



**POLICY ASPECTS OF  
THIRD PARTY LIABILITY IN  
SATELLITE NAVIGATION**

**PREPARING A ROADMAP FOR EUROPE**

**Report 19, July 2009**

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## Preface

This ESPI Report is different from other Reports, since it contains the Proceedings of a Workshop held at the institute. This Workshop dealt with “Policy Aspects of TPL in Satellite Navigation – Preparing a Roadmap for Europe” and took place on 15 May 2009 at ESPI in Vienna. The present Report puts the contributions of the three main speakers together and complements them with an introduction, a summary of the panel and general discussion as well as conclusions, which have jointly been prepared by the editors. The editors would like to thank Galina Ivanova and Christophe Venet for their support in managing the Workshop and Hanneke in ‘t Groen for supporting the editing of this Report.

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# 1. The Setting

## 1.1. The Current Status of Satellite Navigation

The application of GNSS services has proliferated remarkably since its creation by the US Department of Defence in the 1970's. Although owned by the US Air Force and initially designed to serve military purposes GPS has been open to free civilian use since 1983. Currently, GPS is the only fully operational GNSS system used for civilian purposes all across the globe.

Despite GPS being the major satellite positioning system, other major initiatives have been put forward during the last decades. First among them is the Russian GLONASS which was entirely deployed by 1995 and fully operational until it fell into disrepair with the demise of the Soviet Union. Currently Russia has committed to restoring the system working in partnership with the Indian Government for this purpose. Most recently, another major space faring nation has come into play in the field of GNSS. In April 2009 China launched the first satellite of the Chinese regional Satellite Navigation System Compass. Compass will consist of 10 satellites to be launched by the end of 2010 and will potentially be converted into a Global Navigation Satellite System.

In Europe, the Galileo programme was set up in 2002 by means of an EC Regulation<sup>1</sup> creating the Galileo Joint Undertaking at the Initiative of the European Commission. Galileo was born as the civil use alternative to the military oriented GPS while being more precise and offering a wider range of possibilities. Posterior governance related issues have delayed the deployment of the European GNSS system for an estimated period of around five years (Galileo is now expected to be fully operational in 2013). As a consequence, in July 2008 the GNSS programme was relaunched with the adoption of Regulation (EC) No 683/2008<sup>2</sup>.

<sup>1</sup> EU Council. Council Regulation Setting up the Galileo Joint Undertaking (EC) 876/2002, 21 May 2002 ([2002] OJ L 138/1), amended by Council Regulation 1943/2006 ([2006] OJ L 367/21).

<sup>2</sup> Ibid.

Currently, the operational European GNSS consists on EGNOS, the precursor of Galileo developed as an initiative by ESA, the EC and Eurocontrol and designed to complement GPS and GLONASS making them suitable for safety critical applications. The EGNOS deployment period ended in 2008 and is already transmitting signals, its open service is expected to start already in late 2009. With this purpose, EGNOS assets have been transferred to the EC in April 2009. Further services by EGNOS, i.e. Safety of life Service, will be available later in 2010.

On the other hand, Galileo is currently in transition from the validation period to the deployment period. It is expected that all 30 Galileo satellites will be deployed by and ready to commence operations in 2013. When Galileo becomes operational it will be able to provide a range of four service categories that will be applicable in commercial operation, safety of life actions and public regulated services.

Galileo is one major example of the growth of GNSS services which will be able to feed a vast number of services ranging from the widespread navigation services for road, rail and aviation transport to time transfer and synchronisation or road pricing. In addition to the most common use in transport, GNSS has been integrated in areas such as agriculture, civil engineering or finance transactions and has become essential for civil protection and disaster management.

## 1.2. Issues of Third Party Liability

As highly critical sectors rely strongly on GNSS services, potential accidents caused by GNSS signal malfunction involve the risk of potentially high damages. So far no dedicated legal framework exists to lay down the basis for liability claims.

While there is no dedicated Third Party Liability (TPL) regime for GNSS, other laws regulating TPL matters may be applicable



such as the UN Liability Convention<sup>3</sup> or the Chicago Convention<sup>4</sup>. Other International Conventions such as the Conventions on nuclear damage or oil pollution<sup>5</sup> could be applicable in cases of nuclear or environmental catastrophes caused by a GNSS malfunction. It is also argued that GNSS TPL questions can be ruled by tort law actions or dealt with in the context of contractual obligations. However, none of the mentioned formulas suits the specificities of GNSS TPL issues.

In Europe the Council Regulation (EC) No 683/2008 establishes the legal basis for the European GNSS programmes as adopted after the European Commission proposal for reprofiling the GNSS programmes<sup>6</sup> and the subsequent European Council and Transport Council Conclusions. The regulation lays down the basis for further implementation of the two GNSS programmes including governance and financing matters.<sup>7</sup> Although it does not cover the legal framework for TPL, it recognises<sup>8</sup> that the EC may be obliged to bear unforeseen financial obligations relating to non-contractual liability and lays down the basis for a Commission proposal to be issued in 2010 covering financial obligations which are the consequence of the responsibility related to the public ownership of the system. Non-contractual liability specially regarding *force majeure* and *catastrophic failure*.

### 1.3. Policy Issues of TPL

GNSS TPL encompasses particular economic matters. On the one hand, because of the transborder nature of GNSS services, the

damages caused by satellite navigation defaults have a potentially high financial and economic impact. On the other hand, the Galileo governance comprises a complex structure of public and private/commercial actors which may be held liable for damages to third parties. Furthermore, the potentially high risks linked to the failure of satellite navigation systems will deter private investment if private actors are held unlimitedly liable. Therefore, it is crucial that the share of responsibility between private and public operators is clear-cut as well as that liability conditions are shaped according to the financial capacities of the different actors.

In this sense, a TPL regime must be based on the principles of strict liability (i.e. it is the duty of the operator to prove that it is not liable) and limited liability (i.e. liability is limited to a predetermined amount) in order to ensure a fair compensation to victims. Mechanisms such as the set up of liability limits, the insurance obligation or the provision of supplementary compensation provide for the assurance that victims will obtain full compensation while allowing private actors the legal certainty for financial foresight and business planning.

While these seem to be commonly acceptable principles, the type of legal framework that will encompass such principles seems to be less clear. However, the need for legal certainty regarding the principles above mentioned, together with the trans-border nature of GNSS services indicates that an international legal framework specific to satellite navigation TPL needs to be adopted. In this line the two prevailing options are the adoption of a European Regulation that would complete the set of governing rules for GNSS and on the other hand the adoption of an international convention setting up standards that would be valid beyond the borders of the EU, and therefore applicable to all international operator.

Initiatives in these lines have already been taken by several actors. The EU is already foreseeing the initiation of inter-institutional discussions in 2010 with the purpose to adopt financial measures including TPL matters by 2013. In parallel, since 2001 the International Institute for the Unification of Private Law, Unidroit, has been conducting work on the preparation of the preliminary draft protocol to the Cape Town Convention on Matters Specific to Space Assets which is aimed at establishing a uniform legal framework for the registration and enforcement of security and equivalent interests related to high-value mobile

<sup>3</sup> UN General Assembly, Convention on International Liability for Damage Caused by Space Objects, Resolution 2777 (XXVI), 1 Sep. 1972; UN General Assembly, Outer Space Treaty, Resolution 2222(XXI) 10 Oct. 1967. Art VII. See in this regard Hobe, Stephan, Schmidt-Tedd, Bernhard and Kai-Uwe Schrogl eds. Cologne Commentary on Space Law (Vol.1): Outer Space Treaty. Cologne: Carl Heymanns Verlag, (2009). 131.

<sup>4</sup> ICAO, Convention on International Civil Aviation (Chicago Convention), 7300/9, Chicago, 7 Dec. 1944.

<sup>5</sup> IMO, Convention on Civil Liability for Oil Pollution Damage (CLC), 19 June 1975, replaced by its protocol of 1992 as amended in 2000; NEA, Convention on TPL in the Field of Nuclear Energy, 29 Jul. 1960, as amended by its additional protocol of 1964 and by the protocol of 1982; IAEA, International Convention on Civil Liability for Nuclear Damage, Nov. 1977.

<sup>6</sup> EU Council and European Parliament. Regulation on the further implementation of the European satellite navigation programmes (EGNOS and Galileo), (EC) 683/2008 ([2008] OJ L 196/1)

<sup>7</sup> Ibid. Art. 2.

<sup>8</sup> Ibid. Recital 22.

equipment such as satellites. In addition technical bodies with regulatory powers such as Eurocontrol or the European Standardisation Organisations can play an important role at establishing liability parameters. Equally, due to their regulatory powers, these bodies are crucial for putting forward the legislative approach to meet future capacity and safety needs at European level.

Currently there is a need for a framework that will provide legal certainty regarding questions of jurisdiction for claims, determination of the applicable law and questions of immunity. Equally, there is a general understanding that principles for GNSS TPL need to be established. The formal instrument to be adopted with this aim is still subject to debate and subject to different approaches. The contemplated options range from the continuation of the current situation where GNSS liability issues would be decided by the application of other substantive international treaties or tort claim rules, through the adoption of international guidelines to inspire contractual agreements to the adoption of an international legal instrument such as a convention.

Whichever may be the modality opted for, the adopted framework will have to be able to address questions of public-private share of GNSS services, the definition of the material scope of a TPL framework for GNSS regarding the type of services and applications that may be able to involve GNSS liability and questions of immunity and claim jurisdiction.

In this regard an international framework setting the common standards seems to be desirable but practical questions of a European GNSS system being soon operable seem to require a more immediate regional solution in the form of an EC regulation.

### *1.4. The Workshop*

The Workshop on “Policy Aspects of TPL in Satellite Navigation – Preparing a Roadmap for Europe”, the centrepiece of this ESPI Project, took place on 15 May 2009. It was

composed of two parts: invited presentations and a roundtable with following general discussion.

The three presentations were given by outstanding experts in the field. First, Ulrich Magnus, Professor at the Max Planck Institute for Comparative and International Private Law, Hamburg, spoke about “The Present State of TPL in Satellite Navigation and Its Shortcomings”. Then, Sergio M. Carbone, Professor at the University of Genoa introduced “The Rationale for an International Convention on TPL in Satellite Navigation”. Finally, Anna Masutti, Professor at the University of Bologna, outlined “GNSS: The Basic Principles for a European Legal Framework on TPL”. The three presentations started with a general perspective on TPL in international law, then set out the drafting of an international convention as the necessary general approach and finally provided concrete suggestions for the content of a legal framework on the European level. The presentations therefore built upon each other in providing a comprehensive, structured and practicable account.

Responding to this outset, the roundtable, which aimed at identifying elements for a European roadmap, comprised main actors in the field. These were the European Commission, represented by Davis Seité and Giedre Valentaite, ESA, represented by Theirry Herman, Eurocontrol, represented by Caroline Mantl and industry, represented by Walter Vasselli (Finmeccanica). In the audience, and contributing to the debate was also Unidroit, represented by its Deputy Secretary General Alessandra Zanobetti. The roundtable, moderated by the Workshop chairs Alfredo Roma and Kai-Uwe Schrogl, primarily discussed the issue, whether the preparation of an international convention would happen in time for the entering into service of Galileo, or whether TPL legislation would have to be implemented for Europe before on an ad hoc basis with the work on an international convention going on in parallel. A more detailed summary of the roundtable and general discussion is provided in chapter 3 of this report.



Speakers and panellists at the workshop from left:  
Walter Vasselli, David Seité, Alfredo Roma, Matxalen Sánchez Aranzamendi, Giedre Valentaite, Caroline Mantl, Anna Masutti, Ulrich Magnus, Sergio Maria Carbone, Thierry Herman and Kai-Uwe Schrogl.

While the roundtable discussion was able to provide a positive opportunity to exchange views and seek common understanding of the necessities of implementing regulations and on the timelines for this, it could not enter into a more thorough debate on a concrete roadmap. This task has been taken up by the editors and the result of this is presented in chapter 4 of this Report.



## 2. Contributions to the ESPI Workshop of 15 May 2009

### 2.1. *The Present State of TPL in Satellite Navigation and Its Shortcomings* by Ulrich Magnus

#### 2.1.1. Introduction

After the Internet another global technical network has entered the scene and like the Internet it is also almost indispensable for daily life. That is the technique of Global Navigation Satellite Systems (GNSS) like the US system GPS, the Russian system GLONASS or the EU system GALILEO. This technique is used already everywhere on the globe; it is extremely useful for all kinds of transportation and for many other purposes. But as always where there are advantages there are also certain risks. If the respective system does not function correctly it can cause considerable damage. Given the worst case the system's malfunction can even lead to catastrophic losses. Examples would be the going down of an ocean cruiser with several thousand passengers or the crash of an airplane into a densely inhabited area or the wreckage of an oil tanker with consequential pollution of the environment, all due to a failure of a global navigation satellite system. In such cases the question of liability of the system operator and the compensation of the damage is inevitable. Since cases of the described scenarios will almost necessarily have an international character the liability and compensation issue is, however, of a complex and complicated nature. The following paper deals with the present state of liability for damage caused by the malfunction of a Global Navigation Satellite System. The paper focuses mainly on TPL, leaving more or less aside contractual liability.

#### 2.1.2. The Present Legal Framework

##### *General considerations*

If one takes the hypothetical case that a person has suffered damage or that the environment has been impaired through the

malfunction of a global navigation satellite system the question of liability and compensation will regularly raise rather difficult problems of private international law and international procedural law before any substantive law can be applied. The reason is that it is highly unlikely that all those who have suffered damage and those who could possibly be held liable live in the same country and are governed by the same law. The global availability of the satellite navigation systems entails global effects of their malfunction. The subject has therefore a natural international dimension.

An additional fact further complicates the situation, namely the complexity of global navigation satellite systems. A great number of institutions, businesses and persons contribute to their functioning. Although at present state authorities dominate the GNSS also private manufacturers are involved. In case of damage caused by a malfunction of the system any or even all of those involved can therefore be responsible for that malfunction. Thus, if a person who has suffered damage claims compensation it is necessary to determine the competent jurisdiction and the applicable law with respect to each possible defendant. And if a state – or in the case of the European Union the Community – shall be held liable the further question has to be decided whether it can be sued in a foreign court or whether it can invoke the defence of state immunity. All this multiplies the difficulties of the legal problems connected with a possible disastrous malfunction of GNSS.

##### *National compensation schemes*

Apparently, most countries do not have specific regulations for compensation in case of mass disasters while some have provided for a public compensation fund for such cases.<sup>9</sup> Nonetheless, it is not rare that the respective state will provide for help on an *ad*

<sup>9</sup> Micheal G. Faure and Ton Harlief eds. *Financial Compensation for Victims of Catastrophes: A Comparative Legal Approach*. Vienna: SpringerWienNewYork, 2006, 415 et seq.



*hoc* basis. The level of compensation by such measures differs however widely between the different countries depending on the financial support made available in the involved country. Generally only part of the ensued damage will be compensated.<sup>10</sup> Such schemes and state interventions are likely to be called on by victims, should a catastrophic damage through GNSS malfunction occur. But at best part of the damage is covered and part of the victims receive compensation. Therefore the traditional rules on liability in contract and tort remain important.

#### *Contractual liability vs. tortious liability*

It increases the complexity of legal problems connected with compensation for damage through GNSS malfunction that a damages claim can be based on contractual or tortious liability or on both and that the rules on private and procedural international law often vary for both. In most situations envisaged here there will be no contractual bond between claimant and defendant. Then, any liability can only be based on tort. Nonetheless, contractual liability may play a certain limited role as well. Persons who have suffered damage through the malfunction of a global navigation satellite system may partly be able to claim compensation under a contract because the envisaged services rendered by systems such as GALILEO will be partly provided on a contractual basis. This will be the case with the special commercial services (CS) to be offered by GALILEO for which also certain fees must be paid. In case that these services are defective there may therefore lay a claim in contract. A contractual damages claim may also be successfully brought by the buyer of a defective receiver against the seller, at least where the latter is the manufacturer. Finally, the system operator if liable itself, may have a right of redress in contract against suppliers and/or manufacturers of defective components.

However, in general liability in contract is not likely to be of particular importance in case of damage caused by the failure of a global navigation satellite system. Moreover, the widely recognised principle of party autonomy allows the parties to a contract to regulate their relationship themselves with respect to jurisdiction and applicable law and also to a great extent with respect to the material contents of their contract. Tort liability or liability irrespective of any

<sup>10</sup> Micheal G. Faure and Ton Harlief eds. *Financial Compensation for Victims of Catastrophes: A Comparative Legal Approach*. Vienna: SpringerWienNewYork, 2006, 418.

contractual bond will be of much greater importance in the field under review and here for obvious reasons the parties can generally not determine in advance which court shall decide and which law shall apply.

#### *Relationship to existing international conventions*

At present no uniform global liability regime in the kind of an international convention is in place for damages caused by global navigation satellite systems. However, if their malfunction causes, for instance, the loss of lives through air crashes or the pollution of the environment through ship wreckages it is true that international air<sup>11</sup> or maritime conventions<sup>12</sup> may come into play. In the case that due to a satellite system failure an airplane crashes into a nuclear power plant and causes a nuclear incident even the nuclear conventions<sup>13</sup> become applicable.

These conventions deal with the liability of the air carrier, of the ship owner or the operator of the nuclear installation only. They do not deal with the liability of third persons who in turn have caused the air crash or ship wreckage or nuclear incident. Partly, they cover damage caused by the malfunction of global navigation satellite systems, partly they do not. The Convention on Civil Liability for Oil Pollution Damage of 1969, for instance, excludes explicitly the ship owner's liability if "he proves that the damage was wholly caused by the negligence or other wrongful act of any Government or other authority responsible for the maintenance of lights or other navigational aids in the

<sup>11</sup> Convention for the Unification of Certain Rules for International Carriage by Air (Montreal Convention), 28 May 1999; United Nations General Assembly. Convention on International Liability for Damage Caused by Space Objects (Liability Convention), Resolution 2777 (XXVI), 1 Sept. 1972.

