

Initial Considerations regarding the Feasibility of an International UNIDROIT Instrument to Cover Liability for Damage Caused by Malfunctions in Global (Navigation) Satellite Systems

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I. – REASONS FOR THE CONSIDERATIONS

At the suggestion of the Italian Government, the UNIDROIT Governing Council held initial consultations at its 85th session in 2006 on the inclusion of a new project in the UNIDROIT Work Programme: the elaboration of an international instrument to cover liability for damage caused by malfunctions in global (navigation) satellite services.

At the 86th session of the UNIDROIT Governing Council in 2007, Governing Council member Professor Sergio Carbone presented a feasibility study (C.D. (86) 20 Appendix), compiled in co-operation with his Italian colleagues Pietro Manzini, Anna Masutti and Walter Vasselli and entitled "The civil liability and compensation for damage resulting from the performing of European GNSS Services". The study, which came to a positive assessment, was submitted together with a working paper (C.D. (86) 20) drawn up by the UNIDROIT Secretariat entitled "Liability for Satellite-based Services".

During its consultations, the 86th UNIDROIT Governing Council agreed that "in view of that interest (of the Italian Government) on the one hand and concerns regarding the wide-ranging applications on the other hand, informal discussions with all potentially interested Governments should be held with a view to

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commissioning, should those consultations have a positive outcome, a broad comparative feasibility study.”¹ In view of the reservations expressed by the author of this article during the session, he and Professor Carbone were requested to pursue the matter further.

The UNIDROIT Note Verbale of 1 February 2008 accompanying the “New Triennial Work Programme (2009-2011)” sent to the member States, had the following to say on this matter: “Furthermore, at the request of the Government of Italy supported by the Governing Council at its 86th session, preliminary research is being conducted by independent researchers on questions of liability for malfunctions of satellite-based navigation and other services.” It was further proposed that the Triennial Work Programme 2009-2011 might include: “3. Work on liability for malfunctions of navigation systems and other satellite-based services.”

The UNIDROIT Governing Council took up this issue at its 87th session in 2008 as part of its discussions of the Triennial Work Programme (2009-2011). In addition to the feasibility study by Professor Carbone *et al* and a paper comprising the comments of the author of this article, set out below, an expert opinion entitled “Civil Liability for Satellite-based Services” prepared by Professor Dr Ulrich Magnus of Hamburg University on behalf of UNIDROIT, was also submitted to the Governing Council to help it in its deliberations. The ensuing discussion having thrown up a fair degree of controversy, a working party was set up to clarify whether it would be feasible to prepare such a new UNIDROIT instrument and to report back to the 88th Governing Council in 2009.²

Both the feasibility study by Professor Carbone *et al* and Professor Magnus’ opinion confine themselves to drawing up a list of the potential problems in the areas of the law of contractual and non-contractual liability as well as problems of private international law and international civil procedure faced by national law, and indicate present thinking on the structure and the contents of an international public law instrument. In accordance with his terms of reference, Professor Magnus did not embark on any examination of policy issues, it being understood that those issues were to be

¹ *Unif. L. Rev. / Rev. dr. unif.* (2007), 142 (150).

² *Unif. L. Rev. / Rev. dr. unif.* (2008), 762 (770).

reserved for the Governing Council itself in accordance with the mandate given. Consequently, these studies do not discuss whether or not it makes sense for UNIDROIT to incorporate a project of this kind in its Work Programme. There is no discussion either of the issues, particularly relevant in this context, of prior involvement by other international organisations in such a project, of the political implications associated with a project of this nature nor, finally, of the ongoing need for regulation in view of other international conventions (covering air, ocean-going and inland waterway traffic, for instance), which already envisage a liability system for damage caused indirectly by satellite navigation errors.

Having been requested by the 86th UNIDROIT Governing Council in 2007 to address this issue, this author has compiled the following thoughts on the issue of feasibility. They deal in detail with the reservations already voiced during said Governing Council session with respect to the issues mentioned above.

II.- NECESSARY DIFFERENTIATION BETWEEN GLOBAL SATELLITE SERVICES AND GLOBAL NAVIGATION SATELLITE SERVICES

In the matter of feasibility, a distinction needs to be made between global satellite services in general and global navigation satellite services in particular. No such distinction is made in the documents for the 86th Governing Council in 2007 (C.D. (86) 20) or in the Note Verbale on the new Triennial Work Programme. Reference is made there either to satellite services in general or to navigation satellite services and other services. On the other hand, the feasibility study by Professor Carbone *et al* addresses only navigation satellite services and, more precisely, only those of the European Galileo system. A article³ published recently by the co-authors of the Carbone study, Pietro Manzini and Anna Masutti, also confines itself to the Galileo services, as does the expert opinion prepared by Professor Ulrich Magnus.

