THE LAW RELATING TO SATELLITE NAVIGATION AND AIR TRAFFIC MANAGEMENT SYSTEMS – A VIEW FROM THE SOUTH PACIFIC

Kim Murray[*]

This article is an updated and revised version of a paper originally presented to a Communication, Navigation, Surveillance/ Air Traffic Management Forum of Pacific state, airline and air traffic service provider organisation representatives meeting in Sydney, Australia on 16 April 1998. The Forum was organised under the auspices of the Australian Branch of the Royal Aeronautical Society.

I INTRODUCTION

In 1992, the 28th session of the International Civil Aviation Organisation (ICAO) Legal Committee arrived at the modest but important conclusion that there was no legal obstacle to the implementation and achievement of the Communication, Navigation, Surveillance/Air Traffic Management (CNS/ATM) systems concept and nor was that concept inconsistent with the Chicago Convention.[1] Although there were many unanswered questions about the applicable law, the main concern at that stage was that the law should not impede technological progress. That progress has been rapid and the Global Navigation Satellite Systems (GNSS) and satellite-based Air Traffic Management (ATM) systems are now operating in several parts of the world. The Air Traffic Service (ATS) providers of Australia and New Zealand and the international airlines of both countries have been acknowledged leaders in successfully implementing the new systems. The geography of the Pacific with its long trans-oceanic routes no doubt provided the

* LLB (Auck); LLM (Lond); Dip Air and Space Law; Barrister, Wellington, New Zealand. The author records his gratitude to Steven Blair, Senior ICAO Liaison Officer at the Civil Aviation Authority of New Zealand for providing many of the ICAO documents required in order to prepare this article.

1 Report of the 28th session of the ICAO Legal Committee, ICAO Doc 9630-LC189.

necessary incentives for this to occur. It is not surprising at the present stage of development however that many of those involved with the new systems are now pausing to inquire about their rights to enjoy the benefits, the cost of doing so, their responsibilities for ensuring that nothing goes wrong, and their potential liability if something does go wrong.

This is where the law becomes relevant. It is humankind's social tool for establishing a degree of certainty in a complex world and an orderly means of restoring the equilibrium if something unexpected occurs - such as an aircraft or satellite accident.

The more participants there are in any human endeavour the more potential there is for difficulties to arise. There is also potential for greater legal complexity as any difficulties will normally be transmitted through the chain of legal relationships that exist. The principal participants in the GNSS and satellite ATM systems at present are:

(1) the two primary signal provider states (the USA and Russian Federation);

(2) the air traffic service providers (which these days are likely to be commercial entities);

(3) the users of the service, mainly airlines (passengers and cargo shippers could be regarded as the end users);

(4) states as the principal subjects of international law which are also responsible for the safety regulatory function;

(5) ICAO as an international standard setting and co-ordinating organisation (together with other relevant international organisations such as the International Telecommunications Union and the International Maritime Satellite Organisation).

These are only the principal participants. There may be several others, including space-based and ground-based signal augmentation providers and not least the manufacturers of all the equipment, including computer software, involved.

While the number of participants can produce legal complexity there are two other features of the systems which make the subject matter particularly challenging from a legal perspective. These are: the multi-faceted nature of the subject, and the fact that the components that make up the total system are located in all three main spatial areas known to international law. The satellites are in outer space; the aircraft under air traffic management are in atmospheric space (frequently over the high seas); and the ATS providers are located on the ground in one or more states. Therefore it is not only flight crew who must at all times maintain situational awareness. Lawyers also need to be clear about the legal status of the spatial area in which the particular activity they are concerned

with is occurring. This is important if they are to have any prospect of accurately advising their clients about GNSS and the new CNS/ATM issues.

The issues have to be addressed both in terms of international law (including the specialised fields of air law, space law and telecommunications law) and the domestic law of the states involved. The existence of domestic law of course is an attribute of statehood and it is states which are the principal subjects of international law and with which, like it or not, we are principally concerned. As Judge Max Huber said in the *Palmas Arbitration*:[2]

> Territorial sovereignty is, in general, a situation recognised and delimited in space, either by so called natural frontiers as recognised by international law or outward signs of delimitation that are undisputed, or else by legal engagements entered into between interested neighbours, such as frontier conventions, or by acts of recognition of states within fixed boundaries…it serves to divide between nations the space upon which human activities are employed, in order to assure them at all points the minimum of protection of which international law is the guardian.