<sup>12</sup> The Convention on Civil Liability for Damage from Oil Pollution (Brussels Convention), Brussels, 29 Nov. 1969, as amended by the Protocol of 1992; International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (Fund Convention), Brussels, 18 Dec. 1971; Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (London Convention), London, 3 May 1996; United Nations Economic Commission for Europe, Convention on Civil Liability for Damage Caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels (CRTD), Geneva, 10 Oct. 1989; Convention on Civil Liability for Bunker Oil Pollution Damage (Bunkers Convention), London, 23 Mar. 2001.

<sup>13</sup> Convention on TPL in the Field of Nuclear Energy (Paris Convention), Paris, 29 July 1960, with amending Protocols (in force in 15 States); Convention on Civil Liability for Nuclear Damage (Vienna Convention), Vienna, 21 May 1963, with amending Protocols (in force in 35 States); the Convention on Supplementary Compensation for Nuclear Damage, 12 Sept. 1997 (not yet in force).

exercise of that function.”<sup>14</sup> Damage through a state-run GNSS as a ‘navigational aid’ would therefore not fall under this Convention.

On the other hand, the Nuclear Conventions channel liability exclusively onto the operator who then is the only person whom victims can sue.<sup>15</sup> The Nuclear Conventions do not exclude GNSS caused nuclear damage. Furthermore, the mentioned Conventions and further additional instruments safeguard that the liable person provides for appropriate insurance coverage and that further (public) funds become available. Where these instruments are applicable and where they cover liability for damage even through GNSS failures there is no need for further protection of victims. However, the scope of the mentioned Conventions is limited insofar as only a limited number of countries has ratified them and by far not all cases are covered where the malfunction of a global navigation satellite system may possibly cause damage. Then it becomes necessary to determine the competent court and the applicable law according to the various and diverse national, sometimes regional rules of private international and procedural law.

### 2.1.3. Problems of the present situation

The following part gives a short account of the legal problems posed by the present state of affairs in regard of liability for damage caused by failures of satellite-based information systems and the solutions which the present state of law provides. This part is based on the assumption that state or European Community authorities run or will run these systems and bear the overall responsibility, that even the ground stations are or will be operated by state or Community authorities and officials, and that private enterprises are or will only be involved as manufacturers of specific components of the system.

On the basis of these assumptions legal problems arise on five different levels: first, the level of possible state immunity; second, the level of international jurisdiction; third, the level of the determination of the applicable law; fourth the level of the application of the determined national law; fifth, the recognition and enforcement of

<sup>14</sup> Brussels Convention Art. III (2) (c); London Convention Art. 7 (2) (c).

<sup>15</sup> Paris Convention Art. 3 and Art. 9; Vienna Convention Art. IV.

judgments. I will deal with them in that order.

### 2.1.4. State immunity

#### *The legal basis*

As far as state authorities provide the services of the global navigation satellite systems it is questionable whether they can invoke the defence of state immunity when sued in foreign courts. Actually, two international conventions on state immunity – the Basle Convention on State Immunity of 1972 and the UN Convention on Jurisdictional Immunities of States and Their Property of 2004 – provide general rules for this issue.<sup>16</sup> However, the Basle Convention is in force in a limited number of states only<sup>17</sup> and can hardly be taken to represent the current global solution, and the UN Convention is not yet in force at all. Therefore, the international customary law on state immunity has to be applied which is however more or less mirrored and thus to a great deal evidenced by the mentioned Conventions.

#### *Immunity of the EU*

A first question would be whether the European Community as such being the responsible organiser of GALILEO could enjoy immunity like a single state in the courts of countries outside the EU.<sup>18</sup> The view prevails that the Community – in parallel to international organisations – enjoys immunity to the same extent as its Member States.<sup>19</sup> This understanding is however not yet reflected by the definition of the term “state” in Art. 2(1)(b) UN Convention on

<sup>16</sup> But it should be noted that certain international conventions on specific matters also deal with the issue of state immunity and prevail over the two general Conventions on state immunity. Examples are again the Nuclear Conventions: Paris Convention Art. 13 (e) and Vienna Convention Art. XIV.

<sup>17</sup> The Council of Europe European Convention on State Immunity (Basle Convention: CETS No. 72), 16 May 1972, is only in force in Austria, Belgium, Cyprus, Germany, Luxembourg, The Netherlands, Switzerland and the United Kingdom.

<sup>18</sup> Inside the EU sovereign acts of the Community or its institutions and organs can be attacked in accordance with the provisions of the EC Treaty.

<sup>19</sup> Simma, Brunno and Vedder, Christoph in: Grabitz, Eberhart and Hilf, Meinhard eds., Das Recht der Europäischen Union. Looseleaf, October 2007, Art. 281 EGV no. 17 et seq. with numerous references. The same distinction can be found in international conventions on specific subjects. An example is the Convention on Liability and Compensation for Damage in connection with the Carriage of Hazardous and Noxious Substances by Sea of 1996. Its Art. 4 (6) prescribes that “(w)ith respect to ships owned by a State Party and used for commercial purposes, each State shall be subject to suit in the jurisdictions set forth in Article 38 and shall waive all defences based on its status as a sovereign State.”



## Jurisdictional Immunities of States and Their Property of 2004.

### *Immunity for sovereign acts*

According to international customary law on state immunity which has been also adopted by the two above-mentioned Conventions it is decisive whether the state acted as state (*acta jure imperii*) or like a private person (*acta jure gestionis*).<sup>20</sup> For acts of the latter kind the defence of state immunity is not available while for the former it is. As far as immunity is granted it extends not only to the respective state or, in case of the EU, to the Community but also to state or Community agencies “performing acts in the exercise of sovereign authority.”<sup>21</sup>

Due to the prevailing view the borderline between the two kinds of state activities must be determined according to the objective character of the activity.<sup>22</sup> It therefore depends on the nature of the transaction but also on the purpose for which a state-run infrastructure such as GPS, GLONASS or GALILEO is used. For instance, GALILEO will serve different aims with various programmes. Therefore, for each of these programmes the question of state immunity must be answered separately: for the commercial service (CS) it is rather certain that the Community cannot invoke immunity. For the rescue service (SoL) and similar specialised services for the police etc it is on the contrary rather likely although not certain that the Community would enjoy immunity in the courts of other countries when the system’s failure causes damage. For, the provision of rescue services serves purposes whose performance is regularly and primarily a public task even though private organisations may also provide rescue services. For the open service (OS) which benefits the public at large it is rather uncertain whether or not immunity would be granted. Courts of different countries may decide differently on this matter.

<sup>20</sup> Brownlie, Ian. *Principles of Public International Law*. New York: Oxford University Press, 2003, 335 et seq.; Stein, Torsten and Von Buttlar, Christian. *Völkerrecht*. Heijmans, 2005, no. 717 et seq.

<sup>21</sup> See the definition in Art. 2 (2) UN Convention on Jurisdictional Immunities of States and Their Property; in the same sense, supra 9, Basle Convention Art. 27.

<sup>22</sup> The express definition is given in the UN Convention on Jurisdictional Immunities of States and Their Property, Art. 2 (2); further for instance German Federal Constitutional Court (Bundesverfassungsgericht – BVerfG) Entscheidungen (BVerfGE) 16, 27; BVerfGE 46, 362; Stein, Torsten and von Buttlar, Christian, no. 719. Specific Immunity Acts which some states have introduced follow the same line: see, e.g., the US-Foreign Sovereign Immunity Act (sect. 1603 (d) where ‘commercial’ acts are defined).

## *Doubtful exclusion of damage claims from immunity*

Both the Basle Convention and the UN Convention on state immunity prescribe that a Contracting State cannot invoke immunity when being sued for damage done to a person in another Contracting State if the damage is attributable to the (first) State and if the author of the damage was present in the (second) State when the damage was done.<sup>23</sup> It is questionable whether this rule constitutes already a rule of international customary law. In any event it will be rare that its requirements are met in cases here under discussion.

### *Summary*

In sum, the current rules on state immunity are not free from uncertainties. Persons who have suffered damage through the malfunction of a global navigation satellite system such as GPS, GLONASS or GALILEO have to bear a considerable risk that the operating state or the operating Community or its respective agency cannot be made liable outside their home state because of the defence of state immunity.

#### **2.1.5. International jurisdiction**

##### *Legal basis*

As indicated, the court competent to hear a damages claim must be determined separately with respect to each possible defendant. The applicable jurisdiction rules may then be either part of international instruments (international conventions but also EU-Regulations) or they may be the autonomous national rules. However, jurisdiction rules of international conventions in special fields can be left aside because these conventions do not yet cover liability for damage through satellite-based services. But regionally harmonised jurisdiction rules may apply: this is the case in Europe where the EC-Treaty provides for some special jurisdiction rules and where the EU Regulation 44/2001/EC on Jurisdiction and the Enforcement of Judgments in Civil and Commercial Matters (Brussels I Regulation),<sup>24</sup> with its predecessor, the Brussels Convention

<sup>23</sup> “United Nations Convention on Jurisdictional Immunities of States and Their Property” (General Assembly Resolution 59/38, Annex), 2 Dec. 2004, Art. 12; supra 9, Basle Convention Art. 11.

<sup>24</sup> EU Council, Council Regulation on Jurisdiction, recognition and enforcement of judgments in civil and commercial matters (Brussels I Regulation), (EC) 44/2001, 22 Dec 2000, ([2001] OJ L 12/1) is directly applicable in all EU Member States except Denmark.

of 1968<sup>25</sup> on the same matters, and with the Lugano Convention of 1988<sup>26</sup> (as well on the same subject) establishes a general framework. This Brussels-Lugano-regime provides rules also on jurisdiction for law suits for the compensation of damage. These rules bind however only the courts within the territorial scope of the Brussels-Lugano-regime.

All mentioned instruments and also national jurisdiction rules allow generally the claimant to sue the defendant in the defendant's forum. This is in accordance with the worldwide-recognised *maxima actor sequitur forum rei*. A competent court is therefore at least located at the place of the defendant's seat or domicile. This would mean that each member in the chain of supply of the satellite-based services can be, and often has to be, sued at its seat. However, this basic rule is further refined by additional jurisdiction rules.

#### *Jurisdiction for claims against the EU*

There are specific jurisdiction rules for damages claims against the European Community even if the damage is done by officials or agencies of the EC.<sup>27</sup> If such a claim is based on a contract which contains a jurisdiction clause conferring jurisdiction on the European Court of Justice then according to Art. 238 EC-Treaty the ECJ is – exclusively<sup>28</sup> – competent. The proceedings must then be instituted in Luxembourg. Without such a jurisdiction clause the national provisions on jurisdiction apply (Art. 240 EC-Treaty). In the EU Member States the Brussels I Regulation provides for jurisdiction in contract matters at the seat of the Community in Brussels<sup>29</sup> and at the place where the services were or should have been provided.<sup>30</sup> It is rather likely that the commercial services (CS) of GALILEO are regularly provided at the client's (and claimant's) seat or domicile where the signals will most likely be received for further use. Claimants may then choose between the different competent courts.

<sup>25</sup> The Brussels Convention still applies with respect to Denmark.

<sup>26</sup> This Convention is applicable in most of the EU Member States and also in Iceland, Norway and Switzerland.

<sup>27</sup> Karpenstein, Ulrich. In Grabitz, Eberhart and Hilf, Meinhard eds., *Das Recht der Europäischen Union*. Looseleaf, October 2007, Art. 238 EGV no. 8 et seq.

<sup>28</sup> Karpenstein, Ulrich. In Grabitz, Eberhart and Hilf, Meinhard eds., *Das Recht der Europäischen Union*. Looseleaf, October 2007 Art. 238 EGV no. 13.

<sup>29</sup> Following the Brussels I Regulation Art. 2 and 60. Brussels is also to be regarded as the regular seat of EU agencies which perform the activities of the EU.

<sup>30</sup> Brussels I Regulation Art. 5 no. 1 2. indent.

Courts in countries outside the Brussels-Lugano-regime follow their own jurisdiction rules which for contract matters may also allow proceedings at the place of performance.

Special jurisdiction rules apply, too, for tortious damages claims against the EU. According to Art. 235 and 288 (2) EC-Treaty the European Court (the Court of First Instance) is competent to decide on such claims if the damage was caused through the exercise of the Community's powers and violated a right of the claimant.<sup>31</sup> Again, the Court's jurisdiction is exclusive.<sup>32</sup> And again, courts in countries outside the Brussels-Lugano-regime would apply their own jurisdiction rules on tort claims (see further below under *iv.*).

#### *Jurisdiction for contract claims*

For all other contract claims (except the discussed claims against the EU) the general jurisdiction rules apply. Within the Brussels-Lugano-regime the courts of the country are competent where the defendant is domiciled (which means at the seat of the service provider)<sup>33</sup> or where the services were or should have been rendered, provided that these places are located in Member States of the Brussels-Lugano-regime.<sup>34</sup> The claimant can choose between the different courts. Outside the Brussels-Lugano-regime the national procedural laws generally allow proceedings at the defendant's seat, and often as well at the place of performance or at a place with which even less contacts exist.<sup>35</sup> Again, the claimant may choose between the competent courts.

#### *Jurisdiction for tort claims*

Also with respect to tort claims the Brussels-Lugano-regime allows the victim a choice of forum: the victim is entitled to sue either in

<sup>31</sup> Art. 288 (2) of the EC Treaty does not mention the requirement that a right of the claimant must have been infringed but the European Court of Justice (ECJ) has constantly interpreted the provision in this sense: e.g. European Court of Justice, C-55/90, *Cato*, ECJ [1992] ECR I-2533.

<sup>32</sup> For instance European Court of Justice C-101/1978, *Granaria*, ECJ [1979] ECR 623.

<sup>33</sup> Brussels I Regulation Art. 2; Brussels Convention Art. 2 and Lugano Convention Art. 2.

<sup>34</sup> Brussels I Regulation Art. 5 (1) (2); Brussels Convention Art. 5 (1); Lugano Convention Art. 5 (1); the place of performance has still to be determined according to the applicable law; for further discussion see Mankowski, Peter in Magnus, Ulrich and Mankowski, Peter eds. *Brussels I Regulation*. Sellier: European Law Publishers, 2007, Art. 5 no. 128 et seq.

<sup>35</sup> See in particular the so-called long arm statutes of several US States.



the courts of the country where the defendant is domiciled<sup>36</sup> or where the harmful event occurred<sup>37</sup> or threatened to occur.<sup>38</sup> The place where the harmful event occurred includes both the place where the tortfeasor/operator acted and where the victim suffered the harm.<sup>39</sup> Are these places located in different countries (which however must be Member States of the Brussels-Lugano-regime) the defendant may also choose between the courts of these countries.<sup>40</sup>

Outside the Brussels-Lugano-regime the national rules on jurisdiction for tort claims vary considerably from country to country. The respective rules in the United States, Russia and India may suffice here as examples. In the United States the jurisdiction of civil courts falls within the competency of the single states. They accept the international jurisdiction in tort cases generally if the defendant has acted in the country of the forum<sup>41</sup> but also, if intended or reasonably foreseeable effects of damaging conduct occurred, when committed outside the forum state.<sup>42</sup> Thus, rather transient contacts can suffice to found the international tort jurisdiction of US courts. Instead, the claimant can always sue the defendant at the latter's domicile. In Russia the claimant is entitled to choose among the courts either at the defendant's domicile, at the place where the tort was committed or where the damage was suffered.<sup>43</sup> In India the defendant can be

sued in the courts at its residence but also where the tort was committed.<sup>44</sup>

### Summary

The survey shows that the determination of the competent court is not without complications. On the one hand claimants have very often an option where to sue the defendant: either at the latter's domicile, at the place where the damaging conduct was committed, or where the damage was suffered if all these places are not located in the same state. On the other hand in cases of damage caused by the malfunction of global navigation satellite systems it will often be difficult to locate the place of damaging conduct in a certain country either because the precise cause of the malfunction may remain unclear or, if it is the malfunction of a satellite, there is no place of conduct in a certain state.

Nonetheless, the present legal situation allows claimants regularly forum shopping which is accepted in the interest of victims. But in cases of disastrous damages and at the same time limited funds of the defendant(s) the possibility of forum shopping might adversely affect all victims' interests because a race to the courthouse in each country where damage was suffered would be highly likely. And the first claimant would be probably served best in terms of full compensation. On the other hand for the possible defendants, in particular the service providers, would it be difficult to foresee and take precautions for the situation of being sued in many different countries. Also the litigation costs for the defendant(s) would be multiplied and would reduce the available funds. A 'procedural channelling' concentrating all actions arising from one incident in one court – as is known for instance in international nuclear law conventions<sup>45</sup> – could be an alternative.

### 2.1.6. Determination of the applicable law

#### General considerations

Not only does the determination of the competent court(s) pose problems. Once the competent court is seized with the case it must determine the applicable law if the dispute has a foreign element which in the cases under review is rather the rule than the exception due to the global effects of global

<sup>36</sup> Brussels I Regulation Art. 2; Brussels convention and Lugano Convention.

<sup>37</sup> Brussels I Regulation Art. 5 (3); Brussels convention and Lugano Convention.

<sup>38</sup> Brussels I Regulation Art. 5 (3).

<sup>39</sup> European court of Justice, C-21/76, *Handelswerkerij G.J. Bier v Mines d'Alsace de Potasse*, ECJ [1976] ECR 1735.

