International Civil Aviation Organization

World-wide CNS/ATM Systems Implementation Conference
Rio de Janeiro, 11 15 May 1998

WW/IMP WP/74
11/5/98
ITEM 5

Agenda Item 5: Legal Aspects

INFORMATION—LEGAL IMPLICATIONS OF CNS/ATM

(Presented by the United States of America)

ACTION PAPER

SUMMARY

CNS/ATM is revolutionizing global air navigation, but it need not revolutionize international aviation law. Evolving legal and administrative mechanisms support CNS/ATM very well. Legal changes are likely to be incremental rather than fundamental. Indeed, ICAO has concerned itself little with the legal and institutional aspects of satellite-based surveillance and communications. As for GNSS, ICAO has found it to be fully consistent with the Chicago Convention and that there are no fundamental legal obstacles to its implementation. ICAO's Council, the Legal Committee, and a Panel of Legal and Technical Experts have exhaustively examined the issues without coming to a consensus that any major changes are needed. Meanwhile, implementation is continuing apace through technical efforts in ICAO and policy planning in member State governments and cooperation through global, regional, and bilateral mechanisms.

REFERENCES

Statement of ICAO Policy on CNS/ATM Systems Implementation and Operations (C 141/13) (9 March 1994)

Statement by the ICAO Council to Contracting States on Charges for Airports and Air Navigation Services (Doc 9082) (22 June 1992)

Draft Charter on the Rights and Obligations of States Relating to GNSS Services (contained in *Report of the Second Meeting of the Panel of Legal and Technical Experts on the Establishment of a Legal Framework with Regard to GNSS* (Montreal, 6 to 10 October 1997)

1. BACKGROUND

1.1 For well over a decade, ICAO has been engaged in building a transition to the air navigation system of the future. The communications, navigation, and surveillance (CNS) components of the next century's Air Traffic Management (ATM) system will all include satellite-based transmitters and receivers. The United States and the Russian Federation have offered use of their Global Positioning System (GPS) and GLONASS, respectively, as candidates for the initial space-segment signal-providing components of a Global Navigation Satellite Services (GNSS) system.

1.2 The United States has offered to provide GPS space-segment signals as a *component* of GNSS without charge to the world aviation community. Although the signals in space will be available to users world wide, the United States will provide *air navigation services* based on the use of GNSS only in the United States and in other airspace (e.g., oceanic airspace) where the United States currently provides such services. Preparations for the provision and authorization of full-scale GNSS is now going on across the globe in ICAO and in governments, international organizations, and the private sector. These preparations mainly take the form of experiments and trials using signals from the existing the GPS and GLONASS space segments, developing augmentations to those signals, and defining operational and certification procedures for the evolving system.

1.3 The civil aviation community has received the prospect of this transition with both enthusiasm and concern. The enthusiasm flows from the obvious benefits of accurate en route navigation anywhere in the world, both across oceans and over vast, remote land areas previously only scarcely served by navigation aids. CNS/ATM will increase both safety and traffic capacity in densely transited North Atlantic and North Pacific airspace. CNS/ATM also holds out the prospect of providing accurate, flexible, cost-effective instrument approaches to any airport in the world, including many places never before served by instrument approaches of any kind. These benefits, along with progress to date in the transition, are detailed in other papers.

1.4 Introduction of any dramatically new technology, however, is always accompanied by concerns. Governments and potential users of CNS/ATM are concerned about costs—both of operation and transition—and about control and reliability of the systems. They are also concerned about the fate of existing ground-based navaids. ICAO's air navigation bodies (including the FANS I and II committees) have dealt effectively with legal and institutional issues, from the technical standpoint. The Legal Committee, at the behest of the Council, has also considered some of the legal and institutional issues. Meanwhile, ICAO is implementing CNS/ATM, including GNSS.

2. DISCUSSION

2.1 Status of Legal and Institutional Issues in Icao

2.1.1 Thus far, the Council and the Legal Committee have concentrated their efforts on examination of legal and institutional aspects of Global Navigation Satellite Services. They have not considered any issues raised by the other two parts of the CNS trilogy, the communications and surveillance aspects of future air navigation systems, beyond endorsing their consistency with the Convention on International Civil Aviation (the Chicago Convention).