Global satellite services in general are provided by both public and private operators. They serve public and private purposes and have public and private users. Individual uses vary tremendously;

³ P. MANZINI / A. MASUTTI, "An International Civil Liability Regime for the Galileo Services: A Proposal", *Air & Space Law* (2008), 114.

they range from telecommunications, television and radio applications via weather forecasts, navigation, search and rescue services right up to police, military and secret service uses. Different conclusions will need to be reached concerning not only the liability issues, but also the feasibility of an international instrument. This will depend on whether we are looking at public or private providers, public or private users, applications to maintain public (external and internal) security (*e.g.* police and military services, search and rescue services), the provision of basic public services and the infrastructure required by the State (*e.g.* weather reports for shipping and air traffic, telecommunications), other public services or uses for purely private purposes (navigation of private motor vehicles). A feasibility study assumes that these very different uses can be individually identified, thereby allowing definitive exclusion of those areas which are entirely unsuitable for a liability regulation deriving from an international agreement (presumably all the satellite-based services run by public providers and uses for public purposes). To this end, an empirical study must be carried out before any assessment of feasibility can be made.

However, if the focus is restricted to global navigation satellite services, the area of application is much narrower and more specific, thus allowing feasibility to be assessed, which was the case in the Carbone study. There are just two systems in this sector (GLONASS, GPS), run by two public operators (Russia, United States of America). A third system, Galileo, now under construction, is to be operated from 2013 onward by a public-private partnership (PPP) in a legal form under private law. Neither the European Community, which is underpinning this system with political support, nor its Member States wish to operate the system themselves. The Galileo services comprise navigation services only. These services can be used for both public (*e.g.* military, police) and private purposes. There are reasons for doubting whether the use of navigation services for public purposes is a suitable subject for an international agreement. But even if the scope were to be limited to navigation satellite services for private purposes, other, serious reservations would need to be considered.

III. – STUDIES CARRIED OUT BY OTHER INTERNATIONAL ORGANISATIONS TO ELABORATE

AN INTERNATIONAL INSTRUMENT COVERING LIABILITY FOR NAVIGATION SATELLITE SERVICES: ECONOMIC AND LABOUR IMPLICATIONS

Liability for navigation satellite services deriving from international instruments as such and their individual regulations have been the subject of extensive investigations and consultations in the international arena for many years now.

1. Studies prepared by the International Civil Aviation Organization (ICAO) and the European Civil Aviation Conference (ECAC)

The development of a legal framework to govern the implementation of GNSS has been on the Work Programme of the Legal Committee of the International Civil Aviation Organization (ICAO) since 1992. First of all, a committee of legal and technical experts was established by the ICAO Council in 1995 which led to the adoption of a charter on the rights and obligations of States relating to GNSS services at the 32nd ICAO Assembly in 1998. However, this alone was not considered adequate, as several aspects related to certification, operating structures, administration, cost recovery and, most importantly, liability were not addressed. The liability aspects in particular were found to merit further examination. The 32nd ICAO Assembly in 1998 set up a new Study Group, the Secretariat Study Group on Legal Aspects of CNS/ATM Systems, which reported to the 33rd ICAO General Assembly in 2001. The 33rd Assembly mandated the ICAO Secretariat Study Group to finalise a contractual framework, focussing predominantly on model clauses (ICAO doc A36-WP/140, para. 1.1).

The main purpose of the contractual framework was to provide a number of legal and institutional provisions that were deemed necessary to address GNSS at the regional level. The contractual framework is based on a two-tier approach. On one level, it offers a regulatory agreement dealing with public law matters including certification, liability and jurisdictional matters. Another level consists of private contractual agreements between the various stakeholders in which they would have a very large degree of autonomy, subject to certain mandatory elements determined by the regulatory agreement (ICAO doc A36-WP/140, para. 1.2).

The author of this article was himself a member of the EUROCONTROL Legal Task Force on GNSS Liability from 1999 to 2001. These consultations were, however, not concluded, being incorporated instead in the work of the ICAO Study Group on Legal Aspects of CNS/ATM Systems.

