to the Chicago Convention for the sake of convenience. The procedure which the Council follows in adopting the Annexes is described in chapter XX of the Convention.[102]

This function of the Council is described as quasi-legislative rather than legislative because the standards are not binding on member States against their will.[103] It is true that with some exceptions[104] States have no legal obligation to implement or to comply with the provisions of a duly promulgated Annex, unless they find it practicable to do so.[105]

This position, that the standards prescribed in an Annex are not binding legislative enactments as that concept is traditionally understood, is emphasized by the wording of article 38 of the Chicago Convention.[106] Its provisions in

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[102] Actually Chapter XX of the Convention (ANNEXES) includes only article 90 which has the title "Adoption and amendment of Annexes".

[103] Cheng Bin, The Law of International Air Transport, Oceana Publications, New York, 1962.

[104] See article 12 of the Chicago Convention pertaining to rules of the air governing flights over the high seas.

[105] See the wording of articles 22 and 23 of the Chicago Convention where the spirit of the Convention is apparent.

[106] Article 38 reads:
"Any State which finds it impracticable to comply in all respects with any such international standard or procedure, or to bring its own regulations or practices into full accord with any international standard or procedure after amendment of ther latter, or which deems it necessary to adopt regulations or practices differing in any particular respect from those established by an international standard, shall give immediate notification to the International Civil Aviation Organization of the diferences between its own practice and that established by the international standard. In the case of amendments to international standards, any State which does not make the appropriate amendments to its own regulations or practices shall give notice to the Council within sixty days of the adoption of the amendment to the international standard, or indicate the action which it proposes to take. In any such

fact provide that it is for each contracting State to decide whether or not to comply with or give effect to an international standard, because by requiring the notification of differences in all these cases in which a State might depart from the provisions of an international standard, article 38 recognizes that the contracting States are free not to adhere to these regulations.[107] According to the same article, this notification may be made by individual States either before or after an Annex has come into force. In other words, a State may decide at any time not to comply with a given international standard, except those which incorporate rules of the air applicale over the high seas. The same conclusion applies to recommended practices, because they are non-obligatory by definition.[108]

In conclusion we could say that international Standards and Recommended Practices (SARPS) which are incorporated in Annexes apply to member States on a contracting-out basis. This means that a contracting State is, in the eyes of the ICAO international community, bound to implement the provisions of an Annex, unless it has filed a difference in accordance with the provisions of article 38 of the Chicago Convention.

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case, the Council shall make immediate notificaton to all other States of the difference which exists between one or more features of an international standard and the corresponding national practice of that State."

[107] Buergenthal Thomas, Law-Making in the International Civil Aviation Organization, Syracuse University Press, 1969.

[108] ICAO Doc. 4411 (A1-p/45), Assembly Resolution A1-31, 1944.

3. NATIONAL LEGISLATION RELATING TO AIRCRAFT NOISE.

3.1. The U.S. Regulatory Approach

The nation with the greatest airport noise problems in the world is the United States of America. The Federal Aviation Administration (FAA) estimated in 1986 that approximately five million United States airport neighbors reside within areas affected by an average day-night sound level of sixty-five decibels or greater.[109] Although there have been numerous attempts to reduce the amount of noise emitted by aircraft and to make the noise more acceptable to airport neighbors, the problem still exists. Today, the problem has become increasingly acute with the expansion of the airline industry.[110]

Regulations relating to airport noise control may be promulgated by the federal government, or the local government or even by the airport proprietors.

3.1.1. Federal Regulation

Until the beginning of 1985, the Civil Aeronautics Board (CAB) was responsible for carrying out federal economic regulation of air transport, which included controlling entry into the industry. Although the CAB could attach

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[109] Federal Aviation Administration, Alternatives Available to Accelerate Commercial Airport Fleet Modernization 11, 1986.

[110] Harper Donald V., "Regulation of Aircraft Noise at Major Airports: Past, Present, and Future", Transportation Law Journal, Vol. 17, 1988.

conditions and limitations to the certificates of public convenience and necessity it issued, it did not do so in terms of noise abatement because it did not believe that economic regulation included regulation of noise produced by the airlines certificated by the CAB. This was rather a problem that had to do mainly with the character of the airport, an FAA problem, than whether or not an airline should serve a given point. The refusal of the CAB to be a participant in the regulation of aircraft noise, left the other federal agency (FAA) concerned with aviation, alone to deal with the problem.

The principal aviation responsibilities assigned to the Federal Aviation Administrator, and since 1966 the Secretary of Transportation, are the safety and promotion of air commerce.[111] The Federal Aviation Act of 1958 gave the Federal Aviation Administration (FAA) power to regulate the nations navigable airspace Section 1508 provided that "the United States of America is declared to possess and exercise complete and exclusive national sovereignty in the airspace of the United States...",[112] giving this power to the federal government. Furthermore, the Secretary of Transportation has broad authority to regulate the use of the navigable airspace "in order to insure the safety of aircraft and the efficient utilization of such airspace..."[113] and "for the protection of persons and property on the ground."[114] This grant though of exclusive jurisdiction, concerns only the airspace of the United States. Consequently, the states have some jurisdiction over the ground activities at

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[111] Federal Aviation Act, 49 U.S.C. para. 1301-1303 (1976).

[112] 49 U.S.C., para. 1508 (1970).

[113] 49 U.S.C. para. 1348 (a).

[114] 49 U.S.C. para. 1348(c).

airports.

Under the provisions of the Act of 1958, the FAA was the authority to issue "type" certificates for aircraft, aircraft engines, and propellers if it is found that such aircraft, aircraft engine, or propeller is of proper design, material specification, construction and performance for safe operation.[115] The FAA has also the authority to certify the airworthiness of aircraft. In both cases, the FAA may prescribe in the certificates issued any terms, conditions, and limitations as are required in the interest of safety.[116] As a result of these provisions, the FAA has the power to determine which aircraft and aircraft engines should be permitted to be used in the United States. The objective behind this control is safety. While the airport noise problem was growing in the United States in the 1950's and 1960's, the FAA believed that aircraft noise was not a safety factor and therefore, it was not its task to accept or reject aircraft and engines by taking into consideration issues like noise.[117] The FAA preferred to handle the noise problem through voluntary cooperation among the aircraft and engine manufacturing industry, airlines, and airport operators, and by conducting research.

The first major attempt by Congress to legislate on the problem of aircraft noise was the Aircraft Noise Abatement Act of 1968.[118] This Act amended the Federal Aviation Act of 1958,[119] and explicitly gave the FAA

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[115] 49 U.S.C. para. 1423 (a).

[116] 49 U.S.C. para. 1423 (c).

[117] The Federal Aviation Act of 1958 does not include any provisions at all with respect to aircraft noise emissions.

[118] Aircraft Noise Abatement Act of 1968, Pub. L. No. 90-411, 82 Stat. 395.

[119] The Amendment was codified at 49 U.S.C. 1431.

the authority to consider noise as a certification factor. The primary purpose of the amendment was "to afford present and future relief and protection to the public from unnecessary aircraft noise and sonic boom".[120] Section 611 of the Act, as amended, required the Administrator of the FAA, to prescribe and amend standards for the measurement of aircraft noise and sonic boom and to prescribe rules and regulations necessary to provide for the control and abatement of aircraft noise and sonic boom. As noise reduction was used as a criterion of issuance and revocation of aircraft certificates, the FAA had to consider, while adopting any noise regulations: (1) whether it is technically practicable, (2) whether it is consistent with the highest degree of safety and (3) whether it is economically reasonable.[121]

In November of 1969, the FAA promulgated under its new authority the first aircraft noise regulations, commonly known as Federal Aviation Regulations, Part 36 - Noise Standards: Aircraft Type Certification, or FAR 36.[122] This regulation set the principal rule in the FAA's program to control noise at the source. FAR 36 required that applicants for new type certificates show compliance with the noise levels established in the new regulation. With respect to previously certificated aircraft, aircraft with high bypass ratio engines and for which application was made prior to January 1, 1967, it was provided that they had to meet the new noise standards or to show that the noise emitted was reduced to the lowest levels that were economically reasonable,

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[120] Id.

[121] 49 U.S.C. para. 1431(d).

[122] 14 CFR para. 36 (1977).

technologically practicable, and appropriate to the particular type of design.[123] For aircraft with high bypass ratio engines for which application was made on or after January 1, 1967, it should be shown that the noise levels that were emitted were no higher than the standards set forth in the new regulations.[124] For aircraft which did not have high bypass ratio engines[125] and for which application was made before December 1, 1969, it should be shown that the lowest reasonably obtainable noise levels were achieved. For those which application was made on or after December 1, 1969, it had to be shown that the noise generated by their engines did not exceed the standards set forth by the new regulations.[126]

The noise limits were introduced in FAR 36 in the form of a sliding scale which is keyed to the maximum loaded weight of each type of plane, permitting greater noise from heavier aircraft.[127] The regulations also contained a tradeoff feature allowing excess noise at one of three measuring points to be offset by less noise at another point.[128] For the heaviest planes,

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[123] This provision applies to the first version of the Boeing 747 because it was already in production at that time.

[124] These provisions applied to wide-bodied jets which were developed at that time, such as the later version of Boeing 747, Douglas DC-10, and Lockheed L-1011.

[125] This category includes the Boeing 707, 727, 720, and 737, Douglas DC-9, General Dynamics Convair 990, and British Aircraft Corporation BAC 111.

[126] Harper Donald V., "Regulation of Aircraft Noise at Major Airports: Past, Present and Future", Transportation Law Journal, vol. 17, 1988.

[127] 14 C.F.R. para. 36.5 (1979).

[128] Id. para. 36.5(b). The noise emitted is measured on takeoff at 3.5 miles from the beginning of take off roll, on landing at one mile from the beginning of the runway; and a quarter mile from the side of the runway where the noise is greatest after takeoff.

the FAR 36 standards allowed a maximum output of 108 EPNdB,[129] while at that time noisiest commercial jets operated between 118 and 120 EPNdB.[130]

The regulations introduced by FAR 36 have been criticized because: (1) they do not apply to all aircraft; (2) they do not mandate the development of new noise reduction technology (they rather have institutionalized existing industry practice); and (3) their effect has been counteracted as the rapid growth of the airline industry. This last argument is based on the fact that while individual planes are becoming quieter, the aggregate noise is greater because they are more planes in operation.[131]

Three years after the adoption of FAR 36, Congress passed the Noise Control Act of 1972,[132] which brought the Environmental Protection Agency (EPA) into the aircraft noise controversy. The Act of 1972 instructed the EPA to conduct a nine-month study on the adequacy of the FAA noise regulations and to recommend noise control rules to the FAA.[133] However, it was up to the FAA to decide whether to accept or reject the recommendations. The FAA had to publish the proposed rules in thirty days and commence hearings thereon in sixty days. The FAA was also required, within a reasonable time either to adopt the proposed rule or publish a notice declining to promulgate

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[129] See page 10 for information about the "Effective Perceived Noise Level".

[130] This is a noise level which is perceived by the human ear to be more than twice as loud as 108 EPNdB.

[131] Bell Robert B. and Bell Lisa M., "Airport Noise: Legal Developments and Economic Alternatives", Ecology Law Quarterly, vol. 8:607, 1980.

[132] Pub. L. No. 92-574, 49 U.S.C. para. 1431 (1982).