International law therefore divides the world spatially and, depending upon the nature of the legal issue we are addressing, we may also be referred to the domestic law of one or more states.[3]

It appears that from a technical point of view the present satellite navigation and ATM systems are not so much revolutionary as evolutionary (the so-called marriage of satellite technology with computers). This is also true from a legal point of view. In the early days of space exploration for instance it was sometimes suggested that humankind was entering some kind of legal vacuum. This was incorrect because established concepts of international law such as state sovereignty, nationality and jurisdiction automatically applied to humankind's activities in space. So it is with satellite navigation and ATM systems. Technological development has not been occurring in a legal vacuum. On the contrary there is much pre-existing law to be aware of and new law will evolve. Indeed as a matter of legal technique it is always wise to carefully ascertain what the existing legal situation is (lex lata) before new law (lex ferenda) is proposed. Both these dimensions of law have been occupying many hours of earnest deliberations over recent years in many ICAO forums. In this article I endeavour to provide an overview of the current law and the principles being formulated for a possible new future legal framework. I should probably start at the top.

---

2 *Palmas Arbitration* (1928) 2 United Nations Reports of International Arbitral Awards 289, 839.

3 See B Cheng "The Legal Regime of Airspace and Outer Space. The Boundary Problem Functionalism Versus Spatialism: The Major Premises" (1980) 5 Annals of Air and Space Law 323.

II INTERNATIONAL SPACE LAW

According to general (customary) international law, the Global Positioning System (GPS) and Global Orbiting Satellite Navigation System (GLONASS), satellite constellations of the United States and Russian Federation respectively, are located in a spatial area which cannot be appropriated by any state. The satellites have a right to be in space, like ships on the high seas. But general international space law has been rapidly overtaken by treaty law. Two treaties are particularly relevant to the GNSS and the new CNS/ATM systems. They are the 1967 Outer Space Treaty[4] and the 1972 Liability Convention.[5] Both treaties are in force and have been very widely ratified by states, including the main space launching states and many Pacific states. Significantly, in response to increased commercial aerospace activity, Australia has recently enacted the Space Activities Act 1998 to make many of the provisions of the space treaties applicable in Australian law.

The 1967 Outer Space Treaty contains some important general obligations relating to outer space. For instance, the exploration and use of outer space shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all humankind.[6] Also, in the exploration and use of outer space the parties to the Treaty shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space with due regard to the corresponding interests of all other parties to the Treaty.[7] The Treaty confirms the general international law position that outer space is not subject to national appropriation by claims of sovereignty, by means of use or occupation, or by any other means.[8] Parties to the Treaty must carry on activities in the exploration and use of outer space in accordance with international law, including the Charter of the United Nations, in the interests of maintaining international peace and security and promoting international co-operation and understanding.[9]

---

4 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 27 January 1967, 610 UNTS 205 entered into force on 10 October 1967.

5 Convention on International Liability for Damage Caused by Space Objects, 29 March 1972, 961 UNTS 187.

6 Article 1 of the 1967 Outer Space Treaty.

7 Article 9 of the 1967 Outer Space Treaty.

8 Article 2 of the 1967 Outer Space Treaty.

9 Article 3 of the 1967 Outer Space Treaty.

It is worth remembering too that state parties to the Outer Space Treaty bear international responsibility for their national activities in outer space.[10] Launching states and states from whose territory satellites are launched are internationally liable for damage caused to other Treaty parties or their citizens whether the damage is caused on Earth, in airspace, or in outerspace.[11] Many provisions of the Outer Space Treaty could now be said to have developed into rules of general international law and therefore could be invoked by and against states which are not parties to the Treaty.

The 1972 Liability Convention is much more prescriptive. It establishes an onerous liability regime for satellite launching states. The heart of this regime is that -"[a] launching state shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight".[12]

If damage is caused by one state's space object to another state's space object other than on the surface of the earth, then liability is not absolute but depends on fault. In the case of collisions between satellites, both of the launching states involved can be held jointly and severally liable to third states and their citizens.[13] Individuals can claim only through states but, very significantly, presentation of claims against a launching state does not require the prior exhaustion of domestic law remedies.[14] This is unusual in international law. However domestic law claims and Liability Convention claims cannot both be pursued in respect of the same damage. And if the claim is made under the Convention there is a one year period for claims to be made from the time the damage occurs, or becomes known, or from when the launching state is able to be identified.[15] There is also a procedure for states to require a Claims Commission to be established.[16] International intergovernmental organisations which conduct space activities can also become parties to the Liability Convention if a majority of the member states of the international organisation are also parties to the Outer Space Treaty and the Liability Convention.[17]

I have only referred briefly to the 1967 Outer Space Treaty and the 1972 Liability Convention in order to show that it is pre-existing law which forms the backdrop to the