The Study Group submitted its final report in 2004. The report had the following to say, *inter alia*, about the issue of liability (ICAO doc. C-WP/12197):

“3.3.2 Approaches to the issue of *liability*

3.3.3 The Group identified three possible approaches to the problem of *liability* relating to GNSS:

- (a) to ensure that the doctrine of sovereign immunity and related principles will not be an obstacle to bringing all potential defendants, including all parties involved in the provision of the GNSS services, into legal proceedings before the court where the victim of an accident involving failure or malfunction of GNSS has brought action;
- (b) to establish an adequate recourse action mechanism for the state having jurisdiction under article 29 and the aircraft operator to take recourse against the other party or parties (mainly the primary signal provider and the augmentation signal provider) involved in the provision of the services, to the extent that such other party or parties have been negligent in the provision of the signals; or
- (c) to ensure adequate compensation coverage through compensation fund arrangements, as have been set up in the field of maritime transport and other fields.

3.3.4 The group had detailed and lengthy discussions concerning the possible approaches to the problem of *liability*. A part of the group believed that, in order to achieve universality and certainty of the new air navigation system, the issue of *liability* should be dealt with under a universal regime and should not be left to national law. Another part of the group, however, did not consider it necessary to establish a new universal *liability* system or a liability convention for GNSS, since there was no indication that the current *liability* regime under domestic law could not cope with GNSS, and further, since there was no connection between GNSS and the perceived gaps in the *liability* system.

4.1 Pursuant to its mandate as confirmed by the 33rd Session of the

ICAO Assembly, the Study Group also focussed on the consideration of a contractual framework as an interim framework for CNS/ATM systems.
[...]

4.3 Elements of contractual framework
[...]

4.3.6 *Liability*

4.3.6.1 Article 6 provides that the *liability* of each party for failure to perform its obligations under this contract shall be governed by the *liability* regime applicable to its activity. This clause focusses on *liability* between parties in the contractual context, without addressing the issue of *liability* towards a third party.
[...]

5.2 Discussion of an international convention in the Study Group
[...]

5.2.2 One view was that since a great number of states would have to authorize the use of GNSS signals, over which they have no control, the only way to secure confidence in the system would be by committing both providers and users to accept certain rights and obligations in the form of a binding international legal instrument. In the view of these members, the international convention should set out, *inter alia*, such principles as the acknowledgement of the paramount importance of the safety of international civil aviation, unlimited access to GNSS services on a non-discriminatory basis, the sovereign right of every state to control operations of aircraft and enforce safety regulations within its airspace and the obligation of providers to assure continuity, availability, accuracy, transparency and *liability* of GNSS services. It was further pointed out that the liability issue is an essential element of the legal framework of GNSS, particularly in view of the multiplicity of the players and possible litigations taking place at the same time for the same event in a number of countries. According to this view, the implementation of a worldwide seamless and interoperable system such as CNS/ATM would not be compatible with a scattered *liability* system. These members supported the development of an international convention which they believed had been an option favoured by the vast majority at the Rio Conference, and the 32nd and 33rd Sessions of the Assembly. They saw the contractual framework as a flexible interim solution from which an international convention or other binding instruments might evolve.

5.2.3 A second view was that ICAO's existing legal framework, namely

the Chicago Convention, its Appendixes and the other elements[], including applicable domestic law, offered continued serviceability and no deficiencies had been found to impede the implementation of CNS/ATM Systems. It was unnecessary to establish a new universal *liability* system or a *liability convention* for GNSS, since there was no indication that the current liability regime under domestic law could not cope with GNSS, and further, since there was no connection between GNSS and the perceived gaps in the *liability* system. While legal issues had been discussed in various bodies of ICAO, at no point had any ICAO body achieved consensus on a proposal for new global conventional law. At the same time, every ICAO body which had considered legal issues relating to CNS/ATM had been careful to state that work on legal issues must not be permitted to delay technical implementation of CNS/ATM systems.

[...]

5.2.6 At the end of the discussion on the subject of a draft convention and its specific clauses most members present observed that since the implementation of GNSS was in progress, there was not enough experience on which the drafting of an international convention could be based. It was therefore advocated not to pursue this matter, pending further development of GNSS."