2.1.2 The Legal Committee began its work on GNSS by endorsing the recommendation of a distinguished *rapporteur*, Dr. Guldimann from Switzerland, who found no legal or institutional impediments to introduction of GNSS. A similar finding was made by the 29th Assembly, on recommendation of the Assembly's Legal Commission, which also found GNSS to be fully consistent with the Chicago Convention. At

every stage, the resolution was accompanied by a proviso that work on legal and institutional issues should in no case be permitted to delay the speedy implementation of GNSS.

2.1.3 Meanwhile, the item, "Consideration, with regard to global navigation satellite systems (GNSS), of the establishment of a legal framework," remains on the agenda of the Legal Committee. To further the Organization's work on legal aspects of GNSS, the Council created a Panel of Legal and Technical Experts on the Establishment of a Legal Framework with Regard to GNSS, known as LTEP, which has met three times. The Panel was charged with considering different types and forms of a long-term legal framework, including the possible need for a convention, and preparing draft texts for consideration by the Council. The LTEP has created a draft charter (a restatement, really) of rights and obligations having to do with GNSS and has made a number of other recommendations to be taken into account in further work on consideration of a legal framework for GNSS.

2.2 U.S. Views of Institutional and Legal Issues

2.2.1 Revolutionary or incremental?

2.2.1.1 GNSS is truly revolutionary in the quality of the positioning information it makes available to aircraft, and in the global reach of its signals. Its impact on civil aviation will be profound. In institutional and legal terms, however, it is important to understand that GNSS is only evolutionary in its impact. Aircraft have navigated in oceanic airspaces far from land for a long time, using a variety of fixing aids. Some of the aids have been internal to the aircraft, sensing magnetic flux, acceleration, barometric pressure, and so forth, and others have depended on signals propagated by ground-based antennas. Aircraft already rely every day on signals generated by navigation aids located outside the airspace of the State they are operating in, especially in Europe, Asia, and Latin America.

2.2.1.2 While the international community debates the need for and the timing and form of a long-term GNSS, the interim GNSS consists of several components, including satellite signals and, increasingly, augmenting signals from other (terrestrial or satellite) sources, where needed for a particular phase of flight. No one knows what long-term GNSS will look like, since no specific design has yet been proposed. GPS, as a component of the interim GNSS, can be used to satisfy the positioning requirements of some flight phases on its own (for example, in the oceanic environment, and to meet the Basic Area Navigation, or RNAV, requirements in Europe), and may require augmentations to satisfy other requirements (for example, approach and landing.) Nevertheless, even though both the geographical coverage and positional accuracy of GNSS signals are dramatically improved over existing over-water navaids, GNSS is not so different from them in legal and institutional terms.

2.2.2 Specific concerns

2.2.2.1 The nature of a framework. The Chicago Convention sets out the essential relationships of states with each other and with ICAO for global air traffic management. Standards and Recommended Practices (SARPs) are the institutional mechanism for making rules for the introduction of new technology. The Council has already issued important guidance on GNSS, and the Legal Committee and the technical bodies are working steadily to resolve institutional issues. The GNSS Panel is already developing SARPs. Just as some countries have *unwritten* constitutions, the aviation community might well assure itself that legal and institutional issues can be resolved satisfactorily without a GNSS-specific multilateral agreement. Thus, a legal framework, in the sense referred to in the Legal Committee's work program need not be a single multilateral agreement. A new multilateral agreement could require many years to negotiate, and many more to come into force. In an area

characterized by fast-moving technological developments, a new convention would almost surely be rendered technically obsolete before it could be implemented.

2.2.2.2 A serviceable legal framework thus already exists, one which is flexible, adaptable, and amenable to being elaborated to meet new technical challenges. Indeed, the draft charter of GNSS rights and obligations developed by LTEP merely restates principles already well established in current law. The issue, then, is whether the costs and potential liabilities of a new multilateral convention are outweighed by its marginal—and perhaps even illusory—value.