[133] 42 U.S.C. para. 4906 (1977).

the rule and to furnish an explanation.[134] The role of the EPA turned out to be minimal, because the regulatory power remained with the FAA.[135]

In 1973, the FAA made the FAR 36 regulations applicable to most older designed aircraft with maximum weights over 75,000 pounds (e.g. Boeing 727), to be manufactured after December 1, 1973. These new rules that were adopted meant that narrow-bodied aircraft produced before December 1, 1973, were still not required to meet the 1969 noise standards.[136]

By the mid-1970's, the FAA was accused of "regulatory paralysis", because while it acted swiftly in regulating noise emissions for aircraft of new design in 1969 and newly manufactured aircraft of types that had already been certificated in 1973, nothing was done with respect to aircraft that were already in service.[137] At that time, many lawsuits were filed against the federal government by some states, for federal government's failure to implement EPA recommendations on aircraft noise regulation.[138] Airlines on the other hand, were complaining about lack of standardization in noise regulation caused by diverse approaches to noise control exercised by local governments and airport operators. From the airlines' point of view federal standards were preferable.

The FAA, at the end of 1976, finally took action in the matter, with the

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[134] 49 U.S.C. para. 1431(c)(1).

[135] FAA had a veto power over the recommended regulation by EPA if safety would be compromised or because the standards were technologically or economically not feasible.

[136] Noise Standards for Newly Produced Airplanes of Older Type Design, 38 Fed. Reg. 29,569 (1973).

[137] North, "Current State of the Law in Aircraft Noise Pollution Control", 43 Journal of Air Law and Commerce, 1977.

[138] In the mid-1970's, only twenty percent of the U.S. airline fleet met the FAR 36 standards.

adoption of the Aviation Noise Abatement Policy.[139] According to the new policy, aircraft used by United States carriers in domestic service should gradually meet the 1969 FAR part 36 standards by January 1, 1985, either through replacement of the aircraft or through retrofitting. The Aviation Noise Abatement Policy of 1976 included a Federal Action Plan, an Air Carrier Action Plan, and a plan calling for Local Actions. The Federal Action Plan contained operating procedures such as minimum altitude rules and approach procedures.[140] It also included an airport development air program which called for the establishment of a high priority for the use of Airport and Airway Trust funds over airport land acquisition, for the purchase of noise suppressant equipment and for other noise reducing measures.[141] The Air Carrier Action Plan, as previously presented, dealt primarily with FAR 36 compliance and the necessary retrofit financing.[142] The Local Actions Plan called for land use planning and zoning in areas surrounding airports to ensure that the land use was compatible with noise exposure in those areas. It further provided that purchasers of real estate near airports should be given notice of the aircraft noise exposure.[143]

In 1977[144] and 1978,[145] the FAA issued new noise regulations which

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[139] U.S. Department of Transportation, Federal Aviation Administration, Aviation Noise Abatement Policy (1976) (D.O.T. Washington D.C.).

[140] Id. at p. 8.

[141] Id.

[142] Id. at p. 9.

[143] Id. at p. 10.

[144] Noise Level Limits and Acoustical Change Requirements for Subsonic Transport Category Large Airplanes and for Subsonic Turbojet Powered Airplanes, March 3, 1977, 42 Fed. Reg. 12, 360, codified at 14 C.F.R. para. 36.101.

applied to aircraft to be certified in the future and created three categories of aircraft according to their noise emissions. Stage I aircraft are those aircraft that did not meet the 1969 standards and were to be eliminated or retrofitted by 1985. Stage II aircraft are those that meet the 1969 standards and State III aircraft are those that meet the lower noise levels set forth in 1977 and 1978 for newly certified airplanes. The new regulations increased the minimum level of federal noise protection by reducing the allowable level of noise emissions for aircraft designed after November 5, 1975.[146] Furthermore, the FAA promulgated regulations to limit the noise emissions on the existing carrier fleet. These regulations required an estimated number of 1600 aircraft, designed before 1969 and exempt from the FAR 36 Standards, to comply with the 1969 regulation, either by a phase-in of quieter aircraft or a retooling of existing aircraft.[147] The new regulation created controversy in the air carrier industry because of the cost of implementing the new requirements, but the FAA concluded that the societal benefits outweighed the cost of implementation.[148]

Before the aviation industry was required to meet the compliance deadlines adopted in 1976 and 1977, Congress passed the Aviation Safety and

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[145] 43 Fed. Reg. 8,722, March 2, 1978, codified at 14 C.F.R. para. 36.101.

[146] The allowable level of noise emissions vary between 89 and 106 decibels, depending upon the size of the aircraft and the number of the engines. This limit is referred to as stage III noise limit.

[147] 14 C.F.R. para. 91.305 (1986). The FAA regulation required each air carrier to have 50% of its carrier fleet in compliance by January 1, 1981 and 100% compliance by January 1, 1983

[148] Rockett Robert J., "Airport Noise: Did the Airport Safety and Noise Abatement Act of 1979 solve the problem?", 52 Journal of Air Law and Commerce, 1986, pp. 499-527.

Noise Abatement Act (ASNAA) of 1979. This act extended the technology implementation deadlines for two-engine aircraft requiring 100 percent compliance from January 1, 1983 to January 1, 1985, for aircraft with 100 or more seats, and January 1, 1988 for those with fewer than 100 seats.[149] The Act of 1979 also extended the technology implementation deadlines for both two and three-engine aircraft if the operator had by January 1, 1983, made arrangements for replacement of the aircraft with one that would meet the noise requirements.[150]

The ASNAA differed from the FAA regulation because it provided financial incentives to encourage airport operators to voluntarily implement noise controls.[151] These incentives included eligibility for federal grants to airport proprietors that submitted noise exposure maps to the FAA.[152] These maps were prohibited to be used as evidence in noise suits against airports,[153] and airport proprietors were relieved from liability to landowners who acquired their property subsequent to submission of a noise exposure map.[154] Congress by this provision alone provided a vehicle for reducing the airport noise litigation, since many airports have filed or will file these maps,

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[149] 49 U.S.C. para. 2124 (1982). This was referred to as the small community service exemption.

[150] 49 U.S.C. para. 2123 (1982). The deadline for two-engine aircraft was extended to January 1, 1985, and for three-engine aircraft to January 1, 1986.

[151] 49 U.S.C. para. 2103-04 (1982).

[152] Id. The Noise Exposure Maps show the incompatible land was in the airport area and the noise levels as determined under the ASNAA noise measurement system.

[153] 49 U.S.C. para. 2106 (1982).

[154] Id. para. 2107 (1982).

and the number of potential litigants diminishes every time real property in the airport vicinity changes hands.[155]

Furthermore, the 1979 Act provided that the FAA require United States and foreign air carriers engaged in foreign air transportation to comply with noise standards set forth in FAA regulations or with International Civil Aviation Organization noise standards, that are substantially compatible with FAA noise standards. By November 1980, the ICAO[156] had done nothing to establish noise standards so the FAA ruled that its noise regulations would apply to aircraft in foreign commerce, although they were made subject to the January 1, 1985 deadline without the phase-in feature.[157]

However, the availability of hush-kits by the deadline date concerned Congress, which encouraged the FAA to use its exemption power under the original Federal Aviation Act of 1958 and the Noise Regulation Act of 1968, to exempt some aircraft from the deadline. The House Conference Committee also identified five considerations to be taken into account in determining whether a carrier deserved an exemption. These five criteria were: (1) small carrier size; (2) demonstrated good faith compliance; (3) unavailability of technology; (4) resultant financial havoc; and (5) loss of valuable air service.[158] Although these criteria were not present in any statutory or

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[155] See Rockett note 148, at p. 512.

[156] For the ICAO action, see para. 2.2.

[157] This must also be seen in the international context. A month before this FAA action was taken, ICAO Assembly had adopted Resolution A23-10 calling member states to take no unilateral action on the matter, because this would "...pose a serious risk for the stability of air transport and the principles laid down in the 1944 Chicago Convention for co-operation and utilization of international civil aviation for the benefit of all nations and peoples of the world".

[158] H.R. Rep. No. 96-715, 96th Cong., 1st sess. 23.

regulatory language, the FAA recognized these criteria as the test of granting an exemption.

As the deadline date approached, the FAA recognized that nearly all the carriers requesting exemptions met the small size and unavailability of technology criteria. The response came from Congress in October 1984 by amending (Hawkins-Chiles Amendment) the Act of 1979. The amendment eliminated four of the five suggested exemption criteria in use by the FAA, and left only the criterion of having made a good faith compliance effort.[159] The Hawkins-Chiles Amendment also required the FAA to grant exemptions for flights to and from Miami, Florida and Bangor, Maine, provided the carrier had entered into or had commited to a hush kit contract.

During 1984 and 1985, the FAA granted a number of exemptions and issued a larger number of denials of such exemptions.[160] At that time, many lawsuits were filed by carriers who objected to the exemptions given to others after they themselves had spent considerable money to meet the January 1, 1985, deadline and by carriers who had been denied exemptions.

In early 1985, in Airmark Corporation v. FAA,[161] a United States Court of Appeals held that the FAA arbitrarily and capriciously exercised its exemption power, and the FAA instead of the court should determine what criteria the FAA should use. The court also vacated thirteen of twenty FAA decisions and stated that while the FAA retained broad discretion in determining whether granting or denying exemptions best served the public

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[159] This effort should be in the form of a contractual commitment to retrofit or replace a non-complying aircraft. Publ. L. No. 98-473, para. 124 (1984).

[160] Some of the exemptions granted involved Bangor or Miami.

[161] 758 F. 2d 685 (D.C. Cir. 1985).

interest, any criteria chosen must apply to all exemption requests in a consistent manner. Furthermore, any deviation from previous rulings required a reasoned explanation.[162]

An immediate response to that decision came from the FAA, which reinstated the above mentioned five criteria when granting exemptions, and by May 1985, it had approved 17 percent of the 113 applications sought under the exemption authority. The exempted aircraft could not be operated beyond December 31, 1985, except where the operator had a firm retrofit commitment for delivery after that date, but in any case no longer than December 31, 1986.[163]

By 1988, the air carriers had complied with the regulations set forth by the FAA in 1976 and 1977-78.

3.1.2. Local Noise Control Regulation

Between 1971 and 1976, noise-related litigation cost airport owners in excess of 28 million dollars. Airport owners have tried to reduce their liability through a number of regulatory and statutory enactments whose purpose was to reduce noise at airports. Local governments have attempted to reduce airport noise through regulation which is based on their police powers as well as their rights as airport proprietors. In exercising these powers, some conflicts

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[162] Id. Also Bates Timothy M., "FAA Regulatory Power-Noise Restrictions", 52 Journal of Air Law and Commerce, 1986, p. 193.

[163] "Transportation Department Defends Noise Exemption Policy as Judgment Calls", Aviation Week and Space Technology, May 27, 1985, p. 36.

may arise between state and federal area of control and local governments may face possible Supremacy Clause and Commerce Clause problems. In an effort to resolve these conflicts, courts have viewed these cases from two perspectives: the kind of power exercised, and the types of control used.[164]

As early as 1955 in Allegheny Airlines v. Village of Cedarhurst,[165] the court dealt with an ordinance passed by the Village of Cedarhurst, New York which prohibited planes from flying over its areas at an altitude lower than a thousand feet. Cedarhurst was located near the airport, but did not own or operate it. Although federal regulations required all flights over populated areas to be at altitudes in excess of a thousand feet, the Court held that the federal government had preempted the field of air traffic regulation under the Commerce Clause.