This report was presented to the 35th ICAO General Assembly in 2004 for its attention and the adoption of a resolution (ICAO doc. A35-WP/75).

The European Civil Aviation Conference (ECAC), acting on behalf of its 41 members, also submitted a working paper (ICAO doc. A35-WP/125) to the 35th ICAO General Assembly. The draft of a "contractual framework" was first presented as Appendix B to this working paper, which states the following:

"4.1 A contractual framework which addresses GNSS must provide a unified structure capable of addressing both public law and private law arrangements between the various stakeholders. It needs to be comprehensive in coverage, addressing the full range of issues that concerns those stakeholders. The contractual framework proposed by the ECAC States is attached in Appendix B. It is not new. It was already presented and discussed at the 33rd Assembly, which asked for this completion as an interim step towards the development of a possible convention.

4.2 It is based on a two-tier approach. On one level, it offers a

regulatory agreement dealing with public law matters including certification, *liability* and jurisdictional matters. The second level is private contractual agreements between the various stakeholders in which they would have a very large degree of autonomy subject to certain mandatory elements determined by the regulatory agreement. These mandatory elements would focus, *inter alia*, on compliance with SARPs with regard to continuity, availability, integrity, accuracy, reliability, recognition of (*strict*) *liability*, compulsory risk coverage, recourse to arbitration, waiver of right to invoke sovereign immunity. Harmonisation of these essential parts of the contracts would help achieve a framework where the roles and responsibilities of all players involved are clear to all and where relationships are defined.

4.3 The two main elements of this contractual framework, therefore, are the private law contracts to be concluded between the parties involved in the chain of implementation, operation provision and the use of GNSS signals and systems and the public law agreement between states involved to ensure these contracts are harmonised in order to contain the same essential provisions on safety, certification, liability etc. In this way, the necessary distinction between the public and private law elements of this proposed contractual framework will be ensured.

4.4 The contractual framework being proposed by ECAC states is not a GNSS Convention. While it includes binding elements, it also creates a flexible and readily available framework to cover all legal and institutional elements relating to GNSS at the regional level and harmonises contractual relationships between the parties involved, providing clarity and legal certainty. It may, however, provide experience and know-how and represents a first step, which could evolve into a long-term focussed and precise global instrument of international law under the aegis of ICAO."

By way of a long-term solution, the ECAC further submitted a draft convention in the form of Appendix C to this working paper, which states the following:

"5.2 The objective would be to achieve a dedicated convention limited to the essential common elements for legally and institutionally adequate provision of GNSS services. It would address, in particular, *liability*, including the issue of *third party liability* which cannot be adequately addressed through the contractual framework solution. This convention is foreseen to be the most appropriate way to address all parties affected by such a global system in the long term."

The 35th ICAO General Assembly in 2004 resolved to finalise a “contractual framework” in line with the ECAC proposal.

This issue was discussed again at the 36th ICAO General Assembly in 2007, although this time no longer as a separate item on the agenda but as part of the “Work Programme” item. To this end, ECAC again submitted a working paper (ICAO doc. A36-WP/140), which has the following to say on liability:

“2.7 The issue of *liability* has been widely debated in the context of the Galileo and EGNOS programmes over the past three years. The most important topics have been *Third Party Liability*, Design Risk, *liability* associated to the system operations and the Allocation of *Liability*. This illustrates the need for a framework as presented by the ECAC states in order to channel liability.”

The working paper ends with the following conclusions:

“3.1 The contractual framework proposed by the ECAC States has already been recognized by ICAO in Assembly Resolution A 35-3 as a mechanism to create a flexible and readily available framework to cover all legal and institutional elements related to GNSS at the regional level and harmonises contractual relationships between the parties involved, providing clarity and legal certainty.

3.2 Developments in Europe with regard to EGNOS and Galileo confirm the need for such a contractual framework and highlight the need to align the said framework to take on board the need for harmonisation of, *inter alia*, international standards, certification, interoperability, *liability* allocation in a multi-State environment, particularly in the context of the European Single Sky legislation.

3.3: The contractual framework will be refined in the light of these developments and presented as soon as possible to the ICAO Secretary General and Council, as foreseen in the resolution. It is envisaged that the framework will satisfy the needs widely voiced in ICAO regarding GNSS and will assist in clarifying many of the difficult issues faced and serve as a useful basis for ongoing discussions in the Legal Commission.”