<sup>40</sup> European Court of Justice, C-21/76, *Handelswerkerij G.J. Bier v Mines d'Alsace de Potasse*, ECJ [1976] ECR 1735; In the exceptional case that a claimant should have suffered damage in different (Member) State it is likely that the so-called 'Shevill' doctrine would apply. According to this doctrine the claimant can claim compensation in tort in each state only to the extent to which damage in the respective state ensued. Compensation for all damage suffered can only be claimed at the defendant's domicile, European Court of Justice C-68/93, *Shevill v Press Alliance SA*, ECJ [1995] ECR I-415.

<sup>41</sup> Supreme Court of the United States (1980), 444 US 286, 100 S. Ct. 559, *World-Wide Volkswagen Corp. v Woodson*; § 27 Restatement Second on Conflict of Laws.

<sup>42</sup> See, e.g., *Kaiser Aetna v I.C. Deal*, 86 Cal. Ap. 3d 896; 150 Cal. Rptr. 615 (1978); *Moon Carrier v Reliance Insurance Col*, 153 N.J. Super. 312, 379 A. 2d (1977); see further § 37 Restatement Second on Conflict of Laws.

<sup>43</sup> The Arbitration procedural Code of the Russian Federation Art. 247 (the Code of procedure for commercial cases).

<sup>44</sup> Civil Procedure Code of India Sec. 19 and Sec.20; Paras Diwan. *Private International Law*, New Dehli: Deep & Deep Publications, 1993 (3<sup>rd</sup> edition), 569 s.

<sup>45</sup> Paris Convention Art. 13; Vienna Convention Art. XIV.

navigation satellite systems and the likewise global effects of their malfunction.

Like the jurisdiction rules also the choice of law rules for the determination of the applicable law requires to distinguish between contract and tort claims. Though there are no conventions on a global level which unify the choice of law rules for these matters there do exist some relevant regional instruments of unification: for the – here less important – field of contracts the Rome Convention of 1980 and its successor, the Rome I Regulation,<sup>46</sup> as well as the Inter-American Convention on the Law Applicable to International Contracts of Mexico, 1994,<sup>47</sup> and for the field of tort law the Rome II Regulation.<sup>48</sup> Outside the scope of these instruments the various and rather diverse national conflicts rules have to be applied.

#### *Conflicts rules for contracts*

Both international instruments<sup>49</sup> and national conflicts rules<sup>50</sup> regularly allow the parties of an international contract to choose the applicable law. In the absence of any choice differing solutions are provided. The Rome Convention and Rom I Regulation provide for the law at the place of the party which renders the characteristic performance.<sup>51</sup> Under the Convention of Mexico “the contract shall be governed by the law of the State with which it has the closest ties.”<sup>52</sup> The closest ties must be determined taking into account all objective and subjective elements of the contract and the general principles of international commercial law.<sup>53</sup>

National conflicts rules determine the objectively applicable contract law partly also by redress to the seat of the characteristically performing party,<sup>54</sup> partly by applying a multi-factor approach which groups and weighs all relevant contacts,<sup>55</sup> partly by

<sup>46</sup> The Rome I Regulation is still a draft but it will be finally concluded in the next months and will probably enter into force in 2009.

<sup>47</sup> As yet, this Convention is only in force in Mexico and Venezuela.

<sup>48</sup> The Rome II Regulation entered into force in the EU Member States (except Denmark) on 11 January 2009.

<sup>49</sup> The European Economic Community “Convention on the Law Applicable to Contractual Obligations” („Rome Convention”), 19 June 1980 (80/934/EEC), Art. 3; Rome I Regulation Art. 3; The “Inter-American Convention on the Law Applicable to International Contracts” („Mexico Convention”), Mexico 17 March 1994, Art. 7 and 8.

<sup>50</sup> See for example the Civil Code of the Russian Federation Art. 1254..

<sup>51</sup> Rome Convention Art. 4 and Rome I Regulation Art. 4.

<sup>52</sup> Mexico Convention Art. 9.

<sup>53</sup> Ibid.

<sup>54</sup> Civil Code of the Russian Federation Art. 1255.

<sup>55</sup> E.g. the law of the single US States: see, e.g., Art. 3537 Civil Code of Louisiana (which codified this approach).

taking the law of the place of performance<sup>56</sup> or of the place where the contract was concluded.<sup>57</sup>

#### *Conflicts rules for tort claims*

On a regional level the Rome II Regulation designates “the law of the country in which the damage occurs” as generally applicable to international torts<sup>58</sup> but knows also of more specific rules on product liability<sup>59</sup> and environmental damage.

On the level of national conflicts rules again a broad variety of solutions encounters. A widely accepted general principle designates the law of the country where the incident occurred (*lex loci delicti*). But the place of the tort may be either where the tortfeasor acted<sup>60</sup> or where the victim suffered damage. Partly, the tort must be actionable both in the country where it was committed and where it was sued upon.<sup>61</sup> In particular in the United States it is decisive with which country the tort and the parties are most closely connected.<sup>62</sup> This has to be determined by weighing all relevant factors, in particular the place of the injury, the place of the tortious act, domicile, residence, nationality, place of business,<sup>63</sup> but also other factors like the relevant policies of the forum, justified expectations of the parties etc.<sup>64</sup>

#### *Summary*

In cases of damage caused by the malfunction of global navigation satellite systems it will often if not regularly be necessary to designate the applicable law

<sup>56</sup> e.g. Civil code of the Socialist Republic of Vietnam Art. 834 (2).

<sup>57</sup> See as examples which represent many others: Art. 19 Egyptian Civil Code; Art. 7 Japanese Horei..

<sup>58</sup> Rome II Regulation Art. 4 (with the exception that the law of the common habitual residence and a more closely connected law take precedence).

<sup>59</sup> Rome II Regulation Art. 5, mainly the law of the country where the product was marketed.

<sup>60</sup> In China: General Principles of Civil Law § 146(1); further Young, IPRax 1993, 343 et seq.; Xu Guojian, ICLQ 1991, 684 et seq.; in Russia: Civil Code of the Russian Federation Art. 1219(1). Both rules have include exceptions.

<sup>61</sup> e.g., India (which still follows the former English rule of double actionability): The Kotah Transport Ltd. v. The Jhalawas Bus Service Ltd., 1960 Raj.224; further Paras Diwan, Private International Law (supra fn. 50) 551 et seq., 570.

<sup>62</sup> e.g., Babcock v Jackson, 191 N.E. 2d 279 (N.Y. 1963); Reich v. Purcell, 432 P. 2d 727 (Cal. 1967); further Rosenberg, Maurice, Hay, Peter and Weintraub, Russel J. Conflict of Law. Cases and Materials. The Foundation Press Inc.: 1996 (10<sup>th</sup> ed.) et seq.; Scoles, Eugene. F. and Hay, Peter. Conflict of Laws. Minnesota: West Publishing, 1994 (2<sup>nd</sup> ed. Suppl. 1995) 570 et seq.; also Restatement Second on Conflict of Laws § 145 (1).

<sup>63</sup> Restatement Second on Conflict of Laws § 145 (2).

<sup>64</sup> Restatement Second on Conflict of Laws § 6 (2).



according to the rules of private international law. With few exceptions of limited harmonisation this law is mainly national law and varies from country to country. Even the brief survey presented above shows a rather great variety of different conflicts rules when such damage has been caused. First, the conflicts rules for contract and tort claims differ. Second, even though the starting point for international tort claims is often the *lex loci delicti* principle there are many variations and exceptions to that rule. It is clear that in some cases the different conflicts solutions do not lead to the same law but produce differing results in this respect and promote thereby forum shopping. Not infrequently it is also rather unpredictable which law will finally govern a given case since many national laws grant the judge a rather wide discretion to designate the applicable law. In cases of international or even global mass disasters of the kind envisaged here the present system of private international law answers inappropriately to the challenge that like cases should be treated alike.

#### 2.1.7. Diverse substantive laws

##### *General considerations*

The few conventions left aside which in certain specific situations may already cover damage caused by global navigation satellite systems<sup>65</sup> national contract and tort law has finally to be applied to claims concerning such damage. It is neither possible nor necessary here to give a full comparative account of the national contract and tort laws. Few remarks may suffice.

##### *Claims in contract*

A damages claim in contract generally requires a breach of contract, a damage and causation between both. Differences between national laws exist as to the requirement of fault; while some systems require fault, others provide for strict liability with certain excuses.<sup>66</sup> With respect to contracts for services the fault principle may prevail. Sometimes, national law even expressly implies a contract term that the service provider "will carry out the service with reasonable care and skill"<sup>67</sup> thereby adopting a fault standard.<sup>68</sup> In contract there is a

<sup>65</sup> Supra VI. 3.

<sup>66</sup> Comparative observations can be found in Markesinis, Basil S., Unberath, Hannes and Johnston, Angus C. *The German Law of Contract*. Oxford: Hart Publishing, 2006, 444 et seq.

<sup>67</sup> Sale and Supply of Goods Act 1982, sec. 13 (English)

<sup>68</sup> Markesinis, Basil S., Unberath, Hannes and Johnston, Angus C. *The German Law of Contract*. Oxford: Hart Publishing, 2006, 445 et seq.

tendency to place the burden of proof on the debtor who must prove that he acted with reasonable care and skill.<sup>69</sup> Major differences between the legal systems exist with respect to the extent of damages in contract although the principle of full compensation is generally the common starting point.<sup>70</sup>

##### *Claims in tort*

The general tort law is most frequently based on four requirements: damage (partly limited to certain protected interests such as life, body, property etc); wrongfulness (breach of a duty); fault and causation. Generally the claimant bears the burden of proof of all these elements. If these requirements are met then full compensation (*restitutio in integrum*) is owed. However, the single elements are not everywhere understood in the same sense and applied in a uniform sense.<sup>71</sup>

Regularly this basic liability scheme is supplemented by strict liability statutes or precedents which dispense with fault in cases of specific activities which are unusually dangerous or place unreasonable risks on possible victims. Under strict liability only few grounds of exoneration are recognised.<sup>72</sup> The rather widely accepted example of strict product liability,<sup>73</sup> however, may be already on the retreat in some parts of the world.<sup>74</sup> Partly the courts are given discretion, and partly they are not permitted, to extend strict liability statutes by way of analogy.<sup>75</sup> Partly those statutes provide for maximum amounts for damages. Rather far-reaching variations between the different legal systems concern the compensable heads of damage under tort

<sup>69</sup> Magnus, Ulrich and Micklitz, Hans-Wolfgang eds. *Liability for the Safety of Services*. Nomos, 2006, 517.

<sup>70</sup> See the comparative observations by Markesinis, Basil, Hannes, Unberath and Angus, Johnston. *The German Law of Contract*. Oxford: Hart Publishing, 2006, 479 et seq.

<sup>71</sup> See the broad comparative studies on the single elements: Koziol, Helmut eds. *Unification of Tort Law: Wrongfulness*. The Hague: Kluwer Law International, 1998; Spier, Jaap eds. *Unification of Tort Law: Causation*. The Hague: Kluwer Law International, 2000; Magnus, Ulrich eds. *Unification of Tort Law: Damages*. The Hague: Kluwer Law International, 2001; Widmer, Pierre eds. (ed.) *Unification of Tort Law: Fault*. The Hague: Kluwer Law International, 2005.

<sup>72</sup> For a comparative survey see Koch, Bernhard, A. and Koziol, Helmut eds. *Unification of Tort Law: Strict Liability*. The Hague: Kluwer Law International, 2002, 395 et seq.

<sup>73</sup> European Court of Justice C-203/99 *Henning Veedfald v Århus Amtskommune*, ECJ [2001] ECR I-3569; European Court of Justice, C-402/03 *Skov Æg. v Bilka Lavprisvarehus A/S and Bilka Lavprisvarehus A/S v Jette Mikkelsen, Michael Due Nielsen*, ECJ [2006] ECR I-00199.

<sup>74</sup> In the United States design defects and warnings defects are mainly subjected to negligence standards: see § 2 Restatement (Third) of Torts: Product Liability (1998).

<sup>75</sup> Koch, Bernhard, A. and Koziol, Helmut eds. *Unification of Tort Law: Strict Liability*. The Hague: Kluwer Law International, 2002, 395 et seq.



law,<sup>76</sup> in particular with respect to environmental damage. Some countries, in particular the United States, allow even for punitive damages.

With respect to damage caused by the malfunction of a global navigation satellite system it is likely that most countries would require fault for the provider's liability. Principles of strict product liability would however cover cases where defects of the hard-ware were the cause of damage.

#### Evaluation

The national solutions concerning liability for damage caused by satellite-based service activities such as those here under review vary considerably. This fact will lead to differences in compensation. Depending on the applicable substantive law some victims will receive less or no damages than others for like losses.

#### 2.1.8. Recognition of judgments

A further aspect deserves short mentioning, namely the recognition and enforcement of judgments which have been rendered on claims for the compensation of damage caused by the malfunction of global navigation satellite systems. It is an aspect of rather high practical importance. If such judgments cannot be recognised and enforced in other countries in particular where the defendant's assets may be located then the whole exercise of instituting proceedings and gaining a judgment would be frustrated.

At present, no global instrument regulates the international recognition and enforcement of judgments in a general way. Some specialised conventions such as the Nuclear Conventions<sup>77</sup> deal however also with this aspect and provide for recognition and enforcement of judgments in the Contracting States. Further, a number of bilateral treaties concerning the matter and some states still recognise foreign judgments only on this basis.<sup>78</sup> But regularly, this issue must be dealt with according to national and sometimes regional regulations applicable in the country where recognition and enforcement is sought.

On a regional level the Brussels I Regulation provides for the recognition and enforcement of Member State judgments. Judgments

<sup>76</sup> For a comparison see Magnus, Ulrich eds. *Unification of Tort Law: Damages*. The Hague: Kluwer Law International, 2001, 185 et seq.

<sup>77</sup> Paris Convention Art. 13 (e); Vienna Convention Art. XII.

<sup>78</sup> This had been the prior Russian practice.

rendered in one Member State have to be recognised and enforced in all other Member States unless few grounds like *ordre public* or failure of service allow rejecting recognition.<sup>79</sup> As far as the Brussels Convention and the Lugano Convention apply they contain almost identical rules and serve the same purpose as the Brussels I Regulation.

On the national level a variety of solutions encounters. Regularly, the judgment must be final and conclusive, rendered by a competent court and must not offend the *ordre public*. But partly reciprocity is further required.<sup>80</sup> Sometimes also any conflict with internal law hinders recognition.<sup>81</sup> Rather often it is further required that the defendant had been given proper notice of the suit and the opportunity to be heard.<sup>82</sup>

The short survey shows again a considerable variety of solutions which may have the consequence that judgments can be neither recognised nor enforced in countries where they were not rendered. In case of global activities with global effects this is an unfortunate outcome.

#### 2.1.9. Shortcomings of the present solutions and consequences

At the outset it has to be stated that services based on global navigation satellite systems – despite their great and undeniable advantages – carry a certain potential to cause in worst cases tremendous damage. Possible victims should be satisfactorily protected against this risk. The present legal framework allows a certain protection of possible victims but the current solution suffers also from some significant shortcomings:

- The main operators of global navigation satellite systems are and will be states or the European Community. To some, not entirely certain extent they can invoke the defence of state immunity so that they cannot be sued in foreign courts. This is a

<sup>79</sup> Brussels I Regulation Art. 34, Art. 35, Art. 45. Again, Denmark is not bound by these provisions of the Regulation but by the respective rules of the Brussels Convention.

<sup>80</sup> See for instance the Civil Procedure Law of the People's Republic of China of 9 April 1991, Art. 266 and Art. 268 and thereon Jing-ping, in: Paley, Gregory, S. *International Recognition and Enforcement of Money Judgments*, 1994, no. 403.001 et seq.; probably also for Russia: Supreme Court of the Russian Federation, 7 June 2002, IPRax 2003, 356 et seq. (in German translation).

<sup>81</sup> E.g. India: see Code of Civil Procedure sec. 13; for further discussion Sarkar, Subodh Chandra, Sarkar, Prabhas Chandra and Sarkar, Sudipto. *The Law of Civil Procedure*, 10<sup>th</sup> ed., 2004, 159 et seq.

<sup>82</sup> e.g. US: see § 98 Restatement Second on Conflict of Laws.



disadvantage for potential victims outside the operator's state.

- In principle, for each claimant the international jurisdiction must be determined separately with respect to each possible defendant and almost regularly there may be more than one forum where a suit can be brought. The victim can generally choose between the different fora. At first glance this may appear as an advantage for victims because they are often granted the opportunity to sue at the place where the damage was sustained which may be their home country. But in cases of international mass disasters this leads to litigation in many states multiplying the litigation costs of the defendant(s) and reducing the assets available for compensation. Moreover, a just and fair distribution of all assets among all victims cannot be safeguarded. The first claimants have best chances of full compensation. A further disadvantage is the fact that the rules on international jurisdiction and their application are not everywhere clear beyond any doubt. It needs time and money to ascertain their contents and even then claimants may run a certain risk to have approached the wrong court.
- At present it will often, if not regularly be necessary to determine the applicable law according to national or regional conflicts rules when damage is caused through a GNSS malfunction. Due to the different solutions this step may be complicated and may again cost time and money when a victim prepares a claim. Moreover, because courts are frequently accorded certain discretion in determining the applicable law, the outcome is often hardly predictable. The diversity of national or regional conflicts rules has the further consequence that courts of different countries apply different laws to like cases thereby again furthering forum shopping.
- The final success of a claim depends on the contents of the substantive law that is applicable. Here, the national solutions for compensation of damage through GNSS malfunction vary widely. Often no claim will lie when the claimant is unable to prove fault on the part of the defendant. Great differences concern also the recoverable heads of damage and the level of compensation. Not infrequently like cases of damage are treated completely differently in different countries. For victims it may become a kind of lottery whether the applicable

national law is favourable or unfavourable to them.

- The recognition and enforcement of judgments on the compensation of damage through GNSS malfunction in other countries is not always secured. In a considerable number of cases such judgments would not be recognised in other countries. The party favoured by the judgment could not rely on it in the foreign country where for instance the other party may have assets.