In 1968, in American Airlines Inc. v. Town of Hempstead,[166] the Second Circuit of Appeals invalidated a town ordinance forbidding anyone from operating any device (including aircraft) which generated noise in the town exceeding a certain ground level decibel limit, by holding that the ordinance was in direct conflict with federal law.

The above two cases show that local and state statutes can be invalidated as conflicting with federal regulation in two ways: (1) by being in direct conflict with a federal statute in a field which the constitution has reserved for the federal government, and (2) by having its entire power to

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[164] Muss, "Airport Noise: Federal Pre-emption of Local Control, Concorde and Other Recent Cases", 43 Journal of Air Law and Commerce, 1977.

[165] 132 F. Supp. 871 (E.D. N.Y. 1955), affirmed 238 F. 2d 812 (2d Circ. 1956).

[166] 398 F.ed 369 (2d Cir. 1968).

regulate in an area negated under the concept of preemption.[167]

The U.S. Supreme Court in 1947 in Rice v. Santa Fe Elevator Corporation[168] summarized the tests for Congressional intent for Preemption. Justice Douglas stated on the matter: "We start with the assumption that the historic police powers of the states were not to be superseded by the Federal Act unless that was the clear and manifest purpose of Congress.... Such a purpose may be evidenced in several ways"[169] like in cases where:

> (1) The scheme of federal regulation may be so pervasive as to make reasonable the inference that Congress left no room for the states to supplement it.[170]
>
> (2) The act of Congress may touch a field in which the federal interest is so dominant that the federal system will be assumed to preclude enforcement of state laws on the same subject.[171]
>
> (3) The object sought to be obtained by the federal law and the character of obligations imposed by it may reveal the intent to preclude local regulation.[172]
>
> (4) The state policy may produce a result inconsistent with the objective of the federal statute.[173]

In 1963, the U.S. Supreme Court dealt again with this issue and developed two guidelines for determining Congressional intent to preempt a field. This intent must be assumed where "the nature of the regulated subject

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[167] See Muss, supra note 164.

[168] 331 U.S. 218 (1947).

[169] Id. at 230.

[170] Id.

[171] Id.

[172] Id.

[173] Id.

matter permits no other conclusion or that Congress has unmistakably so ordained."[174]

The landmark case on the issue of whether a local government could legislatively restrict airport noise is City of Burbank v. Lockheed Air Terminal, Inc.[175] In this case, a group of private owners of an airport brought a lawsuit against the City of Burbank, California, seeking an injunction against a city council ordinance which made it illegal for jets to take off from Hollywood-Burbank Airport between 11 P.M. and 7 A.M. The ordinance affected only one intrastate flight each evening at: 11:30 P.M.. The Court in striking down the imposed curfew, stated that "the pervasive nature of the scheme of federal regulation of aircraft noise... leads us to conclude that there is pre-emption."[176] Furthermore, Douglas,J. writing for the majority in the much-quoted footnote 14 added:

> The letter from the Secretary of Transportation also expressed the view that "the proposed legislation will not affect the rights of a state or local public agency, as the proprietor of an airport, from issuing regulations or establishing requirements as to the permissible level of noise which can be created by aircraft using the airport." Airport owners acting as proprietors can presently deny the use of their airports to aircraft on the basis of noise considerations so long as such exclusion is nondiscriminatory.... But, we are concerned here not with an ordinance imposed by the City of Burbank as "proprietor" of the airport, but with the exercise of police power.... Thus, authority that a municipality may have as a landlord is not

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[174] Florida Lime and Avocado Growers Inc. v. Paul, 373 U.S. 132, 142 (1963).

[175] 411 U.S. 624 (1973).

[176] Id. at 633-37. The Court also stated that "state and local governments are pre-empted from establishing or enforcing noise emission standards for aircraft unless such standards are identical to standards prescribed under the Noise Control Act of 1972."

> necessarily congruent with its police power. We do not consider here what limits, if any, apply to a municipality as a proprietor.[177]

Burbank left open the possibility that airport operators, acting in their proprietary capacity, could regulate aircraft noise so long as they did not attempt to regulate flight or interfere with aviation safety. Lower federal courts and state courts have interpreted Burbank as allowing proprietary controls . In Air Transport Association of America v. J.R. Crotti,[178] a federal district court reviewed a 1970 California law[179] which required the California Department of Aeronautics to promulgate noise regulations for the operation of all aircraft at all airports in California, except those operated by the federal government. The regulations at issue had two parts. The first, Single Event Noise Exposure Level (SENEL) established maximum noise emission levels for planes in flight. The second, Community Noise Equivalent Level (CNEL) established a system of measuring ambient community noise levels and prohibited incompatible land use, such as housing, within high noise impact areas after 1985.

The Crotti court held that the CNEL regulations were constitutional because they did not attempt to regulate aircraft in flight (which is a preempted area), while the SENEL provisions were invalidated because they would interfere with the federal regulatory scheme by prescribing noise levels for planes in flight.[180] The court relied on the legislative history of Section

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[177] Id. at 635-36, note 14.

[178] 389 F. Supp. 58 (N.D. Cal. 1975).

[179] Calif. Publ. Util. Code, Section 21669-21669.4.

[180] Leschner, "The Concorde and Local Control of Airport Noise: Federal Preemption?" 13 New England Law Review, 473 (1978).

611 of the Federal Aviation Act and on the Burbank distinction between proprietors and nonproprietors to conclude that airport proprietors must have the power to control the use of the airport if they are to be held liable for noise damages.[181] The court, however, did not consider what limitations, if any, might apply to these proprietary controls.[182]

The case of British Airways Board v. Port Authority of New York[183] involved an attempt of the Port Authority to prevent test flights of the Supersonic Concorde at John F. Kennedy Airport in New York. The court recognized the Authority's right as airport proprietor to use reasonable, non-arbitrary, and nondiscriminatory rules to define permissible levels of aircraft noise.[184] In this case, the Port Authority opposed Concorde test flights even though the plane was capable of meeting noise standards that the Port Authority had applied to all other aircraft.[185] The court found that the Port Authority actions were "unreasonable, arbitrary, and discriminatory, and dissolved the ban on Concorde flights.[186]

Two California district court decisions are good examples of cases where the court upheld airport proprietor restrictions. The cases are National Aviation v. City of Hayward[187] and Santa Monica Airport Association v. City

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[181] Crotti, 389 F. supp. at 63-64.

[182] Id. at 65.

[183] 431 F. supp. 1216 (S.P.N.Y.), reversed, 558 F. ed 75 (2d cir.), on remand, 437 F. supp. 804 (S.D.N.Y.), affirmed, 564 F.2d 1002 (2d Cir. 1977).

[184] B.A.B. v P.A.N.Y., 564 F. ed at 1011.

[185] Id.

[186] Id. at 1011-12.

[187] 418 F. Supp. 417 (N.D. Cal. 1976).

of Santa Monica.[188] In the first case, the City of Hayward imposed a curfew, prohibiting airplanes exceeding a certain noise level from taking off between 11:00 P.M. and 7:00 A.M.[189] In the second case, the City of Santa Monica prohibited airplane take offs between 11:00 P.M. and 7:00 A.M. and imposed a noise level restriction on all aircraft using the airport.[190] In both cases the district courts, after balancing the effects of the respective ordinances on interstate commerce against the local interest supporting the legislation, ruled in favor of the local controls.[191] However, the Santa Monica court did strike down an ordinance banning all jets from the airport as discriminatory, because some propeller airplanes were noiser than jets.[192]

A 1985 New York case[193] involved a rule of the Port Authority of New York and New Jersey that limited the proportion of total flight operations of Stage I aircraft at the Authority's airports. The plaintiff Arrow Air, Inc. asked for an exemption from that rule and argued that the rule caused an undue burden because it would alter the carrier's market and cause economic harm. The court held that the rule was not preempted by the federal government and that the burden on interstate commerce was only incidental because other carriers could provide the service in question and at the same time comply with

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[188] 481 F. Supp. 927 (C.D. Cal. 1979).

[189] Hayward, 418 F. Supp. at 419.

[190] Santa Monica, 481 F. Supp. at 922-4.

[191] Santa Monica, 481 F. Supp. at 938-40 and Hayward, 418 F. Supp. at 428.

[192] Id. It must be noted that the ban was imposed without FAA approval.

[193] Arrow Air, Inc. v. Port Authority of New York and New Jersey, 602 F. Supp. 314 (S.D.N.Y. 1985).

the rule.[194] Furthermore, the court decided that since the rule was consistent with Federal noise policy, it was not subject to the Commerce Clause even if did amount to more than an incidental effect on interstate commerce. In the same case, the court found that the refusal to grant an exemption was done in a nondiscriminatory manner because only one exemption had been granted to a carrier under highly specialized circumstances.[195]

In reviewing the jurisprudence on this issue, it is clear that local government regulation is not possible under the police power, because of the federal preemption, conflict with federal regulation, and interstate commerce doctrines. This makes sense because an airport located among several localities could be subjected to many conflicting regulations.[196] On the other hand, where only one controlling entity, such as the airport proprietor, establishes permissible noise levels of its facilities it will not be disturbed by the courts so long it does not create an impermissible burden on interstate commerce, does not conflict with federal regulation, is nondiscriminatory and this kind of action is not preempted by federal law or regulation.[197]

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[194] Id.

[195] Id.

[196] Harper Donald V., "Regulation of Airport Noise at Major Airports: Past, Present, and Future", Transportation Law Journal, Vol. 17, (1988) at 138.

[197] Id.

3.2 Provisions Relating to Noise in Other Countries

In addition to the United States many other countries in their domestic legislation deal with the control of airport noise.

In Great Britain, Section 8 of the Civil Aviation Act, 1949, gives power to the Crown to give effect to the Chicago Convention of 1944 by making provisions to regulate the operation of aerodromes and the safety of aircraft, and to prohibit aircraft from flying over such areas of the country as may be specified. The same Act in Section 41 empowers the Crown to regulate the conditions under which noise and vibration may be caused on airports. Following the above mentioned sections, the Air Navigation Order of 1972[198] provides that the Secretary of State may prescribe the conditions under which noise and vibration may be caused by aircraft on government airports, airports owned or managed by the Civil Aviation Authority, licensed airports or on airports where aircrafts are manufactured, repaired or maintained. The conditions under which noise and vibration may be caused by aircraft on such airports are mentioned in the Air Navigation Regulations of 1972.[199]

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[198] Statutory Instrument, 1972, No. 129, Article 73.

[199] Statutory Instrument 1972 No. 322, Article 12. The Regulations State that noise and vibration may be caused on such aerodromes whether in the course of manufacture or otherwise:

(a) by aircraft taking off or landing, or
(b) by aircraft moving on the ground or on water, or
(c) by the engines being operated in the aircraft -
  (i) for the purpose of ensuring their satisfactory performance,
  (ii) for the purpose of bringing them to a proper temperature in preparation for or at the end of a flight, or
  (iii) for the purpose of ensuring that the instruments, accessories or other components of the aircraft are in a satisfactory condition.