However, the 36th ICAO General Assembly in 2007 no longer regarded the finalisation of the “contractual framework” as a task for the ICAO, seeing responsibility for it as resting exclusively with the ECAC. The report of the 36th General Assembly in 2007, Legal

Commission (ICAO doc. A36-WP/297) has the following to say on this matter:

“47.9 The Commission noted its understanding that once a model of a regional framework is developed by the members of the European Civil Aviation Conference, such model could be distributed through ICAO to its member states, and interested states may use the information as guidance material to develop their own regional legal framework as appropriate.”

Finally, the 36th ICAO General Assembly in 2007 downgraded the priority of this project from 1 to 3. Such low priority in effect means that the ICAO has washed its hands of the project.

At the meeting of Directors General held in Erevan (Armenia) from 28 August to 1 September 2008, the ECAC, at the instigation of EUROCONTROL, then looked at the liability issues of the Galileo project, giving priority to third party liabilities. Taking into account UNIDROIT’s consideration of whether to adopt this kind of project as part of its own Work Programme, it was decided to approach the ICAO (Legal Committee) once again and to draw attention to the urgency of establishing a “Framework Agreement” (ECAC doc. DGCA/57(SP)-SD, p. 6). It is, however, doubtful whether - following the decisions of the 36th General Assembly (see *supra*) - the ICAO will ever deal with the matter again.

The author of this article is not aware of any similar studies having been carried out in other international organisations concerning liability for satellite navigation in other traffic sectors. If so, they would need to be examined.

2. Preliminary work on a European Community Regulation

In late 2006; the Italian Government launched an initiative for a European Community Regulation on liability.⁴ A “European GNSS Initiative for an EU Regulation on Third Party Liabilities (TLP)” was presented and discussed with the participants at an international workshop held in Rome in December 2006 / January 2007. A “Draft

⁴ E.M. GIEMULLA / O. HEINRICH, “Verantwortlichkeit und Haftung für Galileo-Dienste und ihre Bedeutung für die Systemfinanzierung und -kommerzialisierung”, *Zeitschrift für Luft- und Weltraumrecht (ZLW)* (2008), 25 (37).

Regulation on civil liability and compensation for damage resulting from the performing of Galileo services" was presented aimed at establishing a legal liability basis for damage caused by commercial Galileo services for the area covered by the European Community, with effect beyond the Member States as a result of individual user States outside the EC acceding to the Regulation through bilateral agreements under international law. This Italian proposal for an EC Liability Regulation has reportedly now been forwarded to the EC Commission.

The European Community itself has meanwhile started giving initial consideration to a Liability Regulation. It presented a draft "Strategic Framework for the GNSS for the European satellite radio-navigation programmes (EGNOS and Galileo) and related activities" in October 2008 which also takes a stance on liability issues. For 2009 it holds out the prospect of the "definition of the liability policy for contractual and non-contractual liability for the different services" (Council Document 13759/08).

In view of the fact that the ICAO has been engaged in consultations for over 15 years now on an international instrument covering liability for global satellite navigation in air traffic - which will shortly be brought to a provisional conclusion upon definite completion of the final version of the ECAC's "contractual framework" -, it appears very doubtful whether an international convention for global satellite navigation in air traffic is still needed at all and whether UNIDROIT should include the project, when it has evidently failed in the ICAO, on its own agenda. These doubts are reinforced if it is borne in mind that the European Community is intending to present a (general) Liability Regulation for contractual and third party liability which would render a UNIDROIT Convention unnecessary if it were supplemented by bilateral agreements under international law as provided by the corresponding Italian initiative.

With this in mind, economic aspects (unnecessary costs) and labour aspects (unnecessary work) appear all the more significant, as do matters regarding UNIDROIT's external image, should an ICAO project that has proved abortive after years of discussion be taken over or pursued in competition with a project in the hands of the European Community.