2.2.2.3 Concerns about duration and quality of services. The United States has reiterated several times its offer of GPS signals free of direct user charge. It has even memorialized that offer in an exchange of letters with the ICAO's leadership (as has the Russian Federation with respect to GLONASS). As a practical matter, civil satellite positioning promises to become a nearly ubiquitous presence (it has been described as a new public utility) that millions of users will depend on. Aviation—and even transportation generally—will be a minority user of GPS signals. As to the continuing availability of the signals in space, it should be noted that only the President of the United States can direct that GPS signals be turned off (pursuant to the same emergency powers he has with respect to other navigation and communications facilities). It is difficult to imagine the drastic circumstances under which he might be counseled to do so. Moreover, the United States has pledged to give six years' notice of termination of the signals.

2.2.2.4 Again, the United States will be providing air naviation *services* based on GNSS in the United States, and will be providing GPS positioning *signals* to the rest of the global community. ICAO member States and regional organizations will be providing GNSS signals, services, and augmentations—as necessary and appropriate—in their respective areas, thus ensuring that GPS can safely be used in their airspace. The obligations of States with respect to air traffic services, regardless of the navaids relied on by services providers, are specified in the Chicago Convention and its Annexes.

2.2.2.5 Nondiscrimination, cost recovery, and commercial equity. The technical bodies working out CNS/ATM implementation have devoted considerable effort to ensuring that GNSS services are provided on a reasonable basis. The technical bodies developed checklists for contracts to assist parties in ensuring that all necessary issues are treated. They have also devoted much effort to studying cost allocation and recovery. As implementation documents emphasize, providers of GNSS services should recover their GNSS services costs, and not use the system for general revenue enhancement. Finally, the principle of nondiscrimination has been built into the implementation process throughout. The obligations of States with respect to nondiscrimination, cost recovery, and commercial equity derive from the Chicago Convention and are specified in greater detail in the Statements by the ICAO Council to Contracting States on Charges for Airports and Air Navigation Services (Doc 9082). These principles already apply regardless of the navigation aids relied on by the providers of services.

2.2.2.6 Certification. Some observers have suggested that ICAO should "license" or "certify" the GNSS space-segment signal providers to confirm that they meet the ICAO Standards and recognize the ICAO Policy on CNS/ATM systems. An alternate suggestion is that ICAO or someone else "certify" the GNSS "system as a whole." These ideas are entirely unrealistic with respect to the exiting providers, of course. The interim GNSS is in place, and operators are relying on it daily. Moreover, these suggestions lack any legal foundation in the Chicago Convention—ICAO has no jurisdiction to "certify" or "license" providers of any air navigation service or navigation aid signal. "Certification" is the sole responsibility of sovereign States who provide the services. They are responsible for meeting any applicable ICAO Standards and Recommended Practices, of course. Just as no State is required to offer a global satellite-based navigation system, no State is obligated to accept use of

it in its airspace. The choice of whether or not to authorize operators to use GNSS provides States the safety valve of confidence in the system.

2.2.2.7 Liability. Liability regimes for accidents due to failures of air traffic management services are well settled, even though there is no uniform global set of rules. In the United States, the government has waived sovereign immunity generally for negligence of its employees through the Federal Tort Claims Act. Other governments have also consented to be sued, and privatized or quasi-privatized air traffic agencies are generally subject to liability suits, and they typically obtain insurance to the extent that they are not indemnified. International claims are brought by governments on behalf of their citizens. (That said, it is very rare for the negligent failure of a *signal* from a navigation aid to be found cause of an accident.)

2.2.2.8 With the advent of GNSS, there has been a lot of talk about its liability implications. Some have advocated the development of a new convention that would, among other things, set out liability rules for GNSS, ostensibly because of the complexity of relationships among operators and services providers and extra-territorial ownership and control of the navigation aids relied upon. Nevertheless, no actor in the GNSS system, to the extent that it can even be envisioned, will have a role that is completely removed from any of the many roles in air navigation played by governments, commercial entities, and individual persons today. Judicial systems are uniquely qualified to resolve complicated, sometimes emotionally charged cases, by determining the applicable legal principles and applying them to the facts, no matter how involved the institutional relationships might be. Judges and juries are quite capable of determining which segment or segments of a complex system failed and allocating accountability.