In sum, the present rules on state immunity, international jurisdiction, applicable law, substantive liability and compensation as well as on recognition and enforcement of judgments do not altogether exclude victims from compensation in case of damage caused through global navigation satellite systems. But the problems and complexity of these rules make it difficult and in some instances impossible for victims of such damage to receive fair compensation and for defendants to care in advance for the situation that they become liable.

Are these shortcomings serious enough to demand a change of the traditional rules of private international and procedural law according to which liability and compensation for damage in international cases are generally dealt with? The answer depends to some extent on how grave the risks of damage through GNSS malfunction are to be assessed. For certain risks the traditional rules have already been replaced by uniform conventions, in particular for the risk of damage through oil pollution at sea, through nuclear installations, during flight etc. At present the potential damage through GNSS malfunction can be assessed only in a hypothetical way. But as stated already at the outset due to the global effects of global navigation satellite systems there is a potential of extremely high damage which comes close to those risks for which international conventions have been concluded. It may be questioned how likely the entry of such risk in fact would be. But in case of doubt one should follow the precautionary principle and take reasonable steps of precaution in particular if the risk may not materialise frequently but if so may cause tremendous damage.

Consequently, also for the protection against damage through GNSS malfunction a global solution should be sought. It is therefore advocated here that a global convention on civil liability for damage caused through global navigation satellite systems should be concluded.

## 2.2. The Rationale for an International Convention on TPL in Satellite Navigation

by Sergio M. Carbone and Maria Elena de Maestri

### 2.2.1. Premise

The identification of the precise position of persons and objects all around the globe is nowadays a key element for the optimisation of many economical activities, like commercial transport, synchronisation of the communication chains, agriculture, as well as of private activities, like tourism, strengthening safety standards both for people and goods.

The Global Navigation Satellite System has become well known from the very first exploitation of United States' Global Positioning System (GPS), which made use of a satellite-based information for military purposes<sup>83</sup>. Considering that the technical and operational development of GNSS is now well advanced, so that from the initial sole military scope of application nowadays we can envisage a multitude of possible civil uses of this technology, particularly with reference to the transport field, a question concerning the legal issues related to the present and future deployment of this infrastructure must be faced<sup>84</sup>.

<sup>83</sup> In addition to USA GPS, we can mention the Russian GNSS GLONASS, the Indian GAGAN and several initiatives that are under development in order to provide improved navigation services and complement systems. European developments regarding WAAS, EGNOS and GALILEO underline the global nature of GNSS and the need for continued cooperation and complementarities in this field.

<sup>84</sup> See Manzini, Pietro, Masutti, Anna. "An International Civil Liability Regime for the Galileo Services: A Proposal". *Air & Space Law* 33.2 (2008): 114-131.; Von der Dunk, Frans, G. "Liability for Global Navigation Satellite Services: a Comparative Analysis of GPS and Galileo". *Journal of Space Law*, (2004): 429; Poulain, Brunno, "La situation juridique internationale du future service public européen de radionavigation (Galileo)" *L'Europe des transports* (2005): 615; Schubert, Francis, P. "An International Convention on GNSS Liability: When does desirable become necessary?", in *Annals of Air and Space Law*, vol. XXIV (1999), p. 246; Milde, Micheal. "Institutional and Legal Problems of the Global Navigation Satellite System (GNSS): Solutions in Search of a Problem", in *The Utilization of the world's Air Space and Free Outer Space in the 21<sup>st</sup> Century*. Proceeding of the International Conference on Air and Space Policy, Law and Industry for the 21<sup>st</sup> Century, 23-25 June 1997, Seoul, South Korea., Kluwer Law International, 2000, 337.

In fact, at present Global Navigation Satellite Systems are worldwide central both at a commercial and at an institutional level. This means that economic operators are investing in developing the instruments that allow the use of the signal in many applications and, contextually, governments and international organisations (i.e. the International Civil Aviation Organisation, but also European Community institutions) are analysing the current legal framework in order to decide whether such framework is appropriate for handling the specific issues related to this matter or an *ad hoc* discipline is needed.

Effectively, even though the usefulness of such a technology can not be denied, many situations where a failure or defect of transmission of the information may cause loss or damage can be imagined: one may think of an aircraft accident ultimately caused by wrongful or absent navigation information at a critical point in flight operations.

At the moment there is no specific legal framework concerning GNSS activities, therefore liability issues deriving from GNSS malfunction are currently covered by applicable national law. Moreover, considering that those who have suffered damage and those who could possibly be held liable only rarely live in one and the same country, in order to determine which is the applicable domestic law, reference must be made to private international law rules of the State where the action is brought. To this purpose, it is firstly necessary to recall the fundamental threefold distinction between contractual, non contractual and product liability, because of different conflict of law rules applying to these matters<sup>85</sup>. Eventually, if a uniform international convention is in force among the countries involved in the controversy, private international law rule will not be applied in favour of the application of the uniform discipline, except from the aspects that are not ruled by the treaty, for which national conflict of law rules will still apply.

<sup>85</sup> As well known, the difference between the three types of liability stands upon the legal relationship between the claimant and the defendant. In fact, while the contractual liability, as the word says, arises from a contract or agreement, involving thus parties autonomy to define their duties and rights, non-contractual liability would then contemplate damages occurred outside a contractual relationship, such as loss or injuries caused to a third party, and has to be regulated by legislative means. Finally, product liability imposes liability upon the manufacturer or seller of a product by which, in the course of using it, damage has been caused, independently from a contract between them.



This paper will focus on non contractual liability issues connected to the possible multiple applications of the GNSS technology, not analysing the contractual obligations regime. The premise of an exam of the current legal framework should be that, at the moment, relevant tort and TPL regimes not specifically focused on GNSS would nevertheless apply.

### 2.2.2. The present legal framework

Considering the above-mentioned lack of an *ad hoc* discipline connected to GNSS exploitation as well as the real possibility of a damage caused by a system malfunction, it is necessary to outline the present legal framework which should cover liability for such a damage, in order to explain the need of a uniform discipline for all States making use of this technology.

To this extent, it has to be clarified that depending on each field that is involved in the accident (i.e. marine pollution, air crash, bank transactions etc...) and on the transnational dimension of the relationship, different liability rules are going to be applied.

In order to bring an example, we can consider that the first economic sector to acknowledge the potential benefits of global navigation satellite systems was, and still is, the aviation one. In 1983, in fact, the International Civil Aviation Organisation (ICAO) established a Committee on Future Air Navigation Systems (FANS), whose aim was, *inter alia*, to identify possible benefits, risks and drawbacks of the use of global navigation satellite systems for aviation purposes and came forward with recommendations for dealing with it properly. Later the FANS concept evolved into the more encompassing one of Communication, Navigation and Surveillance/Air Traffic Management (CNS/ATM), and a Legal Technical Expert Panel (LTEP) was established to make sure all relevant legal aspects were considered.<sup>86</sup>

Because of the required high degree of safety standards needed in the aviation sector, it quickly became clear that liability was a key issue for the acceptance of the GNSS as a structural component of air traffic services.

Efforts have been made to establish liability for such damage on the basis of the existing

<sup>86</sup> In order to accommodate the possible usage of GNSS, ICAO also drew Standards and Recommended Practices (SARPs) to be followed by all signal providers.

legal framework, referring to international instruments and national laws.

First of all, the Convention on International Liability for damage caused by Space Objects was mentioned, considering the satellite as a "space object" for the purpose of the convention's scope of application<sup>87</sup>, which provides a strict liability regime upon launching States for certain damages caused by a satellite. However, the relevance of this convention is limited, because it establishes an absolute and exclusive liability for launching States, without involvement of any other subject (private or public) interested into the exploitation of the GNSS; moreover, the convention refers to liability only for damage caused "by" space object, which clearly covers the sole direct physical damages, thus excluding any damage other than those physical and caused by the fall of space objects. Finally, also the envisaged system of strict liability does not seem to be the best one for granting adequate compensation for catastrophic events, because the compensation amount would often be not very high, so that an additional granting fund should be set up<sup>88</sup>.

Liability for damages caused by the exploitation of a satellite should be established also on the basis of the Chicago Convention on International Civil Aviation<sup>89</sup>, following which States, on the one side, have complete and exclusive sovereignty over the airspace above their territory and, on the other side, undertake to provide adequate air navigation services, including the relevant air navigation facilities, in accordance with ICAO Standards of Recommended Practices<sup>90</sup>. According to common interpretation of Article 28 of the convention, therefore, participating States are responsible for the services intended to aid air navigation and improve the safety thereof. Moreover, when the convention was signed the reference to air navigation facilities did not include services deriving from systems of satellite global navigation, where a navigation signal is

<sup>87</sup> Convention on International Liability for Damage Caused by Space Objects (Liability Convention: General Assembly Resolution 2777 (XXVI), Annex), Art. 2, states 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." For a definition of the term "space object", see Art. I which includes «component parts of a space object as well as its launch vehicle and parts thereof». See also the exemption clause contained in Art. VII.

<sup>88</sup> To this extent, the best solution would be to set up a two tier system of liability, as the one draw by the Brussels Convention and the Fund Convention.

<sup>89</sup> Convention on International Civil Aviation (Chicago Convention), Chicago, 7 December 1944.

<sup>90</sup> Chicago Convention Art. 1 and Art. 28.

provided all around the globe by transmitters located in a zone where States have no sovereignty: space.

In any case, in granting such services, most States have to rely on signals in space and their augmentation provided by others, today mainly United States, so that a question arises whether the implementation of GNSS should also involve additional arrangements establishing a link between the State providing the signal from space and the State having jurisdiction under Article 28 of the Chicago Convention. To this extent it must be considered that Article 28 does not prevent contracting States from delegating to another State the responsibility for establishing and providing air navigation services<sup>91</sup>, but the responsibility of the delegated State is limited to the technical and organisational aspects.

In any case, responsibility under Article 28 should not be considered the same as liability from the point of view of international law; this rule of law, in fact, regulates the relationship between States only and does not give cause of action to private persons to claim compensation for damage. Such claims should rather be handled at the level of applicable domestic law, European normative instruments and international treaties concerning the substantive matter involved (i.e. aviation)<sup>92</sup>.

Moving forward from the aviation example, there are many types of tort actions that may be relevant for the purposes of analysing GNSS' potential liability, the basic principle of which is, in any case, that the claimant must show that the defendant's wrongdoing caused the actual damage. It, therefore, must be clearly established : i) that a legal duty of care exists; ii) that the defending party did owe to the claimant such a duty of care; iii) that the defending party did indeed breach such a duty of care; iv) that the claimant did suffer damage; and v) that the alleged damage was not caused by the action or inaction of the defendant.

Considering that each State has a different legal framework concerning the extent of the duty of care and recoverability of damages,

<sup>91</sup> Chicago Convention Annex 11, par. 2.1.

<sup>92</sup> Still considering the aviation field as a reference model, we recall the Warsaw Convention of 12 October 1929, concerning international air transports of people, luggage and goods given on compensation; the Montreal Convention for the Unification of Certain Rules for International Carriage by Air, of 28 May 1999, providing for an unlimited responsibility in case of death or injury of airplane passengers; and the Rome Convention of 7 October 1952, on Damage Caused by Foreign Aircraft to third parties on the surface.

and that the applicable law will be determined in accordance with the conflict of law rules of the State where the action is brought, evidently a problem of certainty and clarity of law arises in this field. In the European area this problem has been partially reduced by regulation (EC) n. 864/2007 of 11 July 2007 on the law applicable to non-contractual obligations (Rome II)<sup>93</sup>; this, even though this regulation leaves unaffected the differences among European substantive tort laws, establishing only common conflict rules for non contractual obligations.

Clearly, the main deficiencies of the present framework of the liability regime applicable to GNSS are not only connected to a complete absence of specific substantive provisions concerning these issues or to the absence of compensation channels for all situations, but also to the ambiguous interaction between the possible existing tools which may be used to this purpose. In fact, considering the

<sup>93</sup> European Parliament and EU Council, Regulation (EC) 864/2007 on the law applicable to non-contractual obligations (Rome II), 11 July 2007, (OJ [2007] L 199/40); On this topic see Luzzatto, Riccardo. *Riflessioni sulla c.d. comunitarizzazione del diritto internazionale privato*. in Venturini, Gabriella, Bariatti, Stefania. "Nuovi strumenti del diritto internazionale privato", Liber Fausto Pocar Volume 2. Milano: Giuffrè, 2009, p. 613; Brand, Ronald.A. "Evolving competence for private International law in Europe: the external effects of internal developments." in Venturini, Gabriella, Bariatti, Stefania. *Nuovi strumenti del diritto internazionale privato*., Liber Fausto Pocar Volume 2. Milano: Giuffrè, 2009. 163; Bogdan, Michael. "Some reflections Regarding Environmental Damage and the Rome II Regulation." in Venturini, Gabriella, Bariatti, Stefania. *Nuovi strumenti del diritto internazionale privato*, Liber Fausto Pocar Volume 2. Milano: Giuffrè, 2009, p. 95; Dutoit, Bernard. "Le droit International privé des obligations non contractuelles à l'heure européenne: le Règlement Rome II." in Venturini, Gabriella, Bariatti, Stefania. *Nuovi strumenti del diritto internazionale privato*, Liber Fausto Pocar Volume 2. Milano: Giuffrè, 2009, p. 309; Garofalo, Luciano. "Diritto comunitario e conflitti di leggi. Spunti sulle nuove tendenze del diritto internazionale privato contemporaneo emergenti dal Regolamento Roma II." in Venturini, Gabriella, Bariatti, Stefania. *Nuovi strumenti del diritto internazionale privato*, Liber Fausto Pocar Volume 2. Milano: Giuffrè, 2009, p. 413; Tonolo, Sara. "La nuova disciplina di conflitto delle obbligazioni extra-contrattuali nel Regolamento (CE) Roma II", *Studium iuris* 2008, p. 1; De Lima Pinheiro, Luis. "Choice of Law on Non-Contractual Obligations between Communitarization and Globalization: A First Assessment of EC Regulation Rome II" - La scelta del diritto applicabile alla responsabilità extracontrattuale tra armonizzazione e globalizzazione. *Prime valutazioni del Regolamento Roma II*, in Riv. dir. int. priv. e proc., 2008, p. 5; Munari, Francesco. "L'entrata." in *vigore del Regolamento (Roma II) e i suoi effetti sul private antitrust enforcement*, in Dir. comm. int., 2008, p. 281; Munari, Francesco and Schiano di Pepe, Lorenzo. "Liability for environmental torts in Europe: Choice of forum, choice of law and the case for pursuing effective legal uniformity." - *Responsabilità per danni ambientali in Europa. Scelta del Foro, della normativa e del procedimento giudiziario per perseguire l'effettiva uniformità giuridica*, in Riv. dir. int. priv. e proc., 2005, p. 607.



implications of global navigation systems, with their multimodal dimensions and multiplicity of stakeholders, and focusing on the key issues of clarity and legal certainty, the need for a comprehensive framework is self-evident.

### 2.2.3. The rationale for an international framework

The need for an international comprehensive framework is traditionally strictly connected to the specific risk that characterises a particular activity and to the international scope of the effects of such risk. In this perspective, on the one hand, being GNSS a high technological activity, it has a great risk's factor, principally during the development and first use phases; on the other hand, the multimodal dimension of global navigation systems carries out that the geographical scope of damage caused by a system malfunction is, in principle, not confined within the national boundaries of one State only. In the event of damages in more than one country, therefore, it is desirable that the recoverable amount to be accorded to victims be distributed equitably among all affected persons under the same criteria, irrespective to the country which they belong to, on the basis of mandatory uniform rules.

To this purpose, an international legal framework is the only way to ensure adequate, equitable and uniform compensation for persons who suffered damage. Such framework implies the unification of the basic rules which applies in the different countries to the liability incurred from a specific occurrence, whilst eventually leaving these countries free to take, on a national basis, any additional measures which they deem appropriate<sup>94</sup>.

In this perspective such international legal framework is not aimed at regulating States' relationships, but at giving a substantive discipline of a subject that is in its essence international.

To this extent a debate has developed during ICAO, ECAC and UNIDROIT consultations on the GNSS legal framework's "state of the art". In this context, we can identify three possible approaches to the issue of TPL: i) a strict approach, which considers that the current liability regime under domestic law is perfectly coping with GNSS; ii) a wide

<sup>94</sup> Premises to the Paris Convention on TPL in the Field of Nuclear Energy, the Vienna Convention on Civil Liability for Nuclear Damage and the International Convention on Civil Liability for Oil Pollution Damage.

approach, which deems that a universal liability system or convention should be set up; and iii) a middle ground approach, proposing a contractual approach accompanied by a framework agreement, containing some uniform rules, among which the one concerning liability. Namely we should find two versions of the third middle approach, because some people deem that those common rules should be mandatory for all parties concerned, while other people lean towards a mere recommendation.

### 2.2.4. Continues: the strict approach

As we said the strict approach is focused on the suitability of the present legal framework in managing any liability issue deriving from a malfunction of satellite navigation systems. The reasons behind this thought lay in the fact that today there are only two operating systems (GPS and GLONASS)<sup>95</sup> that are run by two public operators (USA and Russia) mainly for military purpose, even if their signals are available for private and commercial use<sup>96</sup>.

It is therefore said that being the navigation service mainly established for public purposes, it is not a suitable subject for international (private or public) agreements. Following this assumption, considering the double use of the signal, public and private, but with the particular military dimension of the existing technology, it would be hard to imagine that the countries in which these systems have been developed are prepared to expose themselves to an international liability convention that is the outcome of international negotiations and is to a large extent heteronomous. To this purpose it has to be considered that it is true that, at the moment, GPS and GLONASS have mainly a military dimension but, as already said, the GNSS market is growing in a boundless way, affecting all fields where information relating to the precise position of people and goods is necessary and encouraging commercial operators in developing new applications of this technology, so that also the existing systems have developed, or however shall develop, a commercial and civil interest. For example, the provision of navigation services for such an utilisation is already a key element in the aviation sector, where the management of those services is funda-

<sup>95</sup> The European system (GALILEO) is under construction, following its implementation plan it is to be operated from 2013 by a public-private partnership.