IV. –FEASIBILITY OF A UNIDROIT INSTRUMENT COVERING LIABILITY FOR SATELLITE-BASED NAVIGATION SERVICES: POLITICAL AND LEGAL IMPLICATIONS

The above considerations notwithstanding, any international instrument (convention, model law) would have to face the fact that there are currently only two international satellite navigation systems in operation worldwide (three after the installation of Galileo), liability for which might conceivably be the subject for regulation by such an instrument. GPS and GLONASS are really military, not commercial, systems. Their signals are merely made available for private use. It is hard to imagine the countries responsible for these systems subjecting themselves to an international liability regime that was the outcome of international negotiations and was to a large extent heteronomous. Confirmation of this is provided by the consultation process within the ICAO, which renounced its initially global focus to concentrate exclusively on the EU's Galileo system. The Galileo system will not suffer comparable treatment. It enjoys the support of the EC and its 27 Member States, has a commercial dimension and is to be operated on a private basis or at the very least in private legal forms (PPPs).⁵ The subject of the liability is readily identifiable; other subjects of liability are ruled out. An international convention on just one single subject of liability appears highly unusual in an international law context at least. The ICAO, for its part, ultimately renounced this approach. Whether, in addition to the Galileo system after it comes into operation in 2013, other commercial systems will evolve for private use, or whether the existing military systems will undergo modifications is purely speculative and therefore cannot be taken into consideration when assessing the feasibility of a UNIDROIT instrument.

If, for political reasons, consideration were to be given to just one subject of liability in the form of the company operating Galileo, it would make sense for the regional economic integration organisation responsible for the subject or the Member States behind this organisation to set in place a liability regime for it. UNIDROIT has neither the human resources nor the financial means to carry out

⁵ Amended proposal for a Regulation of the European Parliament and of the Council on the further implementation of the European satellite radionavigation programmes (EGNOS and Galileo), COM (2007) 535, (p.) 8.

preliminary studies for an EC liability regime as a service provider for the EC Commission. Having carried out preliminary studies at the international level for many years, the ICAO has evidently also come to realise that this is exclusively or at least primarily a European project; it apparently now regards the ECAC as being responsible for it and has placed the project so far down its agenda that further work on it is to all intents and purposes ruled out. And the line taken by the EC itself does not seem any different line - having announced the presentation, in 2009, of draft texts to regulate liability.

A Regulation under Community law would have the disadvantage of applying only to areas covered by the law-making competence of the Community and would not cover cases of damage occurring outside the Community. On the one hand, and in line with the Italian EC initiative, this could be offset by concluding bilateral agreements under international public law - which would entail the application of EC law - with any countries wishing to use Galileo. On the other hand, an international convention would only be superior to a regulation under Community law if it were not only to come into existence, but were also to be ratified worldwide by all the countries where there are potential users. However, this is very unlikely to happen, especially when it comes to liability for malfunctions in European satellite navigation services. Here, the interests of the EC Member States are likely to be diametrically opposed to those of the States that are not members of the EC. The former will give their political support to the operator and are therefore primarily interested, although users themselves, in both a limitation of liability and the insurability of that liability as essential prerequisites for finding private investors and for setting up a private operating company.⁶ The latter will be exclusively users and, in the event of such a limitation of liability, would see restrictions placed solely on the claims of their users, to which the operating company might otherwise be fully liable in accordance with their domestic legislation. The only conclusion that can be drawn from this for an international convention is that either it would not limit liability at all or limit it only marginally so that the EC Member States would regard it as creditor-friendly and refuse to ratify it or, if liability were to be

⁶ Cf. GIEMULLA / HEINRICH, *supra* note 4, 25 (29, 34 f.).

considerably limited, the non-EC Member States would regard it as debtor-friendly and refuse to ratify it. A compromise regulation, which might be the only way of guaranteeing far-reaching (albeit never worldwide) ratification by both the EC Member States backing the operating company and the non-EC Member States as users, is likely to be hard to achieve given the very disparate interests involved.

Finally, an international (UNIDROIT) convention would come too late for Galileo supposing the system comes into operation in 2013 as planned. No international law-making process is likely to be concluded within the space of time still available, still less is it to be anticipated that an appreciable number of ratifications would be obtainable by that date given the subsequent national legislative procedure that would for the most part be required. Only an EC Liability Regulation can actually guarantee conclusion of the legislative process by 2013; such a Regulation could subsequently be transferred to potential user States outside the EC through bilateral agreements. Moreover, an EC legal instrument, along with bilateral agreements with potential user States, is more likely to find flexible solutions for any peculiarities arising from the Galileo services than would an international convention.

As to the feasibility of an international instrument covering liability for malfunctions of global satellite navigation, a further distinction must be made between:

- contractual und extra-contractual (tortious) liability;
 - services used without a contract and free of charge and services used on a contractual basis and incurring costs;
 - the direct and indirect damage caused by satellite navigation errors;
 - the direct liability claim and the claim of recourse;
 - areas in which liability extending to damage caused by satellite navigation errors is already regulated by special international instruments, and areas in which there is a complete lack of any regulation on liability.
- (a) Anyone paying a fee for the use of satellite navigation services is linked by contract to the system operator.