The Air Navigation Order of 1972 makes no reference to the amount of noise that can be generated, and it is presumed to be unrestricted. This fact is very important because Section 41(2) of the 1949 Civil Aviation Act, explicitly provides that "No action shall lie... in respect of nuisance, by reason" of noise and vibration caused by aircraft on an aerodrome which the above orders and regulations apply so long as aircraft are operated pursuing to the provisions of those Orders. These legislative provisions present a most substantial obstacle to success of claims in respect of what might otherwise constitute an actionable nuisance in many cases.[200]

The Airports Authority Act of 1965, introduced the British Airports Authority and transferred to it the airports of Heathrow, Gatwick, Stansed and Prestwick. Section 14 of this Act empowers the Secretary of State to require the British Airports Authority to take measures for limiting noise and vibration or mitigating their effect. The Authority also controls noise generated from ground running of aircraft engines. Section 15 states that if further protection is needed for dwellings near one of the Authority's airports, the Secretary of the State is empowered to make a scheme requiring the Authority to make grants for the insulation of such dwellings against noise.[201]

Where the airport is managed by a local authority, that authority may regulate its airport by the use of bylaws.[202] With respect to municipally owned airports, governmental regulation and control is imposed, pursuant to

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[200] McNair, The Law of the Air, 3rd Ed., Stevens and Sons, London (1964).

[201] Id.

[202] See for example Section 12 of the 1971 Manchester Corporation Act which empowers the corporation to make bylaws for controlling the operation of aircraft using Ringway airport for the purpose of mitigating or preventing aircraft noise.

the provisions of the Civil Aviation Act of 1971. The Act, in Part II, section 29, deals with the regulation of noise and vibration from aircraft operated in one of the "designated" airports.[203] Section 29 makes reference to the duties of the aircraft operator[204] and the duties of the airport manager.[205]

In Canada, the whole field of aerial navigation legislation belongs to the federal government, but the Aeronautics Act[206] makes no explicit reference to noise generated by aircraft. The federal Minister of Transport can make regulations governing the conditions for use and operation of aircraft.[207] Following these provisions, the Air Regulations as amended in 1972 (amendment P.C. 1972-1813) in Section 515 provide:

> (2) subject to subsection (3), no person shall fly an aircraft in such a manner as to create a shock wave or sonic boom, the effect of which may imperil the safety of other aircraft, be injurious to persons or animals or cause damage to property.
>
> (3) The Minister may make orders or directions with respect to the operations of aircraft in sonic or supersonic flight.

Municipalities can pass bylaws for licensing, regulation and prohibition of the erection of aerodromes, relying upon a Provincial Statute.[208] In 1971, the Ontario Court of Appeal delineated the areas of jurisdiction between federal

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[203] Statutory Instrument 1971, No. 1687, The Civil Aviation (Designation of Aerodromes) Order, 1971.

[204] The Civil Aviation Act, 1971, Part II, Section 29(1)-(4).

[205] Id. Section 29(5)-(8).

[206] R.S.C., 1970.

[207] Id. Sections 6(1)(d) and 6(1)(h) or routes and their use and Control.

[208] See for example the Airports Act of Ontario, R.S.O. 1970.

and provincial governments by stating:

> ... the whole object, scope and effect of the Aeronautics Act... is to provide for all matters relevant to aerial navigation... [and] the beneficial use of any lands surrounding an airport is a matter solely under the control the provincial authorities... [and] any beneficial uses of the land which would not interfere with or affect aerial navigation are not the subject matter of the Aeronautics Act; the remain solely within the jurisdiction of the Province.[209]

In 1976, ICAO conducted a comparative study of national laws, intending to prepare an instrument on liability for damage caused by noise and sonic boom.[210] The study showed that many countries deal with the aircraft noise problem in their respective domestic law.

In Argentina, the Aeronautical Code in Article 155 provides for restitution for all damage sustained by third parties on the surface, including damage due to abnormal aircraft noise, through application of the principles of strict liability.[211]

In Austria, the Air Traffic Act (Sections 19-29) establishes liability only for damage caused by an accident which is defined as a "sudden damaging event occurring from outside". Consequently, liability for noise and sonic boom can only be established if the damage arises out of a single sudden event. However, according to Section 1293 of the Austrian Civil Code, continuous

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[209] Bramalea Consolidated Developments Ltd. v. Attorney-General for Ontario and the Minister of Municipal Affairs of Ontario, [1971]2 O.R. 570 at 571 per Aylesworth, J.A. as cited in Silverman and Evans, "Aeronautical Noise in Canada, Osgoode Hall Law Journal, Vol. 10, No. 3, 1972.

[210] ICAO Doc. LC/Working Dratt No. 854-2, 1976, Legal Committee,22nd Session.

[211] Id. at p. 2.

damage gives rise to compensation if the operation itself is unlawful. In practice, this kind of air traffic operations are difficult to establish.[212]

In Denmark, under the Aviation Statute of 1960 (as amended in 1974) the Minister of Transport may introduce rules with regard to air traffic in the airports and in the air, with references to the Prevention of inconveniences caused by noise (Articles 70-82). Article 9 provides that the Minister may attach noise requirements to conditions relating to aircraft registration. Supersonic flight is prohibited over Danish territory under article 1 of the 1972 Statute on Civil Supersonic Aircraft. It must be noted that Danish law contains penal provisions in case of violation of these noise rules.[213]

In the Federal Republic of Germany, the Law on Protection Against Aircraft Noise (1971), in Article 29(b) provides:

> (1) Airport operators, aircraft operators and pilots shall be responsible for preventing, in connection with the operation of aircraft both in the air and on the ground, avoidable noise, and for limiting the emission of unavoidable noise to a minimum if it is necessary to protect the population from dangers,... Consideration shall particularly be given to the night rest of the population.
>
> (2) The aviation authorities shall undertake to assure the protection of the population with respect to unreasonable aircraft noise.[214]

In France, the Civil Aviation Code provides protection to owners of private property if flights are conducted in a manner incompatible with the

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[212] Id. at page 12.

[213] Id. at page 15-16.

[214] Id. at pages 15-16.

rights of the proprietor, but certain measures to mitigate noise are allowed.[215]

[215] Code de l'Aviation civile, Decret no. 55-1590 (1955), Loi no. 53-515 (1963).

4. LIABILITY ISSUES

4.1 The 1952 Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface

The Rome Convention of 1952[216] is the only private international law instrument that refers to damage caused by aircraft noise. Although the Convention does not have the support of the most important aviation nations,[217] it should be determined whether the Convention covers damages caused by aircraft noise, and if so, to what extent. This is important because in some countries, the Rome Convention applies equally to domestic flights.[218]

The Convention explicitly denies compensation "if the damage results from the mere fact of passage of the aircraft" through the airspace in

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[216] ICAO Doc. No. 7379, LC/134, Convention on Damage caused by Foreign Aircraft to Third Parties on the Surface, Rome, September - October, 1952.

[217] Only twenty-eight states have ratified the Convention. These are: Algeria, Argentina, Australia, Belgium, Brazil, Canada, Cuba, Ecuador, Egypt, Gabon, Haiti, Honduras, Iraq, Italy, Luxembourg, Mali, Mauritania, Morocco, Niger, Nigeria, Pakistan, Paraguay, Rwanda, Spain, Sri Lanka, Tunisia, United Republic of Cameroon and as of November 6th, 1975 Papua New Guinea.
ICAO Doc. No. 9131-LC/173-2.

[218] Mankiewicz R.H., "Some Aspects of Civil Law Regarding Nuisance and Damage caused by Aircraft", 25 Journal of Air Law and Commerce, 1958. Belgium is a country where the Rome Convention applies equally to domestic flights.

conformity with existing air traffic regulations.[219] Consequently, compensation is denied for damage caused by noise generated by aircraft in flight, provided that the aircraft is operated according to air traffic regulations. The owner of real property must tolerate airplanes overflying his land and no action in respect of trespass or nuisance may be taken as far as the pilot complies with the air traffic regulations.[220] Once the passage is allowed any noise resulting therefrom cannot be objected to and no action can be brought. Although this rule has met serious objections, it appears to be in harmony with most of the national legislations.[221]

The problem is created when unusual or unexpected damage beyond the normal interference occurs. Some courts have ruled that where owners creat the circumstances from which the unusual consequences originate, they must bear the loss themselves. On the other hand, when damage is caused due to unusual operation of the aircraft, then compensation must be paid.[222]

Looking back in the preparatory meetings of the Rome Convention, it may be said that most of the delegations believed that damage caused purely

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[219] Article 1 para. 1 of the 1952 Rome Convention reads:

> "Any person who suffers damage on the surface shall, upon proof only that the damage was caused by an aircraft in flight or by any person or thing falling therefrom, be entitled to compensation as provided by this Convention. Nevertheless there shall be no right to compensation if the damage is not a direct consequence of the incident giving rise thereto, or if the damage results from the mere fact of passage of the aircraft through the airspace in conformity with existing air traffic regulations".

[220] Shawcross and Beaumont, On Air Law, 3rd Edition, Butterworth, London, 1966.

[221] Rinck Gerd, "Damage caused by Foreign Aircraft to Third Parties", Journal of Air Law and Commerce, Vol. 28, 405, 1961-62.

[222] Id. at p. 408.

by the noise of an aircraft in flight can be compensated under the absolute liability regime of the Convention.[223] On the other hand, a British proposal referring to "normal" noise was rejected and one might conclude that the conference intended rather, to deny compensation even for unusual noise. The truth is that the Convention is rather obscure on two points: (1) on unusual noise originating from an otherwise normal passage, and (2) on the accumulated noise in the vicinity of airports, especially in the waiting areas.[224]

With respect to the first point, it should be noted that when the Convention was signed in 1952 it could not be anticipated that sonic boom would be a potential danger. Any damage, therefore, caused by sonic boom falls outside the privilege granted in Article 1.[225] Consequently, the operator will be liable under the broad principle of the same Article. With respect to the second point, the wording of the Convention and the intention of the Rome Conference indicate that there should be no compensation for damages resulting from concentrated noise in the vicinity of an airport.[226] The legal implications flowing from noise emitted from an airport and its waiting areas could stand outside the realm of the Convention and be subjected to national legislation.

The question of liability for damage caused by noise and sonic boom was raised in a meeting of the sub-committee of the legal committee of ICAO,

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[223] The proposal brought by a delegation, that only damage caused by physical contact by the aircraft should be covered by the Rome Convention, was rejected. See Mankiewicz note.

[224] See Rinck note 221, at 408.

[225] For the text of Article 1 see note 219.

[226] See Rinck note 221, at p. 409.

which studied the Rome Convention, held in Montreal from 2 to 12 April, 1973. According to the report of the sub-committee, presented to the 21st Session of the ICAO Legal Committee, 3-22 October 1974, the delegations viewed the problem of aircraft noise as one of paramount importance.[227] The report emphasized the need for interpretation of Article 1(1) of the Convention, which would make clear whether the damage envisaged therein covered both noise and vibrations of sonic boom or whether it was confined to the actual physical impact of an object falling from an aircraft or impact of the aircraft itself.

The Legal Committee of ICAO, in its 21st Session, while discussing the subject of the Revision of the Rome Convention decided to establish a Sub-Committee to prepare a text or alternative texts on the amendment of the 1952 Convention and another text or alternative texts of an instrument on liability for damage caused by noise and sonic boom.[228]

The Sub-Committee met in Montreal from April 8 to 23, 1975 and deemed the Rome Convention inappropriate for amendment to include noise and sonic boom.[229] The reasons were threefold. Firstly, the Convention at that time had been ratified only by 27 states, which indicated lack of support due to low limits of liability and the apparent ambiguity of its text. Secondly, Chapter III of the Convention was considered cumbersome and the single

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[227] ICAO Doc. 9131 - LC/173-2 p. 274. Also ICAO Doc. LC/SC Rome - NSB WB/1, February 19, 1975.

[228] ICAO Doc. 9122 LC/172, Part III.