---

10 Article 6 of the 1967 Outer Space Treaty.

11 Article 7 of the 1967 Outer Space Treaty.

12 Article II of the 1972 Liability Convention.

13 Article IV of the 1972 Liability Convention.

14 Article XI of the 1972 Liability Convention.

15 Article X of the 1972 Liability Convention.

16 Article XIV of the 1972 Liability Convention.

17 Article XII of the 1972 Liability Convention.

agreements by the United States and Russian Federation to make their respective military satellite systems available for world wide aeronautical use free of charge. This generosity would seem to be entirely consistent with many of the general obligations of the space powers in the Outer Space Treaty, which I have already referred to. It would be churlish to suggest one gets what one pays for because there is no doubt that aviation users are receiving much more than they pay for. But it is also fair to say there are still many unresolved technical and legal questions about this situation. For instance, the agreements I refer to are not agreements with the user states or their ATS providers. Rather, both agreements are only in the form of exchanges of letters between United States and Russian Federation Ministers or officials on the one hand and the President of ICAO on the other.[18] The legal efficacy of this situation is not reassuring. Nevertheless both the United States and the Russian Federation have undertaken to ensure the availability of reliable satellite signals on a non-discriminatory basis for periods of 10 and 15 years (respectively). I believe we are entitled to read the agreements together with the subsisting treaty obligations of both states which I have summarised above.

It is recognised that these are transitional arrangements. It is open to states to negotiate additional safeguards if they can but this seems to be unrealistic and would produce a multiplicity of *ad hoc* bilateral arrangements. Looking to the near future it seems likely that a multilateral convention will be required to regulate the legal situation between primary and secondary signal provider states and international organisations on the one hand and signal user states and international organisations on the other. It would seem to be highly desirable for this to occur before the disestablishment of the existing ground-based navigation aids which is planned for early in the new millennium.

III INTERNATIONAL AIR LAW

We move now from the field of international space law to international air law. In making the transition into the Earth's atmosphere it must immediately be acknowledged

---

18 See attachments to ICAO State Letters LE 4/49.1 – 94/89 dated 13 December 1994 in the case of the USA offer and LE 4/49.1 – 96/80 dated 20 September 1996 in the case of the Russian offer. The operative part of the United States letter to the President of the ICAO Council dated 1 October 1994 provides:

> [T]he United States intends subject to the availability of funds as required by United States law, to make the Standard Positioning Service of GPS available for the foreseeable future, on a continuous, worldwide basis and free of direct user fees. This service…will be available…on a nondiscriminatory basis to all users of civil aviation, will provide horizontal accuracies of 100 metres (95 per cent probability) and 300 metres (99.99 per cent probability). The United States shall take all necessary measures to maintain the integrity and reliability of the service and expects that it will be able to provide at least 6 years notice prior to termination of GPS operations or elimination of GPS-SPS.

that there is a possible gap in the law. At the present stage in the development of international law there is still no precise legal boundary between outer space and airspace. This situation does not seem to have caused difficulties so far. This is because states have adopted the pragmatic view that if an object can remain in earth orbit, it is in outer space whereas if it derives lift from the reaction of the air on its surfaces, it is in airspace. There is some consensus that a horizontal boundary at the 100 kilometre altitude would be appropriate but one can say no more than that.[19]

Speaking of airspace then – there is a fundamental distinction to be drawn between international airspace (mainly the airspace over the high seas) and national airspace. According to general international law and Article 87 of the 1982 Convention on the Law of the Sea there is freedom for the aircraft of all states to fly over the high seas. It is also a rule of general international law that every state has complete and exclusive sovereignty over the airspace above its territory. This is confirmed in Article 1 of the Chicago Convention. A state's territory includes its maritime territory. When considering the law applicable to the various aspects of satellite navigation and ATM it is absolutely essential to distinguish between and reconcile these two different legal regimes.

It seems unlikely that the distinguished delegates who drafted the Chicago Convention in 1944 had in mind the present space-based navigation and ATM systems. However, the brilliance of their work is evidenced by the fact that there is much in the Chicago Convention that already applies to the new technology, or can easily be made to apply because of the Convention's highly successful law-making procedures. I will mention a few provisions of the Chicago Convention of particular relevance to CNS/ATM.

A Rules of the Air

For a start let us look at the Rules of the Air. As the new technology delivers so called "flexible tracks" and "free flight" there may need to be new rules for flight over the high seas. Article 12 of the Convention states that over the high seas, the rules in force shall be those established under the Convention. Those rules are set out in Annex 2. Annex 2 is king of the Annexes because unlike the other Annexes states are not permitted to file differences to the Rules of the Air. States can and should however participate in the making of new Annex provisions through ICAO's rule-making procedures.