Damages incurred by the user can, therefore, be regulated on a contractual basis. The claims arising can be made the subject of individual contractual regulations. This is all the more valid in that only a single legal subject – the operator of the satellite-based navigation system – can be considered as both the contractual partner and the liability opponent. Moreover, regulation of liability on the basis of an individual contract is more flexible than contractual liability specified in conventions. Hence it can be assumed that contracts covering the provision of satellite navigation services will contain liability regulations of this kind, for instance in the form of penalty clauses.⁷ Moreover, an international instrument will soon be available in the shape of the ECAC's "Contractual Framework", which will structure contractual liability in this field.

- (b) If damage caused by a system malfunction is incurred not by the first user, who is contractually tied to the system operator, but by a second, third or fourth user, these latter are each linked by contract to the respective prior user and the last prior user to the system operator. What could be more appropriate than to regulate the damages incurred by these other users on a contractual basis in their respective contractual relations and to seek contractual recourse with the respective prior user? On the strength of his contract, the first user in this contractual chain could then hold the system operator liable, allowing claims to be settled within a contractual chain. The respective contract determines the existence, contents and extent of the claim. Statutory regulation, especially one of this kind in an international instrument, appears not only dispensable but indeed hardly suitable, given the individual nature of the contractual relations. This is all the more valid in that ultimately, there is only one subject of liability who has to bear the damage in economic terms at least. This is also the assumption made in the "Contractual Framework" for satellite navigation in air traffic, which is to be limited to the key elements of liability in

⁷ GIEMULLA / HEINRICH, *supra* note 4, 25 (35).

these contractual relations.

- (c) In the event of doubt, persons taking advantage of satellite navigation services without making any payment will not be tied by contract to the system operator. The use of services free of charge without any contract having been concluded is unlikely to have any consequences in terms of either contractual or non-contractual liability. In the event of doubt, the system operator will be well advised, when starting services free of charge, to make it clear by means of a statement readily accessible to anyone availing themselves of the services that the use of these services free of charge is undertaken at the user's own risk and that no liability will be assumed. No-one permitted to use services offered free of charge and without a contract being signed will expect liability to be assumed should any malfunctions occur in the system, along the lines of "what is free of charge is worth nothing."
- (d) However, if the contractual liability does not fully cover all damages, or if the respective contractual partner is not solvent, an extra-contractual liability can be considered for the settlement of claims. The same holds true of cases in which the injured party is tied to the system operator neither directly nor indirectly, *i.e.* by means of an uninterrupted contractual chain (third party liability). Only for extra-contractual liability need serious thought be given to a regulation by means of an international convention. This is because in such cases, individual contractual regulations cannot grant compensation, or at least adequate compensation, and the "Contractual Framework" covering liability for global satellite navigation in air traffic for its part does not encompass forms of liability between legal subjects that are not contractually tied to one another. The Italian initiative for an EC Regulation on liability is evidently also limited to extra-contractual liability and, moreover, only to cases in which there is a lack of any direct or indirect contractual relationship between the injured party and the system operator (third party liability).

- (e) Extra-contractual liability can only be of practical relevance in cases in which the user, who is directly tied by contract to the system provider, or the users, who are contractually tied to this user or his successors, suffer damage but do not receive full compensation because, for example, the maximum limits for liability have already been reached (e.g. in international air traffic pursuant to Article 21, paragraph 2 of the *1999 Montreal Convention for the Unification of Certain Rules for International Carriage by Air*), which may not be exceeded in an individual contract or by a "Contractual Framework" (Article 29 of the Montreal Convention), or in which damages are incurred by third parties outside these contractual relations (third party liability). As a rule, damages of this kind will only have been caused indirectly by system malfunctions in satellite-based navigation services but directly by another object (generally a vehicle), which was misdirected because of the malfunction. This applies, for instance, to accidents involving ships or aircraft in which passengers (or their goods), primarily third parties who were not conveyed by these vehicles, incur damage.