[229] ICAO Doc. LC/SC Rome NSB WD/1, 8-23 April 1975, ICAO Report.

forum provisions of Article 20[230] do not allow jurisdiction in the state of the registration of the aircraft. Thirdly, the Convention in the form. It was at that time was of limited utility because some states had already adequate domestic legislation dealing with the substance of the Rome Convention.[231]

With respect to the mandate of the Legal Committee to the Sub-Committee to prepare a text or alternative texts of a totally new instrument on damage caused by noise and sonic boom, the Sub-Committee considered many proposals and drafts presented by some delegations.[232] The Sub-Committee though did not come out with any concrete results and failed to produce any acceptable text.[233] It concluded that the delegations favoured the view that claimants should be compensated for damage due to noise caused by aircraft operated in violation of air traffic regulations or by sonic boom, but no agreement was reached with respect to the appropriate mechanism which should be employed to achieve these results.[234]

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[230] See Chapter IV (Rules of Procedure and Limitation of Actions), Article 20 of the Convention.

[231] ICAO Doc. 9122 LC/172 Part III.

[232] IATA Report on ICAO Legal Sub-Committee on the Rome Convention - Noise and Sonic Boom, Ref. 3423-A, May 6, 1975.

[233] For the atmosphere in ICAO at that time and the position of developed and developing countries with respect to the aircraft noise problem in the vicinity of airports, see ICAO Doc. 9133, CAN/4, Committee on Aircraft Noise, Fourth Meeting, Montreal, 27 January - 14 February, 1975. See also page 31.

[234] ICAO Doc. LC/SC Rome NSB WD/1, 8-23 April, 1975, ICAO Report, p. 17

4.2 The U.S. Litigation on Aircraft Noise

At the national level, litigation in the courts of the United States related to noise in the vicinity of airports has far exceeded that of any other country. Many lawsuits have been filed against major public airports by neighboring property owners. The ideal solution for property owners would be for the courts to issue an injunction and have the aircraft operations cease. Being realistic, however, the annoyed community realizes that an injunction is not a practical solution to the problem, and so resorts to legal actions based on theories, such as inverse condemnation, trespass and nuisance.[235]

4.2.1 Injunctions

The United States Courts agree that airport neighbors who are subjected to excessive aircraft noise should have a legal remedy but that the proper remedy is not an injunction preventing airport operations. The underlying rationale the decisions is that the general social need for public airport operations is a paramount interest.[236]

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[235] Bennett Ricarda L., "Airport Noise Litigation: Case Law Review", 47 Journal of Air Law and Commerce, 1982.

[236] Harper Donald V., "Regulation of Aircraft Noise of Major Airports: Past, Present, and Future", 17 Transportation Law Journal, 1988. An exception to this rule is the early case Swetland v. Curtiss Airports Corp. (41 F.2d 929, N.D. Ohio 1930) in which the plaintiff was successful in stopping the construction of a privately owned airport near Cleveland.

4.2.2 Trespass Theory

The legal theory of trespass is defined as "transgression or offense which damage another person's... property."[237] The debate over trespass, when related to aircraft noise, has often revolved around the proximity of the aircraft to the land in question. State Courts have found that aircraft noise is the relevant consideration rather than the location of the aircraft over the land.[238]

In 1906, Lord Coke imported into the English common law the maxim "cujus est solum ejus est usque ad coelum" which means that a landowner owned all of the airspace from the heavens to the depths of the earth.[239] However, in 1946, the United States Supreme Court addressed the issue of how much airspace a landowner does own in United States v. Causby.[240] In this case, the court dealt with an action by a landowner whose property was directly below the take off and landing glide paths of military aircraft. Although the planes never touched the surface of the plaintiff's ground, they did pass as low as 67 feet above the property owner's have which caused him considerable anxiety. Moreover, the noise had vibrations frightened Causby's chickens and disrupted his poultry business.[241] The court recognized that

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[237] Black's Law Dictionary, revised 5th edition, 1979.

[238] Alevizos v. Metropolitan Airports Commission, 216 N.W. ed 651 (Minn. 1974).

[239] Lesser Joseph, "The Aircraft Noise Problem: Federal Power but Local Liability", 3 Urban Lawyer, 1971. See also the case sited in the same article Butler v. Frontier Telephone Co., 186 N.Y. 486, 491 (1906).

[240] 328 U.S. 256 (1946).

[241] Id.

Congress had placed the navigable airspace within the public domain,[242] but found that these flights were not within the navigable airspace. The Court stated:

> Superadjacent airspace is so close to the land that continuous invasions of it affect the use of the surface of the land itself. We think that the landowner, as an incident to his ownership, has a claim to it and that invasions of it are in the same category as invasions on the surface.[243]

Many years later, in the 1977 decision of Re Ramsey,[244] the appellate court affirmed the trial court's decision, which had concluded that the proper cause of action was trespass.[245] The court held that when airplanes stray from their established glide paths and fly directly over the plaintiff's property, an action lies in trespass and not in inverse condemnation.[246]

4.2.3 Inverse Condemnation

The most successful legal approach to the problem of aircraft noise has been that based on the theory of inverse condemnation or constitutional taking. Inverse Condemnation can be defined as a cause of action against a

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[242] The Air Commerce Act of 1926, 44 Stat. 568, 49 U.S.C. para. 171, as amended by the Civil Aeronautics Act of 1938, 52 Stat. 973, 49 U.S.C. para's 401, 176(a), 180.

[243] Causby v. United States, 328 U.S. at 265.

[244] 31 Pa. Comm. 375, A. 2d (1977).

[245] Id. at 866-67.

[246] Id. at 889.

government agency to recover the value of property taken by the agency though no formal exercise of the power of eminent domain has been completed.[247]

With respect to aircraft noise, the theory involves the use of the airspace in such a manner that noise levels generated by aircraft cause land values to decrease. Where the governmental entity fails to follow the approved legal procedures for acquiring the private property, or at least an avigation easement with respect to it, the landowner usually takes legal action against the public entity to recover the value of the property right that has been forfeited. Landowners usually claim that this taking violates either the fourteenth or the fifty Amendment of the U.S. Constitution or similar provision in State constitutions.[248]

In Griggs v. Allegheny County,[249] the court had to consider the question whether the county had taken an air easement over Griggs' property for which it should pay just compensation. Griggs' home was 3,250 feet from the end of a runway at Greater Pittsburgh Airport which is owned by Allegheny County. Planes were passing as low as 30 feet above Griggs' residence and it was extremely difficult for people in the house to talk or sleep; windows in the house rattled and plaster fell from the walls and ceilings.[250] The Supreme Court in rendering its decision stated:

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[247] Black's Law Dictionary, 5th edition, 1979, p. 740.

[248] U.S. Constitution amend's V and XIV. See also California Constitution art. 1 para. 14, Washington Constitution art. 1 para. 16, amend. 9 as cited in Bennett Ricarda L., "Airport Noise Litigation: Case Law Review", 47 Journal of Air Law and Commerce, 1982.

[249] 369 U.S. 84 (1962).

[250] Id.

> Following the decision in the Causby case, Congress redefined "navigable airspace" to mean "airspace above the minimum altitudes of flights prescribed by regulations issued under this chapter, and shall include airspace needed to insure safety in take-off and landing of aircraft...". By the present regulations the "minimum safe altitudes" within the meaning of the statute are defined, so far as relevant here, as heights of 500 or 1,000 feet, except where necessary for take-off or landing.[251]

The Court held that the airspace above Griggs' house was necessary for take-off and landing, and that the interference with his property amounted to an unconstitutional "taking" of an air easement. The case also established that neither the airlines nor the United States are liable but that liability rests with the local airport proprietor.[252]

However, in the case of Batten v. United States,[253] the lower federal court introduced a new restriction on inverse condemnation actions. In this case, the plaintiff complained of noise and vibrations from military jet operations. The noise occurred not from direct overflights but from engines running during pre-flight check procedures. The plaintiffs argued that in Causby, recovery had been allowed for vertical sound and shock waves, and that they should be allowed a like recovery for lateral waves. The court held that a physical trespass on or above the plaintiff's property was a requirement of a "taking" and added that recovery should uniformly be denied unless there

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[251] Id. at 88.

[252] In Justice Black's opinion, the United States and not Allegheny county should have been required to pay the just compensation because airport operations are conducted "under the direct signal and supervisory control of some federal agent". 369 U.S. at 93.

[253] 306 F. 2d 580 (10th Cir. 1962).

is direct overflight.[254]

The U.S. federal courts generally follow the Batten line of reasoning, but state court decisions have deviated from the federal trend by allowing recovery to landowner both under and near the flight paths. In Thornburg v. Port of Portland[255] and Martin v. Port of Seattle,[256] the courts relying on the Batten dissent rejected the line of federal cases that required direct overflights.[257]

In Alevizos v. Metropolitan Airports Commission of Minneapolis and St. Paul (MAC),[258] the Minnesota court, following the Thornburg-Martin line of reasoning, stressed that the most important factor is whether substantial interferences with property result from aircraft in flight. The court refused to make the "rather insignificant distinction" between direct and indirect overflights.[259]

In sum, we could say that the general rule is that condemnation can only

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[254] The Court also distinguished Causby and Griggs from Batten. Judge Murrah dissented stating that "the interference shown here was sufficiently substantial, direct and peculiar to impose a servitude on the Plaintiff's homes quite as effectively as the overflights in Causby and Griggs." 306 F 2d at 587 (1962).

[255] 233 or 178, 376 P.2d 100 (1962).

[256] 64 Wash. 2d 309, 391 P.2d 540 (1964).

[257] The Martin court reasoned its rejection by saying:

> We are unable to accept the premise that recovery for interference with the use of land should depend upon anything as irrelevant as whether the wing tip of the aircraft passes through some fraction of an inch of the airspace directly above the plaintiff's land. 391 P. 22 at 545.

[258] Minn. 471, 216 N.W. 2d 651 (1974).

[259] Id. at 659. See also Bennett Ricarda L., "Airport Noise Litigation: Case Law Review", 47 Journal of Air Law and Commerce, 1982.

lie where a taking can be established, and the test of damages awarded in inverse condemnation is still the reduction of fair market value of the property.[260]

4.2.4 The Nuisance Approach

Another tort theory that has become more accepted in the last few years, is the theory of nuisance according to which a property owner may seek relief for a substantial interference with the use and enjoyment of his or her property.[261]

Initially, some jurisdictions held that federal preemption prevented recovery from a nuisance actio, in so far as emissions from airplanes were concerned.[262] Courts have also refrained from granting injunctive relief under a nuisance theory, because this would have amounted to imposing the type of local regulation prohibited by the Supreme Court in Burbank.[263] Plaintiffs have also been denied injunctive relief on the basis that the rights of property owners are deemed to be outweighed by the public interest. In the

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[260] Id. at P.477. On the same issue see also Aaron v. City of Los Angeles, 40 Cal. App. 3d, 115 Cal. Reporter, 162 (Cal. Ct. App. 1975) and Adams v. County of Dade, 335 So. ed 594 (Fla. Dist. Ct. App. 1976).

[261] Bennett Ricarda L. note at 479. Also Black's Law Dictionary (5th ed. 1979): "Nuisance arises from a disturbance of one in possession of his property that renders use of such property uncomfortable".

[262] See Virginians for Dulles v. Volpe, 541 F.2d 442 (4th Cir. 1976) and also San Diego Unified Port District v. Superior Court, 67 Cal. App. 3d 361, 136 Cal. Reporter 557 (Cal. Ct. App. 1977).