1 User charges

Article 15 of the Chicago Convention on user charges will also be of fundamental importance to the airline users of the new systems. If there are any states which have ambitions to expand their Flight Information Regions (FIRs) and ATM capability for

---

19 See Cheng, above n 3.

revenue generating purposes they will need to consider carefully their obligations under Article 15. In summary these obligations are:

(1) every airport in a contracting state which is open to public use by its national aircraft shall also be open under uniform conditions to the aircraft of all the other contracting states;

(2) these uniform conditions shall apply to the use, by aircraft of every contracting state, of all air navigation facilities, including radio and meteorological services, which may be provided for public use for the safety and expedition of air navigation;

(3) any charges that may be imposed or permitted to be imposed by a contracting state for the use of airports and air navigation facilities shall not be discriminatory as between its national aircraft and other aircraft involved in similar operations;

(4) all charges shall be published and communicated to ICAO, and other states may request the ICAO Council to review such charges;

(5) no fees, dues or other charges shall be imposed by any contracting state in respect solely of the rights of transit over or entry into or exit from its territory of any aircraft of a contracting state or persons or property thereon.

It has therefore been said by one legal commentator on Article 15 that:[20]

> Broadly speaking, it is difficult to overstate the apparent anti-discriminatory scope and significance of Article 15 for modern commercial civil aviation, both as a guarantor of equal access to public facilities and as the embodiment of the drafters' intention that charges be fair, just and equally applied to aircraft involved in similar operations.

It is fortunate that Article 15 is legally robust because I expect it will be sorely tested when some or all the costs of the satellite technology employed for aeronautical use are sought to be passed on to the airlines through commercial ATM provider organisations.

B Infrastructure Obligations

Another question that may be occupying the time of some governments, particularly those in the developing countries, is what obligations do they have to implement the new technology? Fortunately the Chicago Convention is flexible in this regard. It recognises the various stages of economic development of the state parties to the Convention. The obligation is set out in Article 28 which, in relevant part, says:

---

20 Edwin O Bailey "Article 15 of the Chicago Convention and The Duty of States to Avoid Discriminatory User Charges: The US-UK London Heathrow User Charges Arbitration" (1994) 19 Annals of Air and Space Law 81, 82.

> Each contracting state undertakes, so far as it may find practicable, to:
>
> Provide, in its territory, airports, radio services, meteorological services and other air navigation facilities to facilitate international air navigation, in accordance with the standards and practices recommended or established from time to time, pursuant to this Convention;
>
> Adopt and put into operation the appropriate standard systems of communications procedure, codes, markings, signals, lighting and other operational practices and rules which may be recommended or established from time to time, pursuant to this Convention; …

Article 28 is actually highly significant concerning the infrastructure issues raised by the new ATM systems. Although its wording suggests the obligation applies to infrastructure in the state's territory, in practice Article 28 is the starting point for numerous Annex provisions which deal with infrastructure, not only for flight operations within the state's territory, but also for services provided outside a state's territory. The infrastructure obligation is limited by the words "so far as states may find practicable". However, to the extent that states can comply this is to be in accordance with the standards and recommended practices (SARPS) established under the Convention. This suggests that ICAO can, under the existing Chicago Convention provisions, promulgate safety standards for the new technologies. There is a jurisdictional issue so far as the space-based systems are concerned. However the space-based systems provide signals for aeronautical use and Article 37, which provides for the adoption of SARPS, is conveniently open-ended. After listing a number of subjects requiring adoption of SARPS, ICAO's competence is extended to making SARPS dealing with "…such other matters concerned with the safety, regularity and efficiency of air navigation as may from time to time be appropriate".

1 ICAO'S role

This brings me to the role of ICAO itself. There are those that consider ICAO should have moved faster and further than it has and others that are "minimalists" and would prefer to let commercial entities and market forces dictate the pace of development. But the Chicago Convention largely answers this debate because, as a matter of law, ICAO clearly has a central role in relation to both GNSS and satellite CNS/ATM systems. This is evidenced by Article 44. That article sets out the objectives of ICAO and because it is almost entirely apposite to our subject I set it out in full as follows:

> Objectives
>
> The aims and objectives of the Organisation are to develop the principles and techniques of international air navigation and to foster the planning and development of international air transport so as to:
>
> Insure the safe and orderly growth of international civil aviation throughout the world;

> Encourage the arts of aircraft design and operation for peaceful purposes;
>
> Encourage the development of airways, airports, and air navigation facilities for international civil aviation;
>
> Meet the needs of the peoples of the world for safe, regular, efficient and economical air transport;
>
> Prevent economic waste caused by unreasonable competition;
>
> Insure that the rights of contracting states are fully respected and that every contracting state has a fair opportunity to operate international airlines;
>
> Avoid discrimination between contracting states;
>
> Promote safety of flight in international air navigation;
>
> Promote generally the development of all aspects of international civil aeronautics.