<sup>96</sup> Bollweg, Hans-Georg. "Initial considerations regarding the feasibility of an international UNIDROIT instrument to cover liability for damage caused by malfunctions in global (navigation) satellite systems", *Uniform Law Review*, 2009.

mental for the safety standards required by national authorities.

From another point of view, it has been observed that international negotiations for an international regime of GNSS liability issues would be endless, because of the different interests pursued by the various States. In fact, on the one hand signal provider countries would rather support an international regime grounded on limitation of liability and consistent with the insurability of such liability, being such criteria essential pre-requisites for finding private investors and stimulating the presence of private-operating companies in this field, while, on the other hand, end user countries would prefer to have only limited restriction on the liability of the signal provider and, eventually, in case of limitation of compensation, the amount of such regime to be very high.

In order to object to this argument, it is sufficient to observe that all the existing international instruments concerning liability are based on a compromise between these competing interests and a solution has always been found. Effectively, even if the interests brought by signal providers and possible victims of system malfunction are not the same, as well as interests brought by polluters and victims following the CLC Convention, it is proved that the best solution to find adequate compensation in all damage cases is to set up an international regime<sup>97</sup>.

Further criticisms to the effective need of an international liability regime, are argued by the circumstance that in many cases even 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, the latter are nevertheless each linked by contract to the respective prior user and the last prior user to the system operator. Also in this case, therefore, the best solution would be to settle claims in accordance with the contractual chain, where the respective contract determines the existence, the contents and the extent of the respective liability.

However, if we make reference to the possible "catastrophic events" that might occur, such as an airplane crash causing damages to people and goods located in the area of the disaster, it is clear that there are many cases where the injured party is not tied directly or indirectly to contracts leading

to the system operator, so that it would be hard, or even impossible, to find compensation based on contractual liability.

#### 2.2.5. Continues: the middle ground approach, the contractual framework

Being conscious of the abovementioned limits of the existing legal framework to provide a complete and consistent discipline concerning GNSS liability issues, the ICAO Study Group proposed in 2004 a middle-ground approach<sup>98</sup>. Such approach is based on the assumption that "a contractual framework may provide a link between the provider of signals and a State having jurisdiction under Article 28 of the Chicago Convention as regards the terms and conditions, under which GNSS services are provided", also concerning the issue of liability.

The search for uniformity, following this setting, would be achieved by establishing common elements applicable to all contracts that would be negotiated separately among different parties involved in the exploitation of GNSS applications; therefore the framework would coordinate the relationships among different players in various stages of the provision of the GNSS services for the benefit of all subjects which may be injured or damaged by a malfunction of the signals.

The idea of an elaboration of contractual clauses and models is not new in the effort of unifying rules concerning a specific field, and it is based on practitioners' need for certainty which, through the general acceptance of standards there proposed, can assume an "objective" shape, capable of ruling the subject matter concerned and of prevailing also on national laws.

However, it has to be clarified that at the basis of the application of such a contractual discipline there must always be an expression of parties', at least implicit, willingness to be bound to the framework.

Consequently, the first negative aspect of this solution arises from the fact that the nature of the framework agreement is evidently voluntary and based on applicable national law. According to this, in fact, for example the ICAO draft framework 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

<sup>97</sup> The Hague Academy of International Law, Centre for Studies and Research in International Law and International Relations. "The International Aspects of Natural and Industrial Catastrophes." Dordrecht-Boston-London, 1995.

<sup>98</sup> See Final Report on the Work of the Secretariat Study Group on Legal Aspects of CNS/ATM Systems, presented in 2004 to the 35th ICAO General Assembly (ICAO docs. A35-WP/75; A35-WP/125).



its activity» and that «the right of recourse and indemnification of a party may be limited by the proportion of its respective fault, if the applicable law so provides”. It is easy to understand that this kind of assessment will neither improve certainty, nor guarantee adequate compensation to the victims of damages.

Effectively, the middle ground approach comprises two separate and distinct options: a flexible approach and a binding approach. Under the flexible approach just now mentioned, a number of model clauses would be drafted and it would be up to the negotiating parties to decide whether or not to use them in the contract. Under the binding approach, on the contrary, the contractual framework should include a number of mandatory common clauses which should bind all parties. In order to define such mandatory elements, a Framework Agreement among States at governmental level is envisaged, whose nature and binding effect is equivocal and uncertain. However, even though in the ICAO Framework Agreement the liability element is classified as mandatory, the corresponding provision says that “the liability of the parties shall be ruled by the material liability regime normally applicable to its activity, in accordance with applicable existing international and national laws. [...] In the event that loss or damage can be attributed to GNSS failure, malfunction or improper use, but cannot clearly be traced to a specific defendant, the defendants involved in the chain of the events which resulted in the occurrence of the loss or damage shall be declared jointly liable for the entire amount of the loss or damage”.

The propelling idea of such Framework Agreement was also to create a readily available instrument to cover all legal clauses related to the operation of the GNSS, harmonising contractual relationships between the parties involved, and providing legal certainty also for the benefit of any third party injured or damaged from the GNSS malfunction. The Framework Agreement is, therefore, based on a two-tier approach: on one level, it offers a regulatory agreement dealing with public law matters, including liability, on the other level it deals with private contractual arrangements between the various parties involved in the exploitation of the GNSS where a very large degree of autonomy is granted subject to certain mandatory elements determined by the regulatory agreement.

Such a solution does not seem to be sufficiently appropriate for managing third

parties liability issues in a complete and consistent way. The contractual nature comes along with the principle following which a contract concerns only the parties tied to the contract, and does not involve third parties who are totally unaware of the negotiations between the service provider and the signal provider. Evidently, it would be weird to oblige victims of an accident caused by a system malfunction to bring an action in accordance with a contractual scheme to which they were extraneous.

Eventually, as proposed within the same ICAO, the arrangement of such Framework Agreement, accompanied by related contract clauses, could be “an interim solution” between the *status quo* and the long term solution consisting in an international convention. In fact, from a practical point of view, a convention would take longer to put in place than such framework, meanwhile a contractual instrument would not only help to bridge the gap. Moreover a convention would be likely to evolve more smoothly from a workable interim solution.

An example of such an approach can be derived from the evolution of the international discipline of oil pollution<sup>99</sup>, where the entities concerned with the carriage of oil by sea set up a system on voluntary and contractual basis (TOVALOP and CRISTAL) before the drawing and entry into force of an international convention (CLC convention and FUND convention). The reason for the private agreement has been the anticipation of the effects that a uniform regime could guarantee, even in a financial perspective connected to the restoration of damages to the environment.

It has to be noted that even once the convention has been implemented, private agreements may maintain their relevance with a subsidiary role, by extending the scope of application and filling the gaps in the international regime.

#### **2.2.6. Continues: the wide approach, the need for an international convention**

Considering the previous objections to the suitability of the present legal framework relating to GNSS services, and since a great number of States would have to authorise the use of signals over which they have no control, it seems that the only way to secure

<sup>99</sup> Carbone, Sergio M. and Schiano di Pepe, Lorenzo. “Uniform Law and Conflicts in Private Enforcement of Environmental Law: the Maritime Sector and Beyond.” in *Diritto. Martimo*, 2009.



confidence in the system and encourage private bodies to invest in this technology would be to oblige both providers and users to act and operate under a binding international legal instrument, namely an international convention. Such a convention should provide certain and reliable regime to the liability towards third parties not linked by any contractual relationship to the subjects involved in the chain of the signal providing. As a matter of fact, a global operating environment needs global solution through international law instruments.

To this extent, international conventions have the prerogative not only to give a uniform discipline, but also to provide a mandatory regime for situations included in their scope of application, leaving to parties' autonomy only the possibility of extending it<sup>100</sup>, and establishing a clear legal structure imposing rights and duties on parties.

Precisely, one of the reasons that lead to the elaboration of an international convention relates to the fact that, through an international instrument the political trends of national legislators are left apart, as well as the economic pressure exerted by private or public operators in the specific field concerned by the legislative initiative.<sup>101</sup>

Bringing this assumption to the subject concerned, and considering the above mentioned global nature of GNSS technology, the international nature of the subject matter is self-evident; this entails that many different legal orders are virtually implied in the regulation of the phenomenon, each of them setting its own laws and principles based on different political and economic purposes. Facing this scenario, the only way to address States' policies and laws is to set up a uniform international regime, through an interstate agreement, capable of ruling the subject matter independently from national legislators' trends.

<sup>100</sup> In such case a problem concerning the value of the remand will arise. In fact it is doubtful if the will of parties to make the uniform regime applicable to a situation not included in the convention's scope of application makes the international regime binding with reference of all its rules, or whether parties should repeal it in part, as an expression of parties autonomy.

<sup>101</sup> See Carbone, Sergio M. "Accordi interstatali e diritto marittimo uniforme (a proposito di un recente scritto di Natalino Irti)," in *Diritto. Martimo.*, 2008. 351-364; Luzzatto, Riccardo. "Metodi di unificazione del diritto marittimo e interpretazione uniforme." in *Diritto Martimo.*, 1999. 147-152; Carbone, Sergio M. "Il diritto marittimo uniforme nell'ordinamento italiano tra codificazione e decodificazione." *Diritto. Martimo.*, 1999. 94-103; Bariatti, Stefania. *L'interpretazione delle convenzioni internazionali di diritto uniforme*, Padova, Padua: CEDAM, 1986.

Usually the international uniform regulation consists in a compromise between the different national disciplines of a particular field, or however entails a compression of States' legislations by imposing a uniform regulation to the detriment of the substantial interests grounding internal laws, but, in cases where the "internationality" is an intrinsic factor of the subject, the international regime is naturally the most appropriate way to balance all the interests involved; States therefore do not feel to be deprived of their traditions, considered that the specific sector originally wants to be regulated at an international level.

In order to establish a fair discipline, the principles of the international regulation will be driven, firstly, by other international conventions concerning third parties liability that States have ratified, as well as by national principles, without however being dependent on, or influenced by, national legislative frameworks.

The objective of such an instrument is to create a framework of a legal institution out from a specific national legal and political order, grounding it on the principles directly belonging to the international community but obviously derived from national principles. This will provide, on the one hand, the best protection of the involved interests and, on the other hand, certainty concerning the applicable regime, in favour of both the responsible party of, and the damaged persons by, a system malfunction.

To this purpose, a uniform law convention would provide a comprehensive framework for the subject, playing the role usually recognised to national laws for the regulation of a particular legal question, thus providing imperative rules concerning the most relevant issues.

In fact, different imperatives often guide the action of a national legislator, who is directed to set up mandatory rules in order to protect a particular interest, belonging to a precise class of economic operators, thus differing from State to State.

This is the reason why, with reference to TPL in satellite navigation, a proper international convention should manage the charge of the harmful event, the types of damages that can be restored, liability exemption causes, liability limits, the distribution of liability criteria, joint and several liability, the types of liability and right of recourse, establishing common mandatory rules.



Evidently, also at the international level it is not plain to agree on the substantive regulation that has to be achieved, depending on limits to national traditions and social evolution that States are willing to accept in order to find a balance among all the interests involved, and on differences characterising the principles at the basis of a particular legal institution.

With reference to TPL, even though at the international level we can find some common principles (see the existing conventions on the civil liability regime), each State has its own rules concerning the identification of the liable party, the onus of the proof, the quantification of damages' compensation etc.

Moreover, it is a matter of fact that in case of damages incurred by third parties outside of any contractual relation, many international conventions concerning civil liability already grant compensation to the injured party, also in case that the damage is caused by a system malfunction in the satellite navigation; obviously such conventions are connected to a particular field (i.e. oil pollution, transport of nuclear material...), namely to a particular kind of damage, that can interfere with the provision of the signal.

Considering the variety of applications of the GNSS technology, and the consequent variety of international and national regimes that could be applied, we deem that it would be better to set up a convention which protects, in any case, victims of a system malfunction, not leaving to fate the chance of finding an adequate regime of their compensation. In fact, it is not difficult to imagine a situation where a system malfunction causes different damages, i.e., for example, an accident involving ships from which an oil spill derives but also a car crash which damages third parties goods. In such a case, victims of the first kind of damage would benefit from the international uniform regime of liability, while victims of other damages will find compensation only through applicable national law, with all the consequences that this solution implies in terms of compensation amount and evidence rules. At the same time, a unique system malfunction could cause different damages to the same person, who will be obliged to claim compensation to different subjects and following different normative rules.

By unifying liability rules in an international convention, the possibility of uneven deals of damages caused by the same event (i.e. system malfunction/failure) would be avoided, and the peculiarities of the tortious event would be duly taken into consideration.

From a substantive point of view, in order to understand the need for a convention it is necessary to analyse the main problems arising from the existing framework that will be faced by the international instrument.

First of all there is not a common notion of damage "*caused by a system failure or malfunction*"; what in a country can be seen as a consequence of a system malfunction, can be not causally connected to the GNSS system according to another legal system. Moreover, also the characterisation of the responsible party for a system malfunction may be different in each State, depending on the chain of the services' provision.

Another problem arises from the fact that, at present, the services of the global navigation satellite systems are provided by state authorities. This entails an issue related to whether, and to which extent, those authorities can invoke State immunity as a defence, if directly sued in foreign courts by the victims of a system malfunction.

In fact, following international customary law and international conventions<sup>102</sup>, States, States' authorities and States' agencies, can not be sued before foreign courts in relation to *acta iure imperii*, which means whenever a State acts as an Authority, and is not acting as an economic operator, i.e. *iure privatorum*. To this extent it would be fundamental to know if the state-run infrastructure supplies public aims, private activities or both.

Therefore, it is reasonable that when the signal service is provided for military purposes the State immunity rule can be invoked, while when the application has a mere commercial nature also States have to be treated as a common economic operator, that can be sued in order to find compensation for damages caused by a system malfunction. In any case, if the problem of State immunity is not properly regulated, it is easy to forecast that, with reference to GNSS activities, States will try to extend the immunity principle as far as they can, because of the great amount of compensations they otherwise risk to be condemned to pay.

Such a problem is not a new issue in the liability regime, being rather a focal point that is faced through international conventions on different specific matters, which exclude the State immunity exception

<sup>102</sup> UN General Assembly, United Nations Convention on Jurisdictional Immunities of States and Their Property, Resolution 59/38, Annex, 2 Dec. 2004; Basle Convention.

in order to favour the position of the victims. As an example, we can quote the 1960 Paris Convention on TPL in the Field of Nuclear Energy, where at article 13 it is said that “if an action is brought against a Contracting Party under this Convention, such Contracting Party may not, except in respect of measures of execution, invoke any jurisdictional immunities before the court competent in accordance with this Article”, and also Article 14 of the 1992 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, following which “Any State which is bound by a declaration made under this Article shall, in any proceedings brought against it before a competent court in respect of any obligation specified in the declaration, waive any immunity that it would otherwise be entitled to invoke”.

Another problem which arises from the current legal framework concerns international jurisdiction. As we said, the multiplicity of applications connected to the satellite system comes along with the multiplicity of people and goods that could be injured or damaged. Therefore, on the one hand different courts may grant different compensation for the same damage, involving a race to courthouses which ensure higher compensation, giving birth to the well known phenomenon of “forum shopping”; on the second hand, if there is not a uniform liability regime, pointing out who is responsible for the system malfunction, it may also happen that conflicting decisions may occur in which the service provider or the signal provider may or may not be considered as the responsible party for the damage. Moreover, if we consider that the international treaties concerning specific matters usually have a jurisdiction clause which determines the exclusive competence of a specific court, the said inconvenient situation shall be avoided.

With relation to this issue, we can recall what we have already observed in relation to the global effects of global navigation satellite systems and the need for a uniform and mandatory liability regime, through an international convention. We have already indicated that a contractual framework will not provide an answer to this problem, because even if the choice of law clause were binding, each contract would point out a different national law, chosen in the best interest for the parties, which nevertheless is often not the best solution for victims. If the framework agreement behind the contract definitely pointed out a particular national law as the best one for contracts concerning GNSS, other problems would arise: which law

can set the best balance among the various interests involved? Is there a national law which deals with GNSS liability issues? Is it the best solution for victims? Will service providers and signal providers accept this rule?

The above mentioned considerations lead us to confirm that the best solution would be a convention setting up a uniform liability regime, rather than to leave this matter to conflict of laws rules related to GNSS services.

The last aspect that deserves attention concerns recognition and enforcement of judgements ensuring compensation to the victims of a global navigation satellite system malfunction. Evidently if a judgement can not be enforced or even recognised in the country where the assets of the defendant are located, any liability regime would be useless. At present there is no uniform international regime dedicated to this purpose, but at the European level parties could benefit from the Brussels I Regulation, obviously if the matter is included in the regulation scope of application (i.e. civil and commercial matters), that is not plain at present.

Considering the fact that in many cases States would be directly involved in disputes concerning GNSS, and that issues relating to this matter could touch basic principles of a legal system, many situations can easily be imagined where a foreign judgement according compensation to a victim of the system malfunction will not be recognised or enforced.

From the review of the existing legal framework, also the ICAO Study Group proposed a different approach to the problem of liability relating to GNSS, identifying three key elements: i) 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; ii) to establish an adequate recourse action mechanism; and iii) to ensure adequate compensation coverage through compensation fund arrangements, as have been set up in the field of maritime transport and other fields (see nuclear damages convention).