[263] See chapter 3 para. 3.1.2. Local Noise Control Regulation.

case Loma Portal Civil Club v. American Airlines, Inc.,[264] the Supreme Court of California considered a suit brought by owners of property near a public airport seeking to enjoin commercial airlines from certain flight operations. The court denied injunctive relief stating: "It is well established that public policy denies an injunction... where private property has been put to a public use by a public service corporation and the public interest has intervened."[265]

Some cases though, show that the scope of an airport proprietor's liability under a nuisance theory has been broadened. In Nestle v. City of Santa Monica,[266] the Supreme Court of California rejected the view that the California Tort Claims Act clearly indicates an intent to immunize governmental entities from nuisance liability. The court held that damages for personal injury could be covered in a nuisance action.[267] Some years later in Great Westchester Homeowners Association v. City of Los Angeles,[268] homeowners were successful in their nuisance action against the municipal airport proprietor, in claiming emotional and mental distress caused by excessive noise, smoke and vibrations emanating from jet aircraft using Los Angeles International Airport. The trial court found that the Plaintiffs had

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[264] 61 Cal. 2d 582, 394 P.2d 548 (1964).

[265] Id. at 552. See also in Virginians for Dulles v. Volpe decision where the Court said: "Burdensome as it may be, Plaintiffs must submit to the great annoyance in the public interest...". 344 F. Sup. at 579 (E.D. Va. 1972).

[266] 6 Cal. 3d 920, 496 P.2d 480, 101 Cal. Rptr. 568 (1972).

[267] The court, though, found that with respect to property damages the inverse condemnation and nuisance causes of action merge. Id at note 15. See also Werlich John M. and Krinksy Richard P., "Recent Developments in Aircraft Noise Law", Committee on Airport Law, The Urban Lawyer, Vol. 18, No. 4 (Fall, 1986).

[268] 26 Cal. 3d 86, 603 P.2d 1939, 160 Cal Rptr, 733 (1979), cert. denied, 449 U.S. 820 (1980).

established the existence of an actionable nuisance which would justify damages and recovery independent of Plaintiff's claims for diminution of their property based on an inverse condemnation theory. In the same case, the court ruled that federal regulations and laws do not shield the airport proprietor from tort damage liability and approved an award of $86,000.[269]

In the more recent case of Baker v. Burbank-Glendale-Pasadena Airport Authority,[270] the court was asked to consider the question whether a nuisance resulting from airport noise was continuing of permanent in nature. This distinction is important because if the nuisance was permanent, residents would be permitted to bring only one lawsuit for past and prospective damages, and the appropriate statute of limitations would apply. On the other hand, if the nuisance was continuing in nature, then residents could bring a succession of lawsuits seeking recovery for damages for a given period of time. One of the most important factors to consider in determining this question is whether the nuisance can be abated. Although the Supreme Court understood that aircraft noise could not be totally abated, it concluded that the Plaintiffs had a right to choose whether to treat the nuisance as permanent or continuing.[271] The legal implication of this decision is that, in California, the same person is able to bring a succession of lawsuits seeking property and personal injury damages

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[269] 26 Cal. 3d at 88, 603 P.2d at 1331, 160 Cal. Rptr. at 734.

[270] 39 Cal. 3d 862, 705 P.2d 866, 218 Cal. Rptr. 293 (1985), cert. denied, 106 S. Ct. 1200 (1986). An analysis of this case is made in the article of Kirk Lisa, "Baker v. Burbank-Glendale-Pasadena Airport Authority: The California approach to Inverse Condemnation and Nuisance", 17 Pacific Law Journal, 1986.

[271] Id. The court assured airport operators that the statute of limitations would not bar nuisance actions, because the noise and vibrations were treated as a continuing nuisance.

throughout the time the person resides in the vicinity of an airport.[272]

A review of the United States litigation relating to airport noise: from the earlier cases that required direct aircraft overflights, to ones that allowed adjacent flybys to the Batten ruling that allowed plaintiffs to choose whether to treat a nuisance as permanent or continuing, makes one to realize that airport proprietors have more than a casual concern with their increasing susceptibility to liability.

4.3 Litigation Relating to Aircraft Noise in Other Countries

Although there has not been the same volume of cases as in the American jurisprudence, the matter has come before courts of other countries for consideration.

In England, Section 40(1) of the Civil Aviation Act, 1949, reads:

> No action shall lie in respect of trespass or in respect of nuisance, by reason only of the flight of an aircraft over any property at a height above the ground, which, having regard to wind, weather and all the circumstances of the case is reasonable, or the ordinary incidents of such flights so long as the provisions of (the Act and any Order made under the Act) are duly complied with.

The section was introduced to exclude the possibility of a right of action arising by the entry of an aircraft in flight, into the airspace above property. Although it is not clear in common law whether such an entry could amount to trespass,

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[272] See Werlich J.M. and Krinsky R.P. note 267, at 866.

the section has the effect of denying any claim for nuisance caused by the noise of aircraft flying overhead, landing, or taking-off.[273] However, the section does not apply to aircraft flying below a reasonable height, to aerial acrobatics and displays, and as in other areas of nuisance it would not apply in case of malice.[274] In Newman v. Conair Aviation, Ltd.[275] the plaintiffs complained of the aerial spraying of insecticide which drifted on to their land and of the noise of low-flying aircraft which frightened the plaintiffs and their horse. The court held that the spaying company and the farmer of land being sprayed were equally liable in nuisance.

Section 40(2) provides that an owner is liable without proof of negligence, or intention, or other cause of action where material loss or damage is caused to any person or property by, or by a person in, or an article or person falling from, an aircraft while in flight taking-off or landing. This provision encompasses loss or damage caused by noise or vibration, which in turn includes loss of life and personal injury.[276] A problem may arise with respect to the term "material". There are no cases on point, and therefore, it is not clear whether it means "measurable in money terms" or "physical". If the term "material" was interpreted in its strict sense, it would result in a situation that where damage was not material there would have to be proof of negligence, or intention, or other cause of action. Therefore, it is reasonably

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[273] This argument is caught by the words in the circumstances of the case. Halsbury's Law of England, 4th ed., 1974, Vol. 2, par. 1418.

[274] Id. and Christie v. Darey, [1893] 1 Ch. 316.

[275] [1973] 1 W.W.R. 316.

[276] See The Civil Aviation Act of 1949, Section 63(3).

assumed[277] that all damages mentioned in Section 40(2) should be recoverable without proof of negligence, unless negligence or contribution to the loss or damage can be shown on the part of the victim. It is clear, though, that where the injury does not involve the use or enjoyment of land so as to constitute a nuisance, the proof of negligence is necessary.[278]

Sections 40(1) and 40(2) are a compromise introduced by the English legislature, in an effort to balance the interests of the aircraft owners and the interests of the public on the ground.

In Canada, we have only a handful of cases dealing with noise created by aeronautical activities. In Lacroix v. The Queen,[279] the Exchequer court had to deal with a claim against the Crown where the plaintiff alleged, inter alia, recovery for an expropriation of an easement on his and adjoining properties for a lighting system which created a flightway over his land and which aircraft would use to land and take-off at Montreal (Quebec) Dorval Airport. The plaintiff also argued that the Crown is liable to him in damages because it interfered with his right of ownership which includes the surface and what is below and above his land thereby interfering with the enjoyment of his property. Despite the provision in section 414 of the Civil Code of Quebec which states that "the owner of the soil is also the owner of what is above and what is below"[280] the court denied the plaintiff recovery for the alleged taking of an easement over his property. Fournier, J. of the Exchequer Court

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[277] Halsbury's Laws of England, 4th ed., 1974, Vol. 2, para. 1419.

[278] Id.

[279] [1954] Ex. C.R. 69, [1954] 4 D.L.R. 470, (1955) 72 C.R.T.C. 89.

[280] The court noted that the application of this maxim has been restricted and it is not given literal effect any more.

concluded:

> ... I need go only so far as to say that the owner of land is not and cannot be the owner of the unlimited air space over his land, because air and space fall in the category of res omnium communis. For these reasons the suppliant's claim for damages by reason of so-called establishment of a flightway over his land fails.[281]

In 1964, Robert Shepherd brought a suit[282] against the Crown for damages because of the airport's operation,[283] and because of the registration of a servitude over his property. The Exchequer Court rejected his claim with respect to airports operations but allowed him damages by reason of the servitude for depreciation of the value of his property and for trees felled on his property.[284]

The Supreme Court of Nova Scotia in Nova Mink Farms v. Trans-Canada Airlines[285] had to consider a case where a rancher claimed damages for negligence because of aircraft noise which caused losses to his mink business. The court dismissed the claim because it found that the pilot was not aware of the existence and location of the farm, and that the situation did not present a "foreseeable risk of contact" nor did it suggest "a probability of

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[281] See note... at 96 (C.R.T.C.)

[282] [1964] Ex. C.R. 274.

[283] Airport's operations encompass low flying jet aircraft, noise, gasoline odors, glaring runway lights, risk hazards.

[284] The court approved the Lacroix decision and further stated that the construction of the airport (Dorval Airport) "is a perfectly normal enterprise, offending against no law, and therefore its activities are governed by appropriately attuned rules of objective responsibility, the law of torts." [1964] Ex. C.R. 274 at 280, 281.

[285] [1951] 2 D.L.R. 241 (N.S.S.C.).

harm... as to give rise to a duty of care" to avoid to fly an aircraft in its vicinity.[286]

The Norwegian jurisprudence shows that liability arising from noise damage has been established at take-off or landing, and during overflight. Where the cases involved aircraft noise during take off and landing, the airport authority has always been the defendant. Most of the cases dealt with aircraft noise generated by aircraft overlying fox and mink farms, causing the animals to whelp too early or to kill their brood. In these cases, the aircraft operator has been held responsible.[287]

In France, the Supreme Court did not accept to hear a complaint of a building proprietor who put up a building in the vicinity of an airport, with full knowledge that it would be subjected to aircraft noise.[288] In 1971, the Paris Court of Appeals held Pan American World Airlines and Air France liable for problems caused by noise in twelve communities around Orly Airport.[289]

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[286] Id. at 264.

[287] ICAO Legal Committee, 22nd Session, LC/Working Draft No. 854-2, 1976 at pp. 16-18.

[288] Société ERVE v. Air France, Cour de Cassation, 2nd Civil Chamber, May 9th, 1968.

[289] Wall Street Journal, July 7th, 1971 (untitled article). For liability issues in civil law jurisdictions see also Mankiewicz R.H., "Some Aspects of Civil Law Regarding Nuisance and Damage Caused by Aircraft", 25 Journal of Air Law and Commerce, 1958.

5. PROPOSED SOLUTIONS TO REDUCE AIRCRAFT NOISE

Proposals have been made to resolve the problem of aircraft noise by legal means at national and international level. The suggested, and in some countries already implemented, regulations take into account the existing aeronautical facilities, economic parameters and technical feasibility. Governments and international community in their effort to tackle the airport noise problem and relieve airport neighbors have introduced regulations dealing with: noise reduction technology, noise-abatement flight procedures, restrictions on airport use and noise-reduction techniques at point of reception.