Possibly because the Organisation has demonstrated that it is actively fulfilling these objectives most of the critics have by now deferred to ICAO's global co-ordinating role but are less sanguine about its regional role. There is a legitimate question here about whether the existing legal and institutional framework can cope with a pressing need for new regional arrangements. The current Regional Air Navigation Agreements and Plans, for instance, do not necessarily suit the ambitions of some states in the Pacific region, especially as their ATS provider organisations become increasingly satellite CNS/ATM capable. At this point a brief digression into the law that applies to regional arrangements seems appropriate.

2 *Regional arrangements*

The principle SARPS concerning ATM are contained in Annex 11 on Air Traffic Services, the latest edition of which is July 1997. That Annex deals with ATS in both national airspace and airspace over the high seas. When applying Annex 11 the geography of the particular region can be especially relevant. In relation to their national airspace states shall determine where ATS will be provided and then arrange for the services to be established and provided in accordance with Annex 11. The state can delegate this function to another state. For example, some Pacific states have delegated the management of their upper airspace to the Republic of Fiji. Those portions of the airspace over the high seas or in airspace of undetermined sovereignty where ATS will be provided shall be determined on the basis of Regional Air Navigation Agreements. A contracting state having accepted the responsibility to provide ATS in such portions of airspace shall thereafter arrange for the service to be established and provided in accordance with the provisions of Annex 11. The states concerned are required to designate the authority

responsible for actually providing the services, and this may be a state or a suitable agency, such as an intergovernmental organisation or a commercial entity.

The procedures for establishing detailed regional arrangements are set out in a series of appendices to ICAO Assembly Resolution A32-14 which is a "[c]onsolidated statement of continuing policies and associated practices related specifically to air navigation". These policies and practices provide for Regional Plans to be revised when they are no longer consistent with current and foreseen requirements of international civil aviation.[21] Regional Air Navigation Meetings convened by the ICAO Council are the principal means of conducting comprehensive reviews and revisions of Regional Plans as necessary to keep them abreast of changing requirements. Meetings of limited technical and/or geographical scope shall be convened in the case of specific problems requiring urgent solution.[22] The resolution also deals specifically with delineation of ATS airspace in Regional Air Navigation Plans.[23] In relation to such plans the Assembly specifically resolved:

> the boundaries of ATS airspaces, whether over states' territories or over the high seas, shall be established on the basis of technical and operational considerations with the aim of ensuring optimum efficiency and economy for both providers and users of the services;…

And Appendix N of the Resolution also makes it clear that:

> any Contracting State which delegates to another State the responsibility for providing air traffic services within airspace over its territory does so without derogation of its sovereignty.

The necessary legal and institutional machinery therefore already exists to embrace the new navigation and ATM systems. Pacific states should probably therefore be slow to attempt to create new legal regional arrangements if the ICAO system is not found wanting. However, it is necessary to emphasise an important distinction between the geographical division of airspace for ATM purposes and the arrangements for the actual provision of services in the airspace. The former can be dealt with by the ICAO system of Regional Air Navigation Plans and Agreements whereas the latter requires specific regional action.

In the Pacific region progress with both these aspects may soon require many states to relinquish their FIR responsibilities and also consider delegating management of their national upper airspace to other states in the region, or even conceivably to a single state

---

21 Appendix K of ICAO Assembly Resolution A32-14.

22 Appendix L of ICAO Assembly Resolution A32-14.

23 Appendix N of ICAO Assembly Resolution A32-14.

for the whole Pacific region. That state would assume responsibility for satellite CNS/ATM for a vast area of both national and international airspace that may encompass all the existing Pacific FIRs.[24] It is unlikely that the state itself would actually be involved in delivery of air traffic services; that would be left to a commercial ATS provider based in its territory and therefore subject to the state's safety regulatory jurisdiction. This situation would obviously require a high degree of confidence in the technical and legal efficacy of the new regional arrangements. Contingency plans will be necessary in case of natural disasters, industrial disruption or technical failures.[25]

As a second level of integration there could be joint financing agreements between the states concerned. The Denmark/Iceland Joint Financing Agreement for the provision of air navigation services in the North Atlantic is the precedent usually referred to in this regard and the Council of ICAO can have a significant role to play in such arrangements pursuant to Chapter XV, Articles 69-76 of the Chicago Convention if required. This perhaps should be regarded as an intermediate type of regional arrangement. A fully developed one would see the creation of a new intergovernmental organisation as the CNS/ATM service provider for the whole Pacific or Asia/Pacific region. More realistically such a new regional organisation would not itself be a service provider but instead it would be the legal institution established to take responsibility for the engagement of a commercial ATS provider.