As we already said, ICAO is not fully convinced on the need, at present, for an international convention, but following the



remarks we have just underlined, we deem that ruling in advance for sure a possible dramatic situation will be the best solution, both in order to increase confidence in the new technology and to encourage private investors in developing new applications.

In fact, even though present rules do not altogether exclude victims from compensation in case of damage caused through GNSS, the complexity and the uncertainty of these rules make it difficult or even impossible for victims of such damage to receive fair compensation and for defendants to care in advance for the situation that they become liable.

#### **2.2.7. Which model for a convention on TPL?**

Once explained the considerations at the basis of the need for an international convention on civil liability for satellite-based services, the following step will concern the identification of a model for the draft convention.

First of all, the convention should deal with a uniform substantive law of civil liability related to GNSS services and not with private international law rules. Effectively, it is usual that when a uniform discipline can not be achieved, mainly because of the great differences concerning national substantive laws and the impossibility of solving a contrast among those disciplines by finding a fair balance, States find an agreement in the harmonisation of private international law rules related to the specific topic, both with reference to conflict of law rules and to international jurisdiction.

However, this compromise does not fully satisfy the requirement for certainty which affects global navigation satellite systems, because the issue of the identification of the responsible party and the measure of the compensation amount will in any case vary from State to State.

Obviously, an international convention could not manage all issues related to GNSS liability system, for which national substantive laws shall keep a subsidiary role, while the international rules shall be limited to establish some basic principles and standards in order to provide financial protection against damage resulting from a GNSS malfunction.

From the analysis of the existing international instruments concerning civil liability, it comes out that the best way to manage such kind of liability is to submit it to a strict liability

principle, channelled exclusively toward a sole responsible party easily identifiable and economically reliable, with the exclusion of any other private or public entity.

Applying strict liability principle to GNSS field, the damaged party would only be required to show that the loss can be attributed to the system malfunction, and would not have to demonstrate the fault or negligence of the party called on for compensation. According to this regime the damaged party is lightened from the evidence rule following which it has to prove that the damage is linked to a negligent conduct of the responsible party, and it only has to prove the causal connection between the damage and the system malfunction.

Pointed out the responsibility rule, it has to be identified who is the responsible party. Considering the possible chain going from the signal provider to the end user, it would be rather difficult to identify the person to be sued for compensation. Therefore, the identification has to be made directly by the international and uniform regime in channelling the liability to the specific party, easily identifiable, economically reliable and performing a presumably most hazardous activity. This principle has been worked out to "internalise" costs deriving from the performance of hazardous activities, allocating the total costs of reimbursement, prevention and restoration to the party that, being engaged in the risky activity, creates the conditions which result in the alleged losses.

The reference model should be the one set forth by the 1963 Vienna convention, as amended by the 1997 Protocol, which establishes that liability is channelled exclusively on the operators of the nuclear installations and that liability of the operator is absolute, i.e. the operator is held liable irrespective of fault. This means also that no person other than the operator shall be liable for nuclear damage in respect to the victims.

Channelling the liability on one person entails, on the one hand, attribution of responsibility to a party easily identifiable, economically reliable and presumably engaged in activities assumed to be the most hazardous and, on the other hand, it makes possible to exclude from responsibility, at least towards third parties and subject to possible recourse action, any other party involved in performing such services.

A proper convention on GNSS civil liability would allow victims of an accident arising from a system malfunction of the global navigation satellite system to identify the

responsible party in the “person” with the above mentioned characteristics. This person would be the best responsible party both for victims, because of the plain relationship between its role of service provider and end users, so that it could be easily identified and, consequently, sued before the competent court, as well as for the person called for compensation, being the service provider the best person who can evaluate and internalise costs of the performed activity providing adequate insurance coverage.

However, some protection clauses for the responsible party should be introduced in order to mitigate the impact of strict liability channelled towards a specific party; first of all common exemptions from responsibility, such as when the accident is directly due to an act of armed conflict, hostilities, civil war or insurrection, the consequence of armed conflict, or to an act of terrorism or any act having similar characteristics, as well as to a serious natural disaster of an exceptional character, should be provided. Furthermore, the operator can be wholly or partially relieved from his obligation to pay compensation in respect of the damage suffered by the person who caused it either from his gross negligence or from an act or omission done with intent to cause damage.

Furthermore, time limits to compensation action and limits to the amount of compensation could be laid; the size of the limit is usually established considering not merely the value of the type of service that is provided, but above all with reference to the insurance market and its ability to support claims for indemnity from damaged parties. In fact, international practice calls for a compulsory insurance at the responsible party's charge, for an amount at least equivalent to the above mentioned limit, in order to have full financial cover for the alleged damages and protect both victims and responsible parties.

Strictly connected to this clause, a faculty to claim directly against the insurer can be given to the damaged party; this approach would certainly reduce procedural costs and simplify the compensation mechanism, splitting the relationship between the insurer and the insured-responsible party from the right of the victims to find full compensation.

Considering the massive damage that could be caused by a system malfunction, and always keeping in mind the aim of an international regulation in this field, a supplementary compensation fund could be established. The reference models are the 1971 International Convention on the

Establishment of an International Fund for Compensation for Oil Pollution Damage (1971 Fund Convention) and the 1997 Convention on Supplementary Compensation for Nuclear Damage, through which the payment of supplementary compensation to those who could not obtain full compensation for the damage from the responsible party is provided.

While according to the FUND convention the fund is financed by contributions levied on companies in Fund Convention countries that receive crude oil and heavy fuel oil after sea transport, the specific nature of GNSS activities and the bond between private operators and public entities in the exploitation of satellite systems, let us deem that the fund should be financed by States in proportion of the advantage they take from the system's use.

With reference to the conditions under which the damaged party should benefit of the supplementary compensation, the general rule following which the right of extra-compensation arises only if the responsible party and his insurer can not meet the reimbursement obligation, or if the liability limit is lower than the total reimbursement claims, or if an exoneration clause excludes liability, can be transposed to the GNSS specific field.

Finally, provisions should be set up with regard to the conditions under which sovereign immunity could not be invoked, in order to avoid situations where parties would be unable to seek redress due to this rule, and the convention should also propose exclusive jurisdiction of a court, preferably of courts of the participating countries in whose territory damages occurred.

### 2.2.8. Conclusions

From the analysis of the premises of the possible solutions concerning the liability deriving from GNSS, it emerges that the proper legal framework for an uniform regime of GNSS TPL is an international convention of uniform law. The need of such instruments is mainly due to the fact that such regime implies mandatory rules and may not depend on acts of private autonomy not being capable: i) to protect victims of incidents in a specific field characterised by a high risk factor, and ii) to introduce an element of certainty in the discipline of compensation of huge damages.

The need for an international convention is even stronger if we consider the global aspect of GNSS, and the wider spread of this



technology affecting all relevant economic activities, by now free from the original military purpose. In fact, differences among States' legal orders are stressed in case of trans-national phenomena where relevant damages can be imagined and different courts could be seized.

In such cases, the uncertainty connected to the new technology comes along with the need for a uniform mandatory regime, as the best solution for the removal of uncertainty and for the balance among different interests involved in the exploitation of satellite based applications.

Moreover, the international nature of the subject matter implies that many different legal orders are virtually ruling the phenomenon, each of them setting its own laws and principles based on different political and economic purposes. As already said, these differences in national regulations come along with uncertainty for all the parties interested in the provision of the service; therefore in order to address States' policies and laws, a uniform international regime has to be set up, independently from national legislators' trends.

## *2.3. GNSS: The Basic Principles for a European Legal Framework on TPL*

*by Anna Masutti*

### **2.3.1. Foreword**

The Global Navigation Satellite Systems, Galileo and EGNOS, are expected to be extremely widespread on a global level. They represent an evolution and a substantial improvement of the satellite radio-navigation systems currently existing, such as GPS and GLONASS.

Considering that GNSS Systems can be used also for navigation and transport, the malfunctioning of their signal may cause significant damage that could even be catastrophic. The absence of harmonized regulation may cause a number of problems. Such problems include the difficulty and costs of identifying the responsible party, uncertainty relating to the notion of reimbursable loss, the introduction of effective loss recovery mechanisms, including the right of recourse against the responsible party.

The analysis of the convention scenario concerning uniform civil liability rules highlighted a set of well consolidated approaches, in practice on an international level in cases of catastrophic events. The aim of this presentation is to make a broad reference to these approaches when devising a specific regime for civil liability for loss deriving from GNSS Services. The above mentioned regime should include: the strict liability rule; liability channelling; limit to liability; compulsory insurance for at least the limit of liability; the provision for supplementary compensation to guarantee satisfactory reimbursement of losses; and the possibility to exercise the right of recourse.

### **2.3.2. Purposes of the European GNSS Systems**

The GNSS Systems, Galileo and EGNOS, aim at providing a satellite radio-navigation system co-financed by the European Union (EU) and European Space Agency (ESA). It will allow users worldwide to pinpoint their location at any time. Furthermore, Galileo is to be a civilian system under civil control. The system consists of a constellation of thirty satellites positioned on a Medium Earth Orbit and with adequate cover to guarantee services on a worldwide scale.

The GNSS System is intended to contribute directly and indirectly to various sectors such as transport, communication, land surveying, agriculture, fisheries, environmental protection, scientific research, tourism, and other activities. The GNSS System will also improve vehicle navigation, relieve traffic conditions, guide people with disabilities, and locate goods, animals, and containers. It will also facilitate civil protection operations, speed up rescue operations for people in distress at sea, and provide tools for coastguards and border controls. Lastly, it will be helpful in time stamping financial transactions, scientific research in meteorology, geodesy, earth movement monitoring, and other activities<sup>103</sup>.

The Commission<sup>104</sup> has defined the different kinds of services that will be provided by the Galileo Programme. The Open Service (OS) consists of a combination of open signals and will be free of charge. It shall provide position and timing performance comparable to other GNSS systems. A second kind of service is

<sup>103</sup> European Commission, Communication – Galileo at a Cross-Road: the Implementation of the European GNSS Programmes, COM (2007) 261 Final, para. 2.

<sup>104</sup> European Commission, Communication on State of progress of the Galileo Programme, COM (2002) 518 Final, 2 – 22.

the Safety of Life Service (SoL), which will improve Open Service performance by providing the user with early warnings when it fails to meet certain margins of accuracy (integrity). The programme will also offer Commercial Service (CS), which allows access to two additional signals for a higher data rate throughput and so that users can improve accuracy. The Public Regulated Service (PRS), mostly for government use, supplies position and timing for specific users who require a high continuity of service with controlled access. Lastly, the Search and Rescue Service (SAR) will globally broadcast the alert messages received from distress emitting beacons.

There are several positive aspects of the GNSS Programmes. From a political perspective, it will encourage European independence. European member states will no longer be dependent on satellite services for strategic areas that are developed and provided abroad. In addition, the programme will contribute to enhancing Europe's international influence. Indeed, the European Union has already signed cooperation agreements for use of the Galileo system with a number of countries such as China, Israel, India, Ukraine, Korea, and Morocco, and further agreements are currently being negotiated with Latin American and Asian countries<sup>105</sup>.

From the technological point of view, the GNSS Programmes will permit the use and development of advanced technology, especially as far as the satellite industry is concerned. According to a number of cost/benefit studies, the system will also have a very positive effect from an economic standpoint by creating more than 150,000 jobs. Furthermore, many economic sectors will benefit indirectly in terms of profit and efficiency (for instance, it has been calculated that a 1% reduction in road traffic travelling time in the period 2011-2025 will save 200 billion euros).

### 2.3.3. The present status of GNSS Programmes

The Galileo Constellation will be formed by thirty satellites positioned in Medium Earth Orbit. Two experimental satellites are already in orbit: Giove A and Giove B launched by Soyuz from Baikonour in December 2005 and

<sup>105</sup> The European Union has signed an agreement with the United States for the compatibility and interoperability of the Galileo System and the GPS System. The prospects for Galileo System use involve an ever-greater number of countries from around the world.

April 2008. The 4 initial IOV (In Orbit Validation) satellites, produced by EADS Astrium, should be launched by 2010. The 26 FOC (Full Operational Capability) satellites completing the whole System, should be launched by 2013. Two Galileo Control Centres (in Fucino, Italy and Oberpfaffenhofen, Germany) are going to be completed.

As the private sector was not prepared to bear market and technical risks and invest sufficient funds in the programmes, it has been decided that the amount of € 3.4 billion to fund the remaining development and validation phase, the deployment phase of Galileo, the operation of EGNOS, the preparation of the exploitation phase of the programmes, will be secured by the European Union between 1 January 2007 and 31 December 2013.

### 2.3.4. Governance principles for GNSS programmes

The decision to fund the GNSS Programmes entirely by the European Community is contained in Regulation (EC) No 683/2008 of 9 July 2008 "On the further implementation of the European satellite navigation programmes (EGNOS and Galileo)"<sup>106</sup>.

The Regulation has also established, *inter alia*, that the European Community shall be the owner of all tangible or intangible assets created or developed under the GNSS systems; a strict division of responsibility between the Commission, the European GNSS Supervisory Authority and ESA; a close cooperation between the three institutions through the Galileo Interinstitutional Panel (GIP), in keeping with the Joint Declaration Annex to Regulation (EC) No 683/2008; uniform management of the programmes and equal access to information through the European GNSS Programmes Committee, which assists the Commission. ESA and GSA representatives may be involved as observers.

Regulation (EC) No 683/2008 has also established a few basic principles. The main one guarantees the balanced participation of industry at all levels including SMEs (Small Medium Enterprises). Consequently, the governance of the System should exclude the abuse of dominant position by single suppliers. The prior investment and industrial experience acquired in the development phase of the programmes should be fully considered for the future implementation of Galileo EGNOS.

<sup>106</sup> OJEU ([2008] OJ L 196/1)



The Regulation establishing the main principles for the procurement of the infrastructure, aiming at the completion of the constellation, has split such procurement into a set of six main work packages. The management of the procurement is assigned to ESA (under the Commission control) by the European Union, through a Delegation agreement signed on 19 December 2008.

### 2.3.5. Legal problems arising from the lack of regulation for civil liability

European institutions have already laid down some rules concerning the GNSS Systems. Regulation (EC) No 683/2008 has already established the governance of the system, the certification responsibility of the certifying authority (GNSS SA ensuring that the Systems are certified by appropriate bodies, according to Article 16 of Regulation (EC) No 683/2008). Contractual provisions for the exploitation phase are established in Regulation (EC) No 683/2008, which states that there shall be a feasibility study on the use of service concession contracts or public service contracts with private sector entities. A revenue-sharing mechanism may be provided for in contracts with the private sector (Article 11).

Nevertheless, there is no specific legislation (or proposed legislation) concerning the civil liability that may derive from the services offered by the GNSS Programme. Yet there are evident risks connected to the GNSS system's operation. A signal malfunction, such as an absence of signal or an error/degradation in the signal, could not only cause hefty economic losses but also huge damage in a vast area or to a very large number of people. For example, an incorrect signal function could lead to a plane crash or shipping accident, causing substantial loss of life and damage to property and the environment. As another example, a malfunction during territory monitoring or civil engineering work could cause widespread disruption.

A possible regulation for catastrophic events deriving from a malfunctioning of a GNSS System should guarantee an adequate compensation for victims. The principle is covered in Regulation (EC) No 683/2008. Article 4.3 states that "in 2010, the Commission shall (...) submit to the European Parliament and the Council (...) a proposal concerning the public funds and commitments required for the financing programming period starting 2014 also

covering any financial obligations (...) deriving from its responsibility in relation to the ownership of the system", and Recital 22 of the same Regulation further states that GNSS Programmes "do not take account of unforeseen financial obligations which the Community may be obliged to bear in particular those relating to non-contractual liability arising from the public ownership of the systems especially with regard to force majeure and catastrophic failure".

It is clear that the EU obligations foreseen in Regulation (EC) No 683/2008, can not be left undetermined. Moreover, any service or product is not commercially viable (and insurable) unless there is properly regulated civil liability with legal and financial responsibility clearly defined.

It is evident that incidents that could arise from the system malfunctioning are likely to involve the interests of a number of jurisdictions. They may involve people and organisations from different nations, and the damage to property and the environment may affect several countries. In such circumstances, due to the absence of legislation, many difficulties could arise in the effort to solve legal problems<sup>107</sup>.

Another important aim of the future set of regulations for GNSS should be the creation of a fair balance between the protection of victims (e.g. the channelling of liability and strict liability regime), and the financial interests of the players in the marketplace (e.g. limitation of compensation in both liability tiers).

#### *Identifying the responsible party*

One problem arises from the fact that GNSS are extremely complex, technologically advanced systems involving a number of public (European Union and Member States) and private (industries in various sectors) parties. Public parties are to finance the creation and operation of the system (this phase involves the European Union and the European Space Agency), and private entities are to supervise the operation of the system thereafter. Moreover, GNSS services may be offered to end-users by numerous other private and public parties. In the absence of clear uniform legislation attributing liability, these characteristics make identifying the party responsible for loss somewhat complex and difficult.

<sup>107</sup> Schubert, Francis. "An International Convention on GNSS Liability: When Does Desirable Become Necessary?" *Annals of Air and Space Law*, vol. XXIV (1999), 246 seq.



In this context, the various compensation proceedings pursued by parties that suffer damage could face two different types of problems. Firstly, an action brought against a party in a weak financial position that is unable to meet reasonable reimbursement expectations. Secondly, actions against parties whose assets are intended to guarantee the very existence of this system with public interest purposes.

#### *Definition of damage compensation*

Another problem is related to the definition of *reimbursable loss*. As is well known, academics consider this to be one of the most controversial aspects of legal theory, and it has given rise to a variety of national and international laws.

One widely applied principle is *causal nexus*, which is the idea that reimbursable damage is due when an event or action causes injury to third parties.