5.1 Noise Reduction Technology

The simplest solution in terms of least disruption of existing ways of doing things would seem to be to make the aircraft quieter by somehow muffling the noise generated by the jet engines. This would mean with respect to aircraft still to be built that they would be equipped with quieter engines. With respect to aircraft already in use would mean they would be retrofitted by acoustic treatment of the engine nacelles, by nacelle redesign, by engine modification, or they would be reengined with quieter engines. Research has shown that retrofitting can significantly reduce noise on landing (a reduction of 10 to 15 EPNdB) whereas noise during take-off is much more difficult to

abate (a reduction of 3 EPNdB).[290]

Although it seems that this solution can eliminate the airport problem overnight, this is not the case. Retrofitting or replacing old aircraft with new ones is a process which requires substantive expenses. A study conducted in 1971 found that the capital cost of retrofitting could range at that time from $200,000 to $1,000,000 per aircraft and the operating cost would increase by four to nine percent.[291] Moreover, the industry is not always able to provide the airlines with the needed technology. The problem was obvious in the United States, where airlines had difficulties in obtaining hush-kits on time to meet the deadlines introduced by the FAA in 1976.[292]

Regulations of this kind, concerning engine noise emission, are not sufficient to significantly reduce the annoyance suffered by airport neighbors because:

(1) already existing aircraft have a life span of 25 years and it is not economically advantageous to withdraw these aircraft from service before that time.[293] Consequently rules for retrofit are more likely to apply to new types of aircraft.

(2) The steady increase of air traffic is negating the noise reduction achieved by retrofitting older types of aircraft.[294]

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[290] "Civil Aviation Research and Development Policy: Supporting Papers", Study, Department of Transportation - NASA, Washington, 1971.

[291] Id. and "Transportation noise and noise from Equipment Powered and Internal Combustion Engines", U.S. Environmental Protection Agency, Washington, 1971.

[292] 41 Fed. Reg. 56,045-46 (1976) (codified in 14 C.F.R. para. 91.301. See also para. 3.1.1 Federal Regulation.

[293] See the ICAO discussions on this subject in part 2.

[294] "Airports and the Environment", Organization for Economic Co-operation and Development, Paris, 1975.

In view of the difficulties that arise, and the costs required, it is clear that widespread retrofitting would be necessary to reduce reduce noise levels, without creating any economic disadvantage for some airlines with respect to their competitors. Before such measures are adopted, a cost/effectiveness analysis should be carried cut covering all existing aircraft to see whether the costs of general retrofitting could be compensated by substantially decreased annoyance both in terms of time and space. Retrofitting assessment must include all existing aircraft to be meaningful; it is clear by now that if only one country is analyzed retrofitting would prove far too costly and in any case would give partially ineffective results.[295]

5.2 Noise-Abatement Flight Procedures

Certain noise-abatement procedures can be followed to reduce aircraft noise during take-off and landing. In doing so, consideration must be given to safety which becomes paramount during these two critical points of aircraft flight.

5.2.1 During Take-off

The area affected by take-off is bigger than that affected by noise during landing. This explains why restrictions on night operations are stricter for take-offs than for landing.

One method that is already in use at many airports calls for thrust

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[295] Id. at 31.

reduction after reaching a safe altitude, in an effort to reduce engine noise. This means that an aircraft is taking off under full power and climbing at the steepest possible angle in order to gain height before flying over densely populated areas, and then reducing power at an altitude of some 300 metres in order to keep the noise level as low as possible while overflying these areas. The effectiveness of this method depends upon the population distribution in the areas surrounding the airport, and therefore, a turn immediately after take-off is needed whenever a flight path can be used above a sparsely populated area.[296]

Another method includes the preferential use of certain runways (when whether conditions permit), and an effort to concentrate all take-offs in a small number of strictly defined flight corridors. Provided that take-offs are concentrated rather than spread out, fewer people are in fact inconvenienced. The truth is that people leaving under these paths suffer greater annoyance, since the noise occurs more frequently.[297] This method nevertheless has an important advantage for land-use planners because the noise can be limited to a well-defined area. This means that any sound-proofing and planning schemes involve a smaller area than if the noise were spread around the airport.

This solution can be an effective one if the aircraft follows the paths exactly, and only if the flight paths are fixed by the authorities concerned in a manner that takes into account geographical and meteorological factors of a certain airport.

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[296] "Airports and the Environment", Organization for Economic Co-operation and development, Paris, 1975. See also Parlicek, M.J., "O'Hare International Airport: Impervious to Proposed State Efforts to Limit Airport Noise", 47 Journal of Air Law and Commerce, 1982.

[297] Id. OECD, p. 31.

5.2.2 During Landing

Many modified procedures have been tried in order to mitigate noise during the landing phase. The most successful have been two, namely the two segment approach and the one that the aircraft uses minimum flap configuration.

The two segment approach calls for an initial descent slope of six degrees, with a change to a final slope of three degrees, rather than a conventional one segment three degree approach. This method has two advantages over the conventional approach: (a) The thrust level is less because the initial six degree descent increases speed through gravitational pull than engine thrust and (b) the aircraft is higher in the air for a longer period of time when over noise sensitive areas.[298] This procedure, though, involves safety problems and pilots have complaint where such measures are imposed. The benefits from noise reduction perspective, appear to be small if the two-segment approach is to be safely applied, because: (1) not all airplanes can fly a six degree upper segment because of weight, flap drag and energy considerations; as a result, the noise-reduction benefits would be small if the procedure is not followed by all airplanes; (2) most airplanes would have to apply full flaps, thus increasing noise from aerodynamic drag, in order to keep the descent rate and engine speed within the prescribed limits required by safety considerations; and (3) weather conditions sometimes do not allow this

[298] Pavlicek M.J., at p. 441.

kind of approach (side winds etc.).[299]

Another method is the one that calls for minimum flap configuration which still preserves engines speed needed for maneurerability. According to this technique, the flaps are left at the aircraft's certified minimum setting and are not changed after the plane descends to 500 feet.[300]

5.3 Restrictions on Airport Use

Apart from the technical methods of reducing noise, regulatory measures can be taken on a purely local basis, although these often have repercussions at national or international level. These measures include establishment of noise limits at certain airports, closing the airport at certain times, sharing traffic between several airports and changes in location or operation of ground run-up areas.

5.3.1 Noise Limits

Limitations based upon noise emission characteristics of aircraft require the airport's managing authority to deny use of the airport to planes which do not meet certain noise standards.[301] The implementation of such regulations

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[299] Id. and Harper, D.V., "Regulation of Aircraft Noise at Major Airports: Past, Present and Future", Transportation Law Journal, Vol. 17, 1988.

[300] This procedure is followed with success by O'Hare airport since 1972. Pavlicek, M.J., at p. 442.

[301] Such regulations are implemented by the authorities of Kennedy Airport in New York (112 PNdB limitation) and London-Heathrow Airport. In the second case, the limit for night is much stricter than for daytime (102 and 110 PNdB respectively).

by an airport authority will not have a negative impact on national and international air transport only if airline fleets are acoustically treated through retrofitting or replacement of existing aircraft. The difficulties of the retrofit approach are mentioned in the beginning of this chapter (para.5.1.).

5.3.2 Closing the Airport at Certain Times

Limitations on times when noisy aircraft may use the airport, and limitations on airport operating hours are designed to promote a ban on some or all night-time operations. There are now many airports where night traffic is forbidden: all those in Switzerland, many in Germany, Paris Orly, Gopenhagen and London Heathrow in Summer.[302] The time of shutdown varies from airport to airport between four to seven hours.

A limitation on the hours of airport operation would most logically occur, as can be seen from the above examples, as a curfew banning operations during the night when the fewest operations are scheduled and the probability of sleep disturbance is the highest. Although curfews affect air passenger operations, they have their greatest impact upon air cargo operations, because the majority of all-cargo operations occur during evening times. Consequently, overnight delivery of documents, medicines, and other items in immediate demand are jeopardized.[303]

Shutting down airports at night also entrails serious economic and

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[302] See OECD at page 33.

[303] See Pavlicek, M.J., at p. 431.

practical disadvantages. There is a loss of income for the airports that impose curfews because air-fright companies prefer to use airports where there are no restrictions on night operations, once it is easier for them to move the cargo in the airport area at night time. Furthermore, problems arise from the time difference at different points of the world. If a night curfew is imposed, there are difficulties in arranging take-off schedules for long-distance flights in order to overcome the time difference obstacle.[304]

Despite these shortcomings, total or partial bans of night movements would be necessary for airports located in highly urbanised areas, where the noise problem more acute than other areas.

5.3.3 Sharing Traffic Between Several Airports

When a city is served by at least two airports, airport operations may be so distributed as to subject the least number of people to noise whenever possible.

A good example of this practice is Bromma Stockholm airport which is the closest one to the city, and jet aircraft are barred from operating there. Jet aircraft are required to use the facilities of Arlanda airport forty kilometres from the city.

This solution is not always viable as a noise abatement procedure. This was clear when it was considered as an alternative to reduce noise at O'Hare International Airport (Chicago, Illinois). In that case, it was found that to

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[304] Problems arise even with respect to flights within the United States because of the time difference between the coasts.

bring O'Hare within the proposed noise limitations would require a drastic reduction in operations at the airport.[305] Shifting flights from O'Hare to Midway of Rockford airports was not considered a good choice for reducing the overall noise impact in the state of Illinois. It was also found that because of the fact that noise levels are logarithmic calculations, rather than arithmetic ones, a large percentage of flights should have been eliminated or shifted to abate airport noise a comparatively small amount.[306] As a result, flight shifting at that instance was considered as an ineffective noise abatement procedure.

This practice, though, of sharing traffic with other airports would offer a solution where new airports are under construction or planned. These airports in most cases are located in sparsely populated areas, and usually complement existing facilities located in some populated area. It would be possible to share traffic between these two kinds of airports, for example, by transferring all night flights or noisy airport operations to the new sites.[307]

5.3.4 Changes in Location or Operation of Ground Run-Up Areas

For testing the working order of an airplane engine, it must be started and accelerated while on the ground. This process, commonly called "run-up", produces engine noise which further adds to the airport noise problems.

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[305] See Pavlicek, M.J., "O'Hare International Airport. Impervious to Proposed State Efforts to Limit Airport Noise", 47 Journal of Air Law and Commerce, 1982.

[306] Id.

[307] OECD, 1975, p. 33.

Run-ups ideally should be done with the fewest number of engi. es and noise should be directed at the least populated area or into a noise absorbent structure. The amount of abatement is determined by the fleet composition. The fact that most types of planes cannot run-up with fewer than all engines operating simultaneously, does not help the case very much.

From a practical point of view, changing run-up areas is not difficult to accomplish, but banning nighttime run-ups would delay maintenance and affect flight schedules. Although ground run-ups are small part of the airport noise problem, their control in combination with other noise abatement measures would contribute to the solution of the problem.

5.4 Noise-Reduction Techniques at Point of Reception

Apart from the above mentioned possible ways of regulating aircraft noise at its source, some other measures have been considered: those designed to provide protection against noise at its point of reception. While the measures already described are the primary concern of aircraft manufacturers, airlines and airports, those we are going to talk about now are to be considered by authorities competent for urban planning, land-use planning and construction.

5.4.1 Control of Land Use

A solution is to move or keep people away from the airport and the

noise. For existing airports, this means either zoning of unused land areas to prevent residential and other noise-sensitive uses or purchase of land already occupied by noise-sensitive users and turning the land over to non-sensitive use.