On 4 May 1998, a Forum Aviation Policy Ministerial Meeting in Suva adopted an "Action Plan" in relation to upper airspace management in the Pacific. Essentially, agreement was reached between the Pacific Forum countries that the Pacific airspace would be managed cooperatively, efficiently and safely as unified airspace consistent with ICAO procedures. The member states also agreed to observe a moratorium on the acquisition of further CNS/ATM facilities until further work had been done.[26] The

---

24 But this would be without derogation of airspace sovereignty so far as the delegating states are concerned - see Appendix 11 Chapter 2.

25 Appendix N of ICAO Assembly Resolution A32-14 contains an "Associated practice" encouraging states providing ATS over the high seas to enter into agreements with other states to put contingency plans into effect with the approval of the ICAO Council until the original services are restored. In December 1995 the New Zealand CAA implemented a Contingency Plan in respect of the New Zealand FIR as a result of industrial disruption to air traffic services. The urgency of the situation meant that the Contingency Plan did not initially have the approval of the ICAO Council. On close legal analysis the jurisdiction of the ICAO Council to approve Contingency Plans or indeed Regional Air Navigation Agreements is by no means clear.

26 A South Pacific Forum Aviation Ministerial Meeting held in Nadi, Fiji from 13-15 September 1999 has rejected an elaborate proposal for a new regional provider organisation outlined in an IATA Consultant's report. A new steering committee of officials has been established to progress the Action Plan decisions on the Pacific airspace project.

elaboration of a new regional concept is beyond the scope of this article but suffice to conclude this section by saying that the rate of technological progress is starting to place pressure on the existing individual state approach to the provision of ATS. A brief comment on domestic law becomes relevant at this point.

IV DOMESTIC LAW

Traditionally government ministries within states have provided ATS for their own territory and for an area of airspace over the high seas as defined in Regional Air Navigation Plans. The government ministry has usually fulfilled the dual roles of providing the service and being its own safety regulator. In New Zealand in 1987 the ATS function was split out of the Ministry of Transport and established as a state-owned limited liability company called Airways Corporation of New Zealand Limited. After a short transitional period it became a fully commercial provider of air traffic services.[27] Then in 1992 the safety regulatory function was also split out of the Ministry of Transport with the creation of the Civil Aviation Authority.[28] The Ministry retained only policy-making and performance-monitoring functions. Australia has similar constitutional arrangements with Airservices Australia, the Civil Aviation Safety Authority and the Department of Transport. Fiji has also now established Airports Fiji Limited as an ATS provider separate from the Civil Aviation Authority of Fiji.

As noted in the introduction to this paper, the proliferation of new legal persons can be productive of legal complexity. Until now I have been dealing with the principles of public law but commercial ATS providers are mainly concerned with private law. For instance, the Airways Corporation of New Zealand contracts with its airline customers by way of a simple standard form contract. When the airlines file their flight plans and request ATS after prior notification to them of that standard term contract they are deemed in law to have accepted the standard terms and conditions including the applicable schedule of charges.[29] What happens then if the service is not provided, or not provided to an adequate standard, or worse still is causative of a mid-air collision? The answer is that private law and in particular contract law will govern in the first instance.

---

27 Airways dues received by the Government under the Civil Aviation (Charges) Regulations 1965 were initially transferred to the Corporation. On 1 July 1988 the Corporation instituted its standard term contract for the provision of airways services and the Corporation was no longer able to rely upon statutory or regulatory assistance for its revenue.

28 Civil Aviation Amendment Act 1992.

29 This situation was the subject of a test case: *Airways Corporation v Geyserland Airways* [1996] 1 NZLR 116. Although Airways was not successful in recovering the overdue airways charges in issue in that case the efficacy of its contractual charging system was upheld by the High Court.

Passengers or their dependants will look to the airline ticket, the applicable conditions of carriage and then seek to claim in the court of the country which is an available forum, having regard to the factual and legal circumstances involved. These plaintiffs will find that in most states the domestic law will say that the contract for international carriage by air was subject to the Warsaw Convention or the Warsaw Convention amended by the Hague Protocol and the air carrier will be presumed to be liable, but only up to a relatively low limit of damages in the absence of wilful misconduct. Fortunately as a result of the IATA Inter-carrier Agreement (IIA) adopted in Kuala Lumpur on 30 October 1995 most airlines around the world are now in the course of amending their standard conditions of carriage to waive the Warsaw and Warsaw/Hague Convention liability limits. This means that in the event of personal injury or death occurring during international carriage by air, the air carrier will be presumed liable for damages up to the amount of proved loss.[30] At this point one can see the beginning of a legal chain reaction.