In the case of the GNSS system, a signal malfunction (interruption, deterioration, or sub-standard performance) may cause considerable loss to third parties. Malfunctioning of the GNSS signal/service may be defined as the absence of the GNSS signal, an error in the GNSS signal, and/or the degradation of performance below the thresholds defined by the Key Performance Indicators (KPIs). Malfunctioning of the GNSS services may be identified as the inadequate quality of the service (e.g. incorrect AIP procedures; wrong vectoring by ATC regardless of the correct or incorrect functioning of the GNSS signal). Finally, malfunctioning of GNSS certified End User Equipment is defined as incorrect information or data, different from that for which the end user equipment has been produced and certified to process, supplied in the presence of a correct functioning of the signal.

A legal framework would offer the indisputable advantages of identifying cases in which parties are eligible for compensation and restricting the number of disputes that could arise from state provisions.

Identifying the extent to which victims' claims can be accepted is just as difficult. The absence of a framework of harmonized rules may cause disparity in treatment between those who, under certain systems, benefit from indemnity for indirect damage, and those whose legal system only recognises indemnity for damage that is a direct and the immediate consequences of an incident.

#### **2.3.6. Inadequacy of the current legal framework**

Although there are no specific international rules governing satellite radio-navigation services, international conventions concerning compensation for damage deriving from catastrophic incidents, such as those that could be caused by the performance of the GNSS system, do exist. Examples worth mentioning are the Brussels Convention on Civil Liability for Damage from Oil Pollution (CLC Convention), 29 November 1969; the correlated Brussels Convention of 18 December 1971 on Establishing an International Fund (the Fund Convention); the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention), London, 3 May 1996; the Convention on Civil Liability for Nuclear Damage, Vienna, 21 May 1963; and the Convention on Supplementary Compensation for Nuclear Damage, 12 September 1997.

The existence of these international conventions poses coordination problems for cases in which incidents are caused by a malfunctioning of GNSS services because liability for compensation falls within the scope of one or more of these conventions.

A different coordination problem could arise in relation to Article 28 of the 1944 Chicago Convention, now universally applied. This article declares that States undertake to provide navigation facilities in order to assure international air navigation and to adopt and put into operation the appropriate communication practices recommended or established from time to time, pursuant to the convention<sup>108</sup>. According to common interpretation, Article 28 makes participating states responsible for the services intended to facilitate air navigation and improve the

<sup>108</sup> Convention on International Civil Aviation (Chicago Convention), Chicago 7 Dec. 1944, Art. 28 "Each contracting State undertakes, so far as it may find practicable, to: (a) 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; (b) 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; (c) Collaborate in international measures to secure the publication of aeronautical maps and charts in accordance with standards which may be recommended or established from time to time, pursuant to this Convention".



safety thereof. Worldwide adoption of Galileo services could affect the actual possibility of states to fulfill such an obligation, given that these services are provided through a system outside the states' control. In the case of an incident involving aircraft, the problem of the effective observance of Article 28 of the Convention and the consequent responsibility of the states could arise.

### **2.3.7. The framework relevant to drafting civil liability rules for damage deriving from GNSS services**

Since the 1960s many international measures have been adopted to guarantee forms of indemnity for the victims of *catastrophic* incidents because they are likely to involve a significant number of people and to extend over vast areas of one or more countries, damaging both the environment and economic activities. More specifically, these rules were adopted in sectors considered urgently in need of forms of responsibility for those who intended to undertake hazardous activities, regardless of whether they are a public or private body. These measures were also developed in order to prevent any disparity of treatment arising from paying different indemnities to victims of the same incident. Another important issue in creating a framework of international rules in this context was the need to protect the parties involved in providing services of significant public interest from being obliged to answer unlimited claims for compensation.

The most important and best known features of this framework are demonstrated by the abovementioned international conventions such as the 1963 Convention on Civil Liability for Nuclear Damage and the 1997 Supplementary Convention, the Civil Liability Convention, and the Fund Convention. An analysis of these texts shows that all of them draw inspiration from certain consolidated principles that tend to be uniformly applied and that may serve as a reference for the future uniform regime on civil liability for damage deriving from GNSS services.

These principles include but are not limited to the description that follows. First of all, international conventions on civil liability give a specific definition of the damage eligible for compensation so as to clarify the limits of claims as much as possible. Secondly, the same kinds of conventions adopt "channelling of liability". According to this principle, the claims may only be brought against a sole, clearly identified party, and it is generally utilised for easing the burden of proof on victims. Thirdly, once again with the purpose

of favoring injured parties, a regime of strict liability is normally provided. To counterbalance this severe regulation, however, responsibility is limited in terms of amount and the period within which a claim can be made. In addition, it is usually compulsory for a responsible party to have insurance that is at least equivalent to the limit of liability. International practice also calls for arranging supplementary compensation to guarantee satisfactory loss reimbursement but mainly in cases where the first tier of liability has proven to be insufficient to compensate the injured parties. Last of all, there is always a clause which identifies the applicable jurisdiction.

### **2.3.8. Damage eligible for compensation**

The experience obtained in sectors in which responsible parties are expected to compensate a large number of victims (for instance, oil pollution or nuclear energy incidents) has led to the formulation of a concept of reimbursable damage encompassing loss of life, personal injury, property damage, and the cost of preventive measures.

The international framework mentioned above considers loss of life and personal injury as the main and most important category of reimbursable loss. It gives preference to the distribution of indemnity related to these categories of damage to the detriment of property damage. For example, the HNS Convention establishes that claims for death or personal injury have priority over other claims, except to the extent that the aggregate of such claims exceeds two-thirds of the total amount of the liability<sup>109</sup>.

One controversial point at an international level relates to the possibility of indemnifying not only physical injury but also psychological damage, regardless of whether it is a direct consequence of physical injury. Case law in many national legal systems (e.g. in Italy) is oriented towards granting reimbursement for psychological damage, whether or not it derives from physical injury<sup>110</sup>. In other domestic legal systems and in the case law

<sup>109</sup> IMO, International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS Convention), May 1996, Art. 11.

<sup>110</sup> Italian Constitutional Court 14 July 1986, 184, and, more specifically, Constitutional Court 11 July 2003, 233, in *Foro it.*, 2003, 1, 2201. In certain sectors of contractual responsibility jurisprudence is more oriented toward excluding reimbursement for mere psychological damage because it would otherwise lead to a substantial number of claims.

related to international regulations, financial compensation for psychological damage alone is excluded because it could lead to a large number of ill-founded claims<sup>111</sup>. Uniform legislation should try to define the concept of personal injury, evaluating whether or not to restrict it to physical damage and potentially exclude psychological damage.

Another controversial point is compensation for indirect damage. In this regard, there appears to be a kind of inconsistency in case law relating to international practice concerning the eligibility of claims for restoring loss of profit. In certain cases, courts have admitted compensation for so called pure economic loss, namely economic loss experienced by victims, even in the absence of a direct loss of or damage to property; other courts exclude financial compensation for damage in the absence of a precise correlation between loss and the ownership of an asset<sup>112</sup>. More often than not, however, courts recognise eligibility for damages when injured parties are able to demonstrate the connection between the damage to their assets, consequent economic loss, and the actual damaging incident<sup>113</sup>. A

clear framework of rules could prevent disparity in how injured parties are compensated for damage.

Indemnity for applying preventive measures has sometimes been confused with indemnity for reinstating the situation prior to the accident. A clear legal framework on the subject would not only help identify the entity and type of reimbursable damage by introducing instruments for certain forms of damage prevention but could also prove essential to the adoption of urgent salvage and assistance measures for loss involving several countries whereas regulatory uncertainty may constitute a hindrance to swift action.

### 2.3.9. The channelling liability system

This principle consists of channelling the liability to a specific party and is widely used in international regulation in relation to the consequences of events that might cause massive losses in terms of persons, assets, and the environment<sup>114</sup>. The institution of channelled liability has been adopted to "internalise" the costs deriving from the performance of hazardous activities (such as the transportation of highly toxic materials), allocating the total costs of reimbursement, prevention, and restoration to the party that creates the conditions for the loss.

The main effect sought by the channelling approach is to simplify the onus of proof. The victims simply demonstrate that their loss derives from the adverse effects of the incident that occurred. Once the causal nexus has been established between the loss and the conduct considered relevant, the victims of the incident are able to identify the responsible party with certainty.

Channelled liability also eliminates the likelihood of erroneously identifying

<sup>111</sup> E.g. the Convention for the Unification of Certain Rules Relating to International Carriage by Air (Warsaw Convention), Warsaw 12 Oct. 1929 and subsequent amendments, excludes indemnity for just psychological damage. See U.K. Court of Appeal, 17 May 2001, *Morris v. KLM Royal Dutch Airlines*: uniform law only contemplates indemnity for "bodily injury" (Art. 17 of the 1929 Warsaw Convention and Convention for the Unification of Certain Rules for International Carriage by Air, Montreal, 28 May 1999).

<sup>112</sup> The first significant applications of the rule of the correlation between loss and ownership of the asset were in American jurisprudence: see *Robins Dry Dock & Repair Co. v. Flint*, 48 S.Ct., 134. Thereafter, American jurisprudence with regard to pollution damage recognised specific protection for those subjects put in a particularly vulnerable position due to sea pollution to ensure that, on equal standing with other citizens, they may have property rights (which can therefore be damaged) over the sea's fishing resources (see *Burgess v. Tamano*, 370 F.Supp., 247, and *Union Oil Co. v. Oppen*, 501 F.2d., 558). However the Oil Pollution Act 1990 (cited as "Oil Pollution Act of 1990") in force in the United States would appear to recognise the reimbursability of "pure economic losses", regardless of whether a property right has been damaged. Section 1002 entitled "Elements of Liability", in para. b), 2, E) reads: "PROFIT AND EARNING CAPACITY, Damage equal to the loss of profits or impairment of earning capacity due to the injury, destruction, or loss of real property, personal property, or natural resources, which shall be recoverable by any claimant".

<sup>113</sup> E.g. the incident caused by the Liberian tanker *Braer* that grounded south of the Shetland Islands (United Kingdom). The ship eventually broke up, and both the cargo and bunkers spilled into the sea. *Landcatch Ltd. v. International Oil Pollution Compensation Fund.—Landcatch Ltd. v. Braer Corporation and Others.—The "Braer", Outer House of the Court of Session*, 11 November 1997 (2 Lloyd's Rep. 552, 1998, and Dir. Mar. 931, 1999). The shipowner, the Skuld Club, and the 1971 Fund appealed

against a part of the Court's decision on the grounds that the loss of profit claim was based on the numbers and the cost of smolt as set out in the claim which was based on the alleged contracts which had been shown to be false. In January 2005, the Appellate Court issued a judgment confirming the decision of the Court of first instance. Accordingly, although Shetland Sea Farms could not rely on the existence of the alleged contract, the company could proceed with the claim on the basis that, even if there was no pre-existing contract, it would have acquired, reared and sold smolt from which it would have earned a profit.

<sup>114</sup> In the case of damage caused by a nuclear incident, the responsibility of plant builders has been excluded in the fear that their excessive involvement would create a hindrance to energy producing industries ("including some or all suppliers of related technology, and suppliers of nuclear fuels and materials").



jurisdiction and the high cost of having to make a number of claims. In some instances the party towards which the liability is channeled is not the only party involved in the incident and in the position to take all the measures to avoid it. For example, in the CLC Convention, liability is channeled towards the owner of the ship, but the incident may have not been caused by him or may have only been partially caused by his actions or decisions.

The most eloquent example in this respect is found in the Protocol on Liability Compensation for Damage resulting from Transboundary Movements of Hazardous Wastes and their Disposal. Article 6 of this Protocol states that the liability is not attributed to the person in possession and/or control of hazardous wastes but to the person that, in accordance with Article 6 of the Basel Convention<sup>115</sup>, notifies the proposed transboundary movement of hazardous wastes. This kind of solution can be explained by the fact that channeling liability reflects the political choice of assuring effective compensation to the victims over identifying the real responsible party.

The advantages of adopting this approach are immediately evident for victims of an incident arising from a malfunction in the GNSS system. Considering that malfunctioning may occur due to signal degradation or errors or even from the end user's equipment working incorrectly, several parties could be held responsible for the incident: first of all, the ESA (European Space Agency) as designer of the satellites; secondly, both the European Community as owner of the system and the public authorities of Member States responsible for implementing the system and monitoring services. On a private level, a future operator of the GNSS system, including their subsidiaries and subcontractors responsible for certain operations, may theoretically be considered liable. Such a large number of possible responsible parties may imply high costs for the victims in terms of number of lawsuits, number of potentially competent jurisdictions, and risks of identifying the wrong respondent or a respondent immune from jurisdiction.

In order to avoid the risks mentioned above and to single out the party for channeling liability, the most reasonable approach in to choose is the most easily identifiable person or entity. The injured parties can bring their

claims against a single, clearly identifiable party without particular difficulties. This approach is similar to the one used in international practice.

With regard to that practice, the channeling liability approach entails, on the one hand, attributing responsibility to a party engaged in activities assumed to be hazardous and in any case likely to cause hefty loss to others. On the other, this approach makes it possible to exclude all those involved to varying degrees in such services from responsibility.

### 2.3.10. Strict liability regime and compensation limits

As mentioned previously, the strict liability regime is widely applied in international regulations. By virtue of such principle, the damaged party is only required to show that the loss can be attributed to the relevant conduct or event and is not obliged to demonstrate the compensating party's fault or negligence. Consequently, the compensating party is also responsible if the loss cannot be attributed to negligent conduct on its part. Like channeling of liability, this principle also intends to satisfy the victims' demand for compensation. In fact, the principle's main advantage consists in freeing the damaged party from having to prove the illegality of the liable party's conduct, which is often a somewhat complex and delicate matter.

One example of this principle's implementation is demonstrated by the HNS Convention. The convention provides that the owner of a ship at an time of the incident is liable for damage caused by any hazardous or noxious substances in connection with their carriage by sea on board the ship<sup>116</sup>. An even clearer example comes from the 1997 Vienna Convention on Civil Liability for Nuclear Damage. It provides that the operator of a nuclear installation shall be considered liable only upon proof that such damage has been caused by a nuclear incident at its nuclear installation or involving nuclear material coming from or originating in his nuclear installation<sup>117</sup>.

The strict liability regime is usually mitigated by the adoption of the so called "Act of God" doctrine. This excludes liability when it can be proved that the damage resulting from unforeseen circumstances outside human control, such as armed conflict, hostilities,

<sup>115</sup> Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention), 5 May 1992.

<sup>116</sup> HNS Convention, Art. 7(1); CLC as amended by the Protocol of 1992, 30 May 1996. Art. III(1).

<sup>117</sup> Vienna Convention on Civil Liability for Nuclear Damage, 21 May 1963.

civil war, exceptional natural phenomenon, and so on. Traditionally, the liable party may be exonerated wholly or partially from liability also by proving that the loss was deliberately caused (wholly or in part) by the party suffering the loss or due to actions or omissions by such party<sup>118</sup>.

Another example of exemption could refer to the open services. Regarding these services, an exclusion of liability could be established if the damage is caused by a malfunctioning of the GNSS Signal used to provide an open service (OS).

Considering the specific features of the GNSS services, it may be wise to establish a strict liability regime for at least two cases. Firstly, when there is proof that the incident has been caused by the malfunctioning of the European GNSS signal, that is, when the signal is subject to errors or degradation under a certain threshold. The second case is when it is possible to establish that the incident is due to a malfunctioning of the equipment used by the end users to receive the signal under the condition that the equipment in question has been duly certified by a competent authority. Otherwise the liable party would also pay for an incident caused by inappropriate or counterfeited equipment.

In international practice the strict liability regime is somewhat offset by a limit for compensation and by certain cases of exoneration from responsibility.

The limited compensation mechanism is often applied to breaches of contract as well as to non-contractual liability. Many examples of limited contractual responsibility can be found in certain rules for contracts for the air transportation of persons, goods, and baggage, and for the sea transport of goods (Convention for the Unification of Certain Rules Relation to International Carriage by Air signed at Warsaw 1929 as amended in 1955<sup>119</sup> and the International Convention for

the Unification of Certain Rules of Law Relating to Bills of Lading, signed at Brussels on 25th August 1924 as amended by the Brussels Protocol 1968<sup>120</sup>). With regard to non-contractual liability, ship-owners benefit from reimbursement limits pursuant to the 1969 CLC Convention and the 1996 HNS Convention<sup>121</sup>. Responsibility of the liable party is also limited in the 1963 Vienna Convention on Civil Liability for Nuclear Damage and the subsequent 1997 Protocol<sup>122</sup>.

The limit is traditionally established by considering not only the type of services provided but also the insurance market and its ability to support claims for indemnifying catastrophic damages. This approach should also be followed when drafting civil liability regulations for GNSS services, so as to guarantee that the insurance market will actually cover the possible relevant damage. Nevertheless, this limit should not be so low as to be insufficient for the amount of claims. This concern is justified by past accidents, especially in the maritime sector, and leads to the conclusion that compensation should be fixed at a substantial level.

This conclusion could potentially be criticised on the basis that not all services supplied by the provider are capable of causing catastrophic incidents. As a consequence, fixing the same high limit of compensation for all kinds of services could turn out to be an unjustified cost for the insured.

A potential solution to be adopted in an European liability regime could be giving the liable provider's Member State the possibility of establishing a lower amount of liability as long as the Member State undertakes to make public funds available up to the limit set by the legal regime.

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October 1929, executed at The Hague on 28 September 1955.

<sup>120</sup> See Article 2 of the 1968 Protocol that amends Article IV(5) of the International Convention for the Unification of Certain Rules of Law Relating to Bills of Lading ("Visby Rules"), Brussels, 23 February 1968.