2.2.2.9 The subject "Liability of Air Traffic Control Agencies" has been under study by ICAO's Legal Committee for nearly three decades. A *rapporteur*, Dr. H.A. Perrucchi of Argentina, has produced a draft convention that would create a global regime—if adopted and brought into force—but little work has been done for a number of years. In 1994 the Council expanded the agenda item to include "Liability rules which might be applicable to air traffic services (ATS) providers as well as to other potentially liable parties". Since then, the Secretariat has prepared no studies, and no one has presented any proposals on subject. Moreover, the Committee has never taken any decision or recommendation on the fundamental issues. Some of these issues include (1) whether an international instrument or model legislation is needed, (2) determination of the choice of law, (3) whether liability is to be based on fault or strict (or absolute) liability, (4) who should have the burden of proof, (5) whether the liability is to be limited or unlimited, (6) whether States or State agencies should have sovereign or jurisdictional immunity, and (7) which courts of which State would have jurisdiction to consider claims. Since States have not indicated any support for an international solution for the *entire* air traffic system—in the absence of any proven practical need—it makes no sense to adopt a global liability regime for a single navigation aid. There have been many previous long-range navigation aids (VOR/DME, LORAN-C, OMEGA, INS, etc.) with many of the same characteristics (such as extra-territorial ownership and control), and none has required its own liability regime.

2.2.2.10 The real liability issue for implementation of GNSS is how participants in the system—governments and commercial entities alike—will mange the costs of risk management. That is not a legal issue, however, but rather embraces a number of related institutional and policy questions that will be resolved only as the implementing institutions and relationships are built.

2.2.2.11 In any case, no one has demonstrated a persuasive reason to separate out liability for aspects of GNSS for treatment separate from those of every other aspect of civil aviation air traffic management—communications, surveillance, and navigation. Indeed, tying implementation of GNSS to the adoption of a new global liability convention could spell disaster for both causes. In particular, faced with the presence of an unratified liability convention, uninformed onlookers might infer that GNSS is especially

dangerous, when, on the contrary, it will provide a quantum leap in safety and air traffic system capabilities and capacities. By the same token, those interested in reforming liability systems might be misled into thinking that liability reform ought to depend on implementation of GNSS, when, on the contrary, none of the perceived shortcomings of current liability regimes is due to the advent of satellite communications and navigation.

2.2.2.12 In any case, implementation of a new liability convention, a politically controversial venture, could face a long, uncertain, uphill struggle. The current decades-long effort to already-agreed-to revision of the Warsaw System is a good illustration. Embarking such a course should be weighed carefully in the light of ICAO's pledge that consideration of legal and institutional concerns will not be permitted to delay technical implementation of GNSS.

3. CONCLUSION

3.1 The good news is that *there are no legal obstacles to implementation of GNSS*, which ICAO has determined to be fully consistent with the current international civil aviation legal regime. ICAO's Legal Committee and a Panel of Legal and Technical Experts have done a good job of identifying existing legal principles that bear on GNSS and fleshing out unsolved legal, institutional, and policy issues. All efforts to identify legal stumbling blocks, however, have been to no avail.

3.2 Technically, and in its operational impact, GNSS may be a quantum leap, but it is not qualitatively different in its institutional and legal aspects from other long-range, overwater navigation aids. Many small details remain to be worked out, but the basic institutional mechanisms are already in place. The Chicago Convention governs the relationships among governments, the international community, and operators. The SARPs provide a mechanism for rulemaking. The current litigation and claims systems handle liability issues with some efficiency. The marketplace will ultimately determine when GNSS is accepted and the degree to which it is relied upon. Multilateral mechanisms may arise—several are currently being explored—to build follow-ons to the GPS and GLONASS as initial GNSS signal providers. Finally, the Legal Committee will work to give shape and meaning to institutional arrangements, but the main work of implementing CNS/ATM will continue to consist of technical efforts in ICAO and policy planning in member State governments and regional planning groups.

4. RECOMMENDATION

4.1 That the delegates note the legal and institutional issues under consideration in ICAO's legal and technical bodies.

4.2 That, although it is neither necessary nor appropriate for this meeting to take any action, delegates consider the desirability of (1) including the issue of GNSS liability in the Legal Committee's agenda item on the liability of air traffic control agencies and (2) conducting further studies of legal issues as long-term GNSS begins to take shape and the practical legal implications can be understood.