Since the Second World War, urbanization around major airports has gone out of hand and there has been demand of building land, even in the noisiest areas, while at the same time, air traffic was rapidly growing and jet aircraft were being introduced. Around such airports only partial remedies are possible, such as purchase of the most exposed dwellings, overflying charges to provide financial compensation, restrictions on further urban expansion. An alternative that airport operators have is to purchase the occupied noise-sensitive land adjacent to the airport and convert it to one of non-sensitive use. A solution of this kind, though, would require a great amount of money because usually the value of land adjacent to airports is quite high, and thus the solution becomes not very attractive.[308]

Despite the difficulties that arise with respect to already existing airports, land-use control can be an important and sometimes vital solution at new major airports. Careful consideration must be given, while selecting a site for a new airport, to design the airport to minimize the noise problem, to locate the airport where land around is not yet developed and to provide the airport authority or any competent authority with control over land use around airport. Land acquisition by the airport operator is very helpful for effective land-use planning.[309]

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[308] Harper, D.V. "Regulation of Aircraft Noise at Major Airports: Past, Present, and Future", Transportation Law Journal, Vol. 17, 1988.

[309] An extensive land-use planning programme has been carried out "at the site of the Montreal International Airport (Mirabel), where the Canadian government, in March 1969, initiated the largest public land banking programme over undertaken

5.4.2 Soundproofing of Dwellings

The noise insulation of dwellings, schools, hospitals and other buildings where noise abatement is necessary is a partial solution rather than a cure because people must keep their windows closed in order to avoid noise, and the environment itself remains unchanged. In areas, though, where the noise problem is acute (especially around existing airports) noise insulation is often the only way to reduce the inconvenience in a short time. The methods used are usually: double glazing, better fitting outer doors, mechanical or electrical air-conditioning.

In this point, we should mention one particularly interesting achievement: from 1966 to 1975, four thousand dwellings located around Heathrow Airport - London were soundproofed, through the Noise Insulation Grant Schemes.[310] Following the provisions of these schemes a government grant was paid to residents upon request, for soundproofing their dwellings.

The amount which is required for soundproofing varies according to the degree of noise reduction sought, the number of rooms to be treated, the size of the windows and so on. The decision whether the cost of soundproofing

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in association with the development of a major airport facility. The federal government expropriated 88,000 acres, to the north-west of the City of Montreal, only 18,000 of which were planned to be used for the actual airport facilities. The remaining 70,000 acres were acquired to assure the control and development of all land potentially exposed to airport operations." (The expropriation is proved to be excessive for the needs of land-use control in the vicinity of Mirabel Airport). See McNairn, C.H., "Airport Noise Pollution: The Problem and the Regulatory Response", The Canadian Bar Review, Vol. L, 1972.

[310] For more information about the English approach, see Kerse, C.S., The Law Relating to Noise, Oyez Publishing, London, 1975.

should be borne by tenants and owners or whether partial or total government grants should be instead considered, is a political one and must be taken by governments.

With regard to new buildings, the granting of building permits in the vicinity of airports, can be subject to some minimum amount of soundproofing, varying according to the impact that noise has on the dwellings.[311]

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[311] OECD, 1975, p. 36.

6. CONCLUSION AND FINAL REMARKS.

Airport noise pollution is one of the pervasive problems facing the aviation community today. Its adverse effects on human psychological and physiological health, in addition to its detrimental impact on the human environment is today well documented : it is a problem that can no longer be ignored.

Much has been done at the national and international levels to control aircraft noise in the areas surrounding major airports. There is Annex 16 on Environmental Protection which classifies aircraft according to their noise emission levels and sets standards and recommended practices for aircraft operating in airport areas. In addition, many countries have implemented supplemental national legislation, sometimes introducing even stricter standards, as is evidenced by the approach of the United States. In spite of these efforts, ever increasing litigation in various countries shows that the proposed, and in some cases already implemented, measures have been inadequate in curbing noise levels.

Much of the problem lies in balancing the interests of the air transport industry in expanding aviation operations, with the interests of neighbouring airport communities in preserving their own well-being. Cutting across this

distinction is the fact that developing countries, struggling against great financial burdens have been unable or unwilling to comply with the ICAO regulatory standards. The problem is international in nature and cannot be solved through the unilateral actions of individual states. Nor can specific isolated measures be expected to bring about long term change or eliminate the problem.

This October, ICAO member states will have a new opportunity to discuss the issue of airport noise pollution during the 28th (extraordinary) Session of the Assembly in Cairo. Their effort must be one of cooperation and compromise, directed toward the adoption of uniform measures which can be globally adhered to.

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-Code de L'Aviation Civile, Decret No. 55-1590, Decret No. 55-1590 (1955), Loi No. 53-515, (1963)

-Federal Aviation Act, 49 U.S.C., 1958

-Federal Aviation Noise Abatement Act, Pub. L. No.90-411, 82 Stat. 395, (U.S. 1968)

-Federal Aviation Regulations, Part 36 - Noise Standards. Aircraft Type Certification, 14 CFR, (U.S. 1977)

-Noise Standards for Newly Produced Airplanes of Older Type Design, 38 Fed. Reg. 29, 569 (U.S., 1973)

APPENDIX A

DRAFT ASSEMBLY RESOLUTION

Resolution A28/

Possible operating restrictions on subsonic jet aircraft which exceed the noise levels in Volume I, Chapter 3 of Annex 16

Whereas certification standards for subsonic jet aircraft noise levels are specified in Volume I, Chapter 2 and Chapter 3 of Annex 16,

Whereas environmental problems due to aircraft noise continue to exist in the neighbourhood of many international airports;

Whereas some States are consequently considering restrictions on the operations of aircraft which exceed the noise levels in Volume I, Chapter 3 of Annex 16,

Recognizing that the noise standards in Annex 16 were not intended to introduce operating restrictions on aircraft,

Recognizing that operating restrictions on existing aircraft would increase the costs of the airlines of many countries and would impose an economic burden on those airlines which do not have the financial resources to re-equip their fleets, and

Considering that resolution of problems due to aircraft noise must be based on the mutual recognition of the difficulties encountered by States and a balance among their different concerns,

The Assembly

1. Urges States not to introduce any new operating restrictions on aircraft which exceed the noise levels in Volume I, Chapter 3 of Annex 16 before considering:

a) whether the normal attrition of existing fleets of such aircraft will provide the necessary protection of noise climates around their airports,

b) whether the necessary protection can be achieved by regulations preventing their operators from adding such aircraft to their fleets through either purchase, or lease/charter/interchange, or alternatively by incentives to accelerate fleet modernisation;

c) whether the necessary protection can be achieved through restrictions limited to airports and runways the use of which has been identified and declared by them as generating noise problems and limited to time periods when greater noise disturbance is caused;

d) the implications of any restrictions for other States concerned, consulting these States and giving them reasonable notice of intention;

2. Urges States which, despite the considerations in Resolving Clause 1 above, decide to introduce restrictions on the operations of aircraft which comply with the noise certification standards in Volume I, Chapter 2 of Annex 16 but which exceed the noise levels in Volume I, Chapter 3 of Annex 16:

a) to frame any restrictions so that Chapter 2 compliant aircraft of an individual operator which are presently operating to their territories may be withdrawn from these operations gradually over a period of not less than [duration to be determined by the Council and the Assembly] in an evenly distributed manner and in such a way that the last aircraft is not required to be withdrawn until the end of the period,

b) not to begin the above phase-in period for any restrictions before [date to be determined by the Council and the Assembly];

c) not to restrict before the end of the phase-in period the operations of any aircraft less than 25 years after the date of issue of its first individual certificate of airworthiness,

d) not to restrict before the end of the phase-in period the operations of any presently existing wide-body aircraft,

e) to apply any restrictions consistently with the non-discrimination principle in Article 15 of the Chicago Convention so as to give foreign operators as least as favourable treatment as their own operators at the same airports;

f) to inform ICAO, as well as the other States concerned, of all restrictions imposed,

3. Strongly encourages States to continue to co-operate bilaterally, regionally and inter-regionally with a view to alleviating the noise burden on communities around airports without imposing severe economic hardship on aircraft operators,

4. Urges States, if and when any new noise certification standards are introduced which are more stringent than those in Volume I, Chapter 3 of Annex 16, to recognize the desirability of not imposing any operating restrictions on Chapter 3 compliant aircraft before completion of their full operating life,

5. Urges States to develop an integrated approach to the problem of aircraft noise, including land-use planning procedures around international airports, so that land-use incompatible with aircraft noise is minimal,

6. Further urges States to assist aircraft operators in their efforts to accelerate fleet modernization; and

7. Declares that the present resolution supersedes Resolution A26-11 and, in respect of noise aspects, Resolution A23-10.

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APPENDIX B

ESTIMATED NUMBER OF CHAPTER 2 AIRCRAFT SUBJECT TO PHASING-IN OF OPERATING RESTRICTIONS COMMENCING AT DIFFERENT DATES

I. Chapter 2 Aircraft Registered in "Noise-Restricted Areas"[1]

Aircraft remaining in service in absence of an operating ban	31 Dec 1988[2]	31 Dec 1994	31 Dec 1995	31 Dec. 1996	31 Dec. 1997	31 Dec. 1998	31 Dec. 1999	31 Dec. 2000	31 Dec. 2001	31 Dec. 2002	31 Dec. 2003	31 Dec. 2004	31 Dec. 2005
Narrow-body	3 292	2 264	2 157	2 040	1 920	1 792	1 653	1 523	1 392	1 267	1 148	1 038	1 033
Wide-body	201	136	125	115	105	95	86	79	70	63	57	54	52
Total	3 493	2 400	2 282	2 155	2 025	1 887	1 739	1 602	1 462	1 330	1 205	1 092	1 085
Aged over 25 years													
Narrow-body	-	609	609	591	568	570	569	575	563	558	577	598	610
Wide-body	-	3	37	54	59	59	59	58	52	51	49	47	46
Total	-	612	646	645	627	629	628	583	615	609	626	645	656

II. Chapter 2 Aircraft Registered in "Non-Restricted Areas" and Operating to "Noise-Restricted Areas" (after all possible redeployment to other routes)*

Aircraft remaining in service in absence of an operating ban	31 Dec 1988[2]	31 Dec. 1994	31 Dec 1995	31 Dec. 1996	31 Dec. 1997	31 Dec. 1998	31 Dec. 1999	31 Dec. 2000	31 Dec. 2001	31 Dec. 2002	31 Dec. 2003	31 Dec. 2004	31 Dec. 2005
Narrow-body	285	219	188	176	165	154	142	129	117	105	95	86	79
Wide-body	56	45	43	40	38	36	34	30	27	25	22	20	18
Total	341	264	231	216	203	190	176	159	144	130	117	106	97
Aged over 25 years													
Narrow-body	-	42	43	44	42	49	52	59	53	55	53	51	61
Wide-body	-	-	2	8	8	12	12	13	12	12	14	13	13
Total	-	42	45	52	50	61	64	72	65	67	67	64	74

1/ Assumed "noise-restricted areas" (see Circular 218) are geographical areas covering ECAC member States, Australia, Japan, New Zealand, United States. Other geographical areas are assumed "non-restricted areas".

2/ For comparative purposes, the total commercial jet fleet at 31 December 1988 (excluding Soviet-built aircraft used solely in U.S.S.R. domestic operations) is estimated as follows:

Noise-restricted areas 5 996 (3 493 Chapter 2, 2 503 Chapter 3).
*Non-restricted areas 2 341 (395 non-noise certificated, 1 367 Chapter 2 of which about half operated to the "noise-restricted areas", 579 Chapter 3).

All non-noise certificated aircraft are expected to be retired before 1995.

*Note for Council: Numbers are in the process of updating for inclusion in finalized Assembly Working Paper.