<sup>121</sup> The CLC Convention as amended by the London Protocol, 27 Nov. 1992 provides the limitation of liability in Article V, which establishes that the owner of a ship is entitled to limit his liability in respect of any one incident to an aggregate amount calculated as follows: "(a) 3 million units of account for a ship not exceeding 5,000 units of tonnage; (b) for a ship with a tonnage in excess thereof, for each additional unit of tonnage, 420 units of account in addition to the amount mentioned in subparagraph (a); provided, however, that this aggregate amount shall not in any event exceed 59.7 million units of account". A similar provision is found in Article 9 of the HNS Convention.

<sup>122</sup> In the Vienna Convention for Nuclear Damage 1963 as amended by the Protocol of 1997 Art. V.

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<sup>118</sup> In this regard, Art. 4(2) of the 1997 Vienna Convention provides a greater burden than that placed on the Provider by the proposed regulation because it requires proof of *gross negligence* for the total or partial exoneration of the operator. In addition, such exoneration is not automatic but merely decided by the competent court: "If the operator proves that the nuclear damage resulted wholly or partly either from the gross negligence of the person suffering the damage or from an act or omission of such person done with intent to cause damage, the competent court may, if its law so provides, relieve the operator wholly or partly from his obligation to pay compensation in respect of the damage suffered by such person".

<sup>119</sup> See Article XI of The Protocol to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air, Signed at Warsaw on 12



In international regulations, the responsible party loses the benefit of the limit if it caused the damage by deliberate or reckless action (deliberate fault with foreknowledge of the event) or gross negligence. It is widely recognised that such a limit cannot be used by liable parties when they caused the damage deliberately or by reckless behaviour with foreknowledge of the event's severe consequences, which the injured party is required to prove. There is no reason to exclude that a similar provision could be part of the civil liability regime for GNSS services.

Traditionally, the grounds for exoneration from responsibility are when the incident is the consequence of armed conflict, an act of terrorism or any act having similar characteristics, or it is the consequence of negligent behaviour by public authorities. Similarly, the party may be held not responsible by demonstrating that the loss is the consequence of an exceptional, irresistible, and unforeseeable event, or that it was caused by the action or omission of third parties with the intent to cause damage or in the full knowledge that their action would have caused loss. By the same token, civil liability rules also exonerate parties from liability if the loss was wholly or partly caused by the victim.

#### **2.3.11. Compulsory insurance of the liable party**

International practice pursues guaranteeing effective reimbursement for the loss suffered within the legally established liability limits through compulsory insurance for an amount equivalent to the limits mentioned before. Said obligation is conventionally accompanied by detailed provisions concerning the content and minimum requirements of insurance coverage or other financial guarantees (for instance, the provisions set forth in the CLC Convention provide a standard certificate model to be used when transporting hydrocarbons by sea). The insurance obligation normally offers the damaged party the power to claim against the insurer rather than the responsible party. This approach was introduced not only in favour of the latter but also in favour of injured parties because it allows them to take direct action against the parties that will cover the risk of the civil liability of the responsible parties. Direct claims against the insurer is a common solution adopted at the international level to protect victims who have stronger guarantee for compensation, and rationalise/reduce the cost of claims.

It is important to note that in international practice the insurer can raise all the

objections that the insured party is entitled to raise since the insurer replaces the responsible party in dealings with the victims.

The insurer can also apply the limitation of liability rules so that the victim is compensated within the limits of the liable party's responsibility.

Lastly the insurer can be exonerated from the obligation to pay compensation if the liable party is responsible for reckless action taken with the knowledge that losses would probably result.

#### **2.3.12. Supplementary compensation mechanism**

Another principle that emerges from international practice is arranging for supplementary compensation in order to provide injured parties with effective protection. The supplementary compensation provision was first introduced in international measures governing civil liability for loss caused by nuclear energy and sea pollution. This type of compensation was created with the knowledge that massive damages often cannot be shouldered by just the responsible party and its insurers or those granting equivalent financial guarantees.

It is usually provided in cases when the responsible party and its insurer are unable to meet the reimbursement obligation, when the liability limit is lower than the total of reimbursement claims made by damaged parties, or when the party held responsible is eligible for exoneration from liability.

International conventions have introduced funding mechanisms other than that of the responsible party. Such mechanisms basically follow two models. The first model calls for the creation of a fund by drawing directly on the parties implicated in the activity deemed dangerous or potential source of catastrophic damage. In particular, with regard to the Fund Convention and the HNS Convention, the parties required to contribute to the fund are the importers of oil or other noxious and hazardous substances. The second model, adopted by the Convention on Supplementary Compensation for Nuclear Damage, provides for the creation of a fund drawing on state resources.

In the case of damage due to GNSS malfunctioning, the specific nature of the programme in question should be taken into account in order to decide which of the two mentioned models should be adopted. GNSS intends to provide both commercial and public interest services. Furthermore, GNSS

systems were conceived as involving other non-European states due to its strategic importance as regards satellite radio-navigation and the essential public interests implicated. In light of these considerations and the need to guarantee full recovery to the injured parties of an incident, it appears that the potential regime for GNSS services should follow the second model.

In addition to a first level of liability and compulsory insurance, a second level of compensation for loss should be introduced by constituting an international fund financed by public bodies. Such cooperation between a first tier and a supplementary tier spreads the insurance burdens and costs for loss reimbursement. At the same time, this two-tier system does not constitute a competitive obstacle to service performance, and it improves the protection offered to the damaged parties.

In accordance with international practice, the compensation fund should be drawn on in three situations: when the losses exceed the limit of the responsible party's, when the latter is not responsible under the Act of God doctrine, and when the responsible party is financially unable to meet its obligations, even with its insurance coverage.

On the other hand, it also appears from international practice that the reimbursement obligations of supplementary compensation basically are not waived in cases in which the loss is due to the action of a third party, a natural calamity, or negligent behaviour by states or public authorities. Supplementary compensation also usually has a maximum limit that varies from one international convention to another.

Contribution to supplementary compensation could be established as follows: it could be a percentage of the mandatory amounts collected in respect of each service offered to the users; Member States could contribute to the second tier in proportion to their contributions to the EU budget; Member States could contribute to the second tier in proportion to their contributions to the GNSS Programme. Finally, Member States can contribute to the second tier in proportion to the total turnover of the liable party controlled by each Member State or its nationals.

As for the contribution to and the practical creation of the second compensation tier, the model adopted by the CLC system seems not to be the best solution for a GNSS civil liability regime. Indeed, in the Fund Convention the fund is an autonomous legal

body with its own organisation and rules of administration and therefore its activity is as prompt as possible and is rather costly<sup>123</sup>. Consequently, for a potential GNSS civil liability regime, it seems more appropriate to provide a system in which Member States constitute the second compensation tier by making available a certain amount of their annual budget to be paid only in the event an incident actually occurred and not by depositing their financial contributions in an autonomous legal body.

On a case by case basis, supplementary compensation could provide financial support to a EU Member States liable party, when it offers its services outside the territory of Member States and damage occurs outside Member States territory.

Such support may be provided if the damage is caused by the malfunctioning of the signal or system or the certified end-user equipment and when the non-EU Member State where the damage occurs is not responsible of such malfunctioning and the non-EU Member State agrees to contribute to the Supplementary Compensation Mechanism and its terms and conditions. Such financial support shall not exceed the amount established for the second tier.

### 2.3.13. An example of supplementary compensation in the Montreal Convention, 2 May 2009

Recently, the Convention on Compensation for Damage Caused by Aircraft to Third Party Resulting from Acts of Unlawful Interference was signed in Montreal on 2 May 2009. This Convention provides a two-tier liability system.

The liability of the operator arising under Article 3 shall not exceed the limit established in Article 4 in relation to the aircraft maximum mass (the limits are the same as those provided by Regulation (EC) No 785/2004 for compulsory insurance in the EU). Article 7 of the Convention requires compulsory insurance by the operator. The minimum insurance cover proposed for the operator per event is equivalent to the maximum of the first tier [therefore the

<sup>123</sup> International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (1971 Fund), 16 Oct. 1978, Art 2(2): the fund is recognised in each contracting state as a legal person capable of assuming rights and obligations and of being a party in legal proceedings before courts. Art. 16 et seq., the fund has an Assembly, a Secretariat headed by a Director, and an Executive Committee.



international regulator has taken into full consideration Regulation (EC) No 785/2004].

The Convention provides a two-tier liability system and the second tier of compensation has two basic purposes (Article 18). The first is to increase the amount of compensation available to the victims up to 3 billion Special Drawing Rights for each event, and, the second is to share the financial risk borne by private industry (operators) with air service customers.

The supplementary contribution mechanism envisaged by the Convention includes mandatory amounts collected in respect of each passenger and each tonne of cargo departing on an international commercial flight from an airport in a State Party (Article 12). If a State Party decides also to collect this amount from national flights, supplementary compensation shall be paid also for events caused by national flights in its territory. Supplementary compensation is provided also as assistance in case of events occurring in non-party states.

#### **2.3.14. Provisions for the right of recourse**

The European regulation may provide that the liable party shall have the right of recourse against any person who has caused the damage. This person could be any person or entity who has committed, organised or financed an act of (unlawful) interference which causes a malfunctioning of the GNSS system. Also the supplementary compensation mechanism may allow the right of recourse against any person or entity who has caused damage.

Provisions for the right of recourse restrictions could be provided, for example, for the owner of the GNSS systems, or any entity financing the systems and/or other entities (e.g. ESA) which share responsibilities with the owner, or the manufacturers, if they prove that they have complied with the mandatory requirements in respect of the design of the satellites and their components (including software).



### 3. Summary of the Roundtable and General Workshop Discussion

The three morning presentations were succeeded by the afternoon roundtable, which was moderated by Alfredo Roma, Member of the ESPI Advisory Council, and Kai-Uwe Schrogl, ESPI Director. The roundtable aimed at identifying elements for a European roadmap for Satellite Navigation TPL and counted with the intervention of the main actors in the field: the European Commission, represented by Davis Seité and Giedre Valentaite, ESA, represented by Thierry Herman, Eurocontrol, represented by Caroline Mantl and industry, represented by Walter Vasselli (Finmeccanica). Unidroit was also present at the general discussion, represented by Unidroit Deputy Secretary General Alessandra Zanobetti.

The Roundtable was introduced with the presentation of the European GNSS programme by the representatives of the European Commission followed by a roundtable and a posterior general discussion between the panelists of the roundtable and the audience.

#### *3.1. The EC GNSS programmes and the liability roadmap*

The European Commission initiated the discussion by presenting the EC Satellite Navigation programmes together with the perspectives for a Community liability regime for Satellite Navigation. In this regard, EGNOS was presented as the currently operating satellite navigation system developed by ESA the operation of which has been transferred to the European Commission on 1 April 2009. EGNOS Open Service is expected to commence operations already in late 2009<sup>124</sup> and the European Commission has already entered lease agreements to replace a first EGNOS

<sup>124</sup> EGNOS Safety of Life Service is planned to be operational in mid 2010.

transponder as of 2011. It is also foreseen to launch procurement by summer 2009 to replace the second EGNOS transponder. EGNOS paves the way for GALILEO which is currently in its orbit validation period until 2010 and is planned to be operational in 2013. With this aim already six bidders have been identified for the GALILEO procurement.

With 2013 set as the milestone for the initiation of the GALILEO Operational Phase the European Commission presented the roadmap towards the adoption of a regulation on TPL, which is expected to be adopted by the entry in force of the GALILEO Operational Phase in 2013. The legislative process is set to begin in 2010 with an inter-institutional discussion on the financial aspects of the further exploitation of the European satellite navigation programmes. For this purpose a Communication will be prepared leading to a legislative proposal in 2011 and a final regulation in 2013. In the meantime, EGNOS will be subject to contractual allocation of liability risks. The European Commission clarified that while parallel initiatives may be possible by other institutions, for practical reasons the European Commission is not capable of accelerating the process.

#### *3.2. The feasibility of an international convention*

The presentation by the European Commission was followed by the roundtable where the potential adoption of an international convention on Satellite Navigation related TPL and matters related to an EC regulation were discussed.

The discussion commenced with the presentation of the current state of air traffic in the EU and the increasing risks of accidents. Currently, air traffic liability is regulated by bilateral agreements which originate a heterogeneous landscape in air traffic liability regimes. In this context,



victims of accidents that have occurred in identical circumstances but which are subject to different national jurisdictions may receive different treatment; while victims to one of the accidents are indemnified, victims to the other accident may not. Such situation was presented as a likely scenario in the application of GNSS services and it renders necessary the adoption of an international convention on GNSS TPL as a common international model.

Although many positive elements can be attributed to an international convention, among others, the creation of a common model of liability standards which will be globally applicable, practical factors may lead to consider possibilities other than an international convention. In particular, the current liability regime for outer space, based on the Outer Space Treaty and the Liability Convention, was drafted on the assumption that sovereign states are liquid enough to face unlimited liability; however, this is not the case for private operators, service providers and manufacturers which are subject to limited budgets. The draft of an international convention cannot ignore the limited financial frameworks of private actors and may need a rethinking of space liability regimes by States. This would lead to lengthen an adoption process that is already long by nature.

With EGNOS and GALILEO being imminently operational, the timeframe for adopting a convention on Satellite Navigation TPL seems too long for Europe. On the contrary, the legislative process of an EC regulation is swifter and more appropriate to the calendar of the European Commission for EGNOS and GALILEO. In this regard, the participants to the roundtable conceded that an EC regulation is more expedient and efforts should continue towards a European GNSS TPL regime.

In general, both, an international convention and an EC regulation can be pursued in parallel as they are not exclusive of each other. It was suggested that steps can be taken towards both instruments following the example of the ICAO regional agreements. In both cases a framework providing for a GNSS TPL regime should take into consideration several technical and governance related elements.

### *3.3. Elements to be considered*

Drawing on past experiences, it was stressed that liability must not be passed entirely to private actors. A liability regime must reflect the actual governance scheme of the GNSS services taking account of the public/private share and striking a right balance between the public/private actors at allocating responsibility. Also, the dual character of satellite navigation technologies must be considered as immunity could play a role in cases where security affairs are involved.

The weight of passing entire liability to private actors is particularly relevant in the case of SMEs. Excessive liability burdens are not only unbearable, but are also a deterrent for SMEs to take on GNSS applications/services. Therefore, any liability framework must contain mechanisms adapted to the financial capacity of SMEs.

On a more technical level, the opportunities offered by a system like GALILEO are expected to be wider than only navigation services. The multiple operational possibilities attributed to GALILEO may originate new risks related among others to signal frequency use and interoperability. A suitable liability regime must foresee the occurrence of new types of risks and provide for schemes adaptable to those potential situations.

In addition to covering potential risks, it was also mentioned that a GNSS TPL regime could also be extended to the field of non-navigation applications such as telecommunications. The example of the European Air Traffic Management System was used to illustrate this possibility. The European Air Traffic Management System is an integrated application which combines satellite navigation with satellite telecommunications. Damages caused during the utilization of such integrated application may be attributable also to the satellite telecommunication technology applied. It emerged that the GNSS TPL regime could then be applicable to the satellite navigation technology as the development of a parallel regime may be inefficient.

All in all, the roundtable stressed that an international framework is needed for GNSS TPL issues in Europe but also as a model for other GNSS liability regimes. In this regard it was convened that Europe should work together with other countries to arrive at a suitable regulatory framework for all GNSS systems, including the European GNSS

systems. The two levels of regulations (a European regulation and an international convention) are not exclusive and efforts can be made in parallel. Finally, there is a set of governance and technical issues that must be reflected in the regulatory instruments such

as the public/private share, the role of SMEs and the further extension of the liability regime to other potential risks and satellite based applications.



## 4. Towards a Roadmap for Europe

### 4.1. Goal of the project

The goal of the workshop as the core of the project “Policy aspects of TPL in satellite navigation. Preparing a roadmap for Europe” was to investigate in the perspective for the European institutions and organisations to regulate one of the most important legal aspects, the TPL, for making GNSS systems marketable on a global scale.

### 4.2. Issues to be dealt with

Galileo – the major GNSS system for navigation – will be owned by the European Community. This raises a few questions: Is the EC a State?, can the EC enjoy the “State immunity”? Theoretically, if the EC can act as a State, for some services (Public Regulated Services or Search and Rescue) acting as *acta jure imperii* it can invoke the State immunity, while for others (commercial services or Safety of Life) is rather certain that it cannot invoke the State immunity. But these doubts can probably be resolved by the fact that the system will be operated by a private entity as a concessionaire, as foreseen by the Regulation (CE) 683/2008. This is a first element of uncertainty.

A second element of uncertainty refers to the international jurisdiction. According to existing regulations and conventions, the competent forum to hear a damage claim could be where the event occurred or where the defendant is domiciled. This raises another question: which is the applicable law? Is it that of the State where the incident occurred (*lex loci delicti*)? But the place of tort could be either where the tortfeasor acted or where the victim suffered damage. There is no doubt that all these situations of uncertainty make it difficult or impossible for the victim to receive compensation for the damage suffered.

While the positioning systems are becoming more and more important for economical

activities, at the moment there is not a specific legal framework; therefore these activities are ruled now by applicable national laws. GNSS systems employ new technologies which present a certain degree of risk. This risk needs an international comprehensive legal framework to ensure an adequate and uniform compensation for persons who suffered damage caused by a system malfunctioning.

During the discussions among ICAO, ECAC, EUROCONTROL and UNIDROIT, three approaches have been identified: one based on existing domestic law, one proposing a contractual approach accompanied by a framework agreement and a wide approach which believes that a universal liability regime or conventional should be set up.

To secure confidence in the system by the States which have to authorise the use of the signal and by the private sector prepared to invest in system, we need a binding international legal instrument like an international convention based on a mandatory and uniform liability regime, a strict liability channelled towards one party only, and a compulsory insurance combined with a compensation fund.

The proposed arrangement of a Framework Agreement could only be an “interim solution” to create a readily available instrument, but it does not