The airline, or more realistically its insurers, will look for legal recourse against the commercial entity that provided the CNS/ATM service. This will involve suing for breach of contract or for breach of a common law duty of care in tort and in either case overcoming any exclusion or limitation of liability provisions in the ATS provider's contract. If the ATS provider is found liable its insurers will look for recourse against the manufacturer of any defective equipment involved, or the primary or secondary signal provider if there is a causative connection to the collision. If for some reason the ATS service provider is unable to claim against the signal provider state (because of a claim of sovereign or tort claims immunity for example) then the ATS service provider will need to persuade its government that a claim at the international level should be pursued against the signal provider state, or international organisation. At that level we have seen already that the legal basis for such claims exist under both the 1967 Outer Space Treaty and the more detailed claims procedures in the 1972 Convention on International Liability for Damage Caused by Space Objects.

---

30 The full background and details of the IIA and the associated IATA Measures of Implementation Agreement (MIA) are covered in a series of articles in The Aviation Quarterly [1996-97] TAQ 1-86. On 28 May 1999, a new convention was adopted in Montreal which is designed to update and consolidate the Warsaw liability regime (ICAO Doc DCW Doc No 57 28.05.99). If and when the Montreal Convention comes into force, after 30 states have agreed to be bound by it, it is expected the IATA intercarrier contractual liability arrangements will be superceded by the new treaty law as implemented in the domestic law of state parties.

This legal situation has been summarised by the President of the ICAO Council in the following terms:[31]

> From a private law perspective, there is a contractual relation between a service provider and a user. Non-performance by the former may constitute a breach of contract which gives rise to liability. In offering the GPS service, the US government has not addressed liability. However, according to the clarification of the US representative on the Council, this does not mean that the provider may not be held liable for negligent failure of the system: GPS is subject to the same liability provisions as other navigation aids provided by states and therefore needs no other clarification or interpretation. The Legal Bureau of ICAO has expressed an opinion along the same lines. Specifically, it has opined that should an accident occur because of an obstacle to the dependability of the signals, the relevant rules of liability will apply and the signal providers will be held responsible through recourse to the laws of the relevant state. A case involving failure would be settled through the courts, and if for some reason an entity cannot bring the case to court, the matter can be pursued through that entity's government.

Therefore, on the issue of liability there is no question of being in a legal vacuum. Almost certainly new and difficult legal issues will emerge however and this has provided the incentive for much of the work that is being done to progressively develop a new legal framework.

V THE LEGAL WORK IN ICAO

It is just as well that there is a substantial body of law that already applies to the new technology because progress with the legal issues in ICAO has not been spectacular to date.

The 29th session of the ICAO Legal Committee met in Montreal from 4 to 15 July 1994. Its main agenda item had the cumbersome title: "Consideration With Regard to Global Navigation Satellite Systems (GNSS), of the Establishment of a Legal Framework". It will be noticed immediately therefore that GNSS has been the focus for the legal work rather than the full panoply of CNS/ATM issues.[32]

---

31 Assad Kotaite "ICAO's Role with Respect to the Institutional Arrangements and Legal Framework of Global Navigation Satellite Systems (GNSS) Planning and Implementation" (1996) 21 Annals of Air and Space Law 195, 203. See also detailed article on GNSS liability issues by BDK Henaku "The International Liability of the GNSS Space Segment Provider" (1996) 21 Annals of Air and Space Law 143. More specifically in relation to United States law see Gregory E Michael "Legal Issues Including Liability Associated with the Acquisition, Use and Failure of SPS/GNSS" (1999) 52 Journal of Navigation.

32 See further M Milde "Solutions in Search of a Problem? Legal Problems of the GNSS" (1997) 22 Annals of Air and Space Law 195.

In any event the Legal Committee could not agree on much. Little progress was made apart from recommending the establishment of a committee of legal and technical experts.[33] The ICAO Council agreed with this recommendation and the Panel of Legal and Technical Experts on the Establishment of a Legal Framework With Regard to GNSS (LTEP) was established by the ICAO Council on 6 December 1995. The Panel was given a mandate to consider a suitable long term legal framework for GNSS.

The Panel, (which included representatives from Australia and New Zealand) first met in November 1996. It held a second and final meeting in October 1997 and presented its final report to the ICAO Council. A perusal of the Panel's Final Report indicates that, like the Legal Committee, its members did not find the subject matter easy going. It appears there was a degree of tension between those taking a public law, or state based, approach and those with a more private law and commercial perspective of what a new legal framework should look like. However the Panel was able to agree upon a Draft Charter on the Rights and Obligations of States Relating to GNSS Services.[34]

For the most part the Charter simply elaborates certain principles already stated by the ICAO Council in 1994 or already recognisable as existing law. One of the preambular sentences for instance says that "GNSS shall be compatible with international law, including the Chicago Convention, its Annexes and the relevant rules applicable to outer space activities". The draft charter recognises GNSS as an important element of the CNS/ATM systems and in summary, brings together the following principles:

(1) the safety of international civil aviation shall be the paramount principle;

(2) state access to the use of GNSS services on a non-discriminatory basis under uniform conditions;

(3) the authority of states in relation to the control of aircraft operations and the enforcement of safety regulations shall not be infringed;

(4) GNSS signal provider states shall ensure the continuity, availability, integrity, accuracy and reliability of such services in accordance with ICAO standards;

(5) states shall co-operate to secure the highest practical degree of uniformity and in particular "States shall ensure that regional or subregional arrangements are compatible with the principles and rules set out in this Charter and with the global planning and implementation process for GNSS."