On the other hand, there are already numerous international conventions for such cases of damage that grant compensation to the injured party irrespective of the causality of a system malfunction in the satellite navigation. In the field of shipping, these include the *2002 Athens Convention relating to the Carriage of Passengers and their Luggage by Sea*, and the *1992 International Convention on Civil Law Liability for Oil Pollution Damage*; in inland waterway traffic the *1988 Strasbourg Convention on Limitation of Liability in Inland Navigation*; in air traffic the *1952 Rome Convention Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface*, the *1929 Warsaw Convention for the Unification of Certain Rules Relating to International Carriage by Air* and the *1999 Montreal Convention*; and in special cases (e.g. the transport of nuclear material) also the *1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy* and the

1963 Brussels Supplementary Convention to the 1960 Paris Convention. Hence only minor gaps in protection will remain (in air traffic liability, for instance, for damages exceeding the maximum liability limits specified in the aforementioned conventions or for damages to which the conventions do not apply and which are not covered by the “Contractual Framework” of the ECAC). These gaps in protection require elaboration in detail, but that would exceed the scope of these considerations. Only where such gaps in protection are ascertainable can a need arise at all for action to be taken concerning a new international instrument. Otherwise liability would be established on the basis of a new international instrument that would add to the existing liabilities deriving from international conventions. This would only lead to unnecessary duplications and barely resolvable problems of differentiation.

- (f) While such gaps in protection may remain in the existing international conventions and the Contractual Framework, they will generally be closed by domestic legislation applied by extension. In most cases this will involve domestic tortious liability in general and domestic product liability in particular.⁸ Given a product liability which entails considerable liability risks and is getting out of hand in individual countries, the EC and its Member States are understandably keen to harmonise domestic product liability in the field of satellite navigation. However, elaborating such an instrument and ensuring its ratification by those States to which it is addressed at least would appear to be a largely futile undertaking. Moreover, it is very difficult to justify harmonising product liability or general liability in tort only for this relatively small segment of satellite-based navigation, rather than in general terms. Ultimately, any product liability covered by an international treaty would be required to resolve the difficult problem of the EC having a product liability directive, and thus a liability regime of its own for

⁸ For a detailed discussion of the situation under German law, see GIEMULLA / HEINRICH, *supra* note 4, 25 (29 ff.).

product liability in general, which would infringe product liability regulations in international conventions for special products. This contradiction will be almost impossible to resolve without a regulation under Community Law on satellite navigation liability.

Moreover, while the need for harmonisation in this respect was studied in depth during the ICAO consultations, it proved impossible to reach agreement on the need for the relevant legal harmonisation (see the Final Report of the Secretariat Study Group (ICAO Doc. C-WP/12197). In the meantime, the matter would appear to have resolved itself with the *de facto* abandonment of the project by the ICAO.

The regulations referred to under (e) encompass only liability claim as such but not the right to recourse of the airline, ship owner or fund, whose aircraft or ship was misdirected because of a defective satellite navigation signal and as a result inflicted damage on the legal assets of others. As a rule, however, the person liable to the directly injured party in such cases will enjoy contractual relations with a user who is in direct or indirect contact with the system operator (*e.g.* the directly liable airline with the air traffic control organisation and this organisation, in turn, with the satellite navigation operator). In such instances, recourse may be had within the contractual relations described under (b) above with no need for an international agreement that might anyway prove unhelpful because of its lack of flexibility.

V. – CONCLUSION

It is indisputable that a commercial system of global satellite navigation, functioning in legal forms under private law - as in the case of Galileo, which is supposed to come into operation from 2013 onwards - requires such regulation of liability as will strike a balance between, on the one hand, user interests in the undisturbed use of the services concerned, as well as third party interests in the protection of their absolute rights against disturbance by these services, and, on the other hand, service provider interests in keeping such liability as low as possible, or at least in making it calculable and insurable. Even if the foregoing considerations may also require

further elaboration on numerous points, it is nonetheless already clear in the light of these initial considerations that there exist not insubstantial misgivings of a political, economic and legal nature as to whether this can be accomplished through a UNIDROIT Convention. With its political responsibility for Galileo, it is the European Community that is called upon in the first instance to ensure that there is a liability regime bearing relevance to Galileo. Only when a market situation has evolved, extending beyond this first non-military and commercial satellite navigation system and encompassing commercial service providers, will there be a truly supranational interest in comprehensive regulation under international law, such as can be taken up by an international organisation like UNIDROIT - which is not confined to particular regions - especially at the stage where the market participants concerned start their own initiatives in this direction.