---

33 Report of the Legal Committee 29th Session ICAO Doc 9630-LC/189. A summary of the Panel's work and of ICAO's legal deliberations is set out in a short article by Jiefang Huang of the ICAO Legal Bureau in (1997) 52 (8) ICAO Journal.

34 The Draft Charter is set out as Appendix 3 to the Panel's Final Report (LTEP/2, 3 November 1997).

(6) charges for GNSS shall be in accordance with Article 15 of the Chicago Convention;

(7) states shall be guided by the principle of co-operation and mutual assistance;

(8) GNSS activities shall be conducted with due regard for the interests of other states;

(9) nothing in the Charter shall prevent two or more states from jointly providing GNSS services.

The Panel could not agree on liability issues and therefore they are not mentioned in the Draft Charter, although the Panel did make recommendations about the topics requiring further study in relation to an appropriate legal regime. The plain fact of the matter is that states are wary of committing to any substantial work on elaborate new treaty or institutional provisions before they prove to be really necessary.

The preparation of the Draft Charter was timely however because it was available for consideration at the ICAO Worldwide CNS/ATM Systems Implementation Conference convened in Rio De Janeiro from 11 to 15 May 1998. The conference supported the adoption of the Draft Charter as an interim framework. There was disagreement about the nature of a long term legal framework but the predominant view was that an international convention was necessary to safeguard universal accessibility and continuity of the services and to deal with liability issues. It was recognised that implementation of a new system should not be delayed pending work on the legal issues. The Conference also endorsed the central role of ICAO in the implementation of a long term global GNSS system by developing technical and operational SARPS. Subsequent to the Rio Conference, the Draft Charter on the Rights and Obligations of States Relating to GNSS has been adopted in the form of an ICAO Assembly resolution as an interim measure.

For the future the challenge is to harmonise the global and regional work being done in order to make a full transition to satellite navigation and ATM systems by 2010. The law will play its part. It is reassuring that existing law and the law-making procedures available under the Chicago Convention will usually provide satisfactory answers to the legal questions now being asked. But the law does not stand still. At the global level the legal relationship between signal provider states and signal user states requires reasonably urgent attention. In the Asia/Pacific region many states could soon be called upon to relinquish all air traffic management in upper airspace to one or more providers in other states. If this cannot be quickly agreed to on sound technical and economic grounds a new

intergovernmental regional ATS provider organisation may be required.[35] The complex work involved should not be rushed, but neither should law reform fall too far back in the slipstream of technological progress.

LE DROIT APPLICABLE POUR LES GUIDAGES DE LA NAVIGATION AÉRIENNE PAR SATELLITES ET AU CONTRÔLE AÉRIEN: SA MISE EN ŒUVRE DANS LE PACIFIQUE SUD

Les règles relatives à la navigation et au contrôle aérien, notamment en matière de guidage dans les vols transocéaniques sont empreintes de complexité techniques et juridiques relevant tout à la fois du droit international aérien classique mais aussi du droit spatial international, ce qui n'est pas sans engendrer de difficultés.

Dans un proche avenir, les stations de guidage terrestres devraient progressivement faire place au guidage satellitaire. Or le recours à ce dernier système, bien que plus fiable et plus précis, implique aussi une perte de revenus substantiels pour les Etats sur le territoire desquels sont installés les stations de guidage.

L'auteur, s'intéressant plus particulièrement aux pays du Pacifique, dresse un état des lieux des règles applicables dans ce domaine, et suggère les reformes qu'il convient d'entreprendre pour concilier les intérêts des parties en présence.

Cet article représente la version complétée d'une communication présentée par l'auteur, lors du colloque organisé le 16 avril 1998 à Sydney, par la Communication Navigation Surveillance Air Traffic Management Forum of Pacific State, sous les auspices de la Australian Branch of the Royal Aeronautical Society.

35 This could be done in a manner that is entirely consistent with ICAO's global role as in the case of EUROCONTROL and other similar international regional organisations. See further *ICAO Manual of Air Navigation Services Economics* (3 ed, 1997) Doc 9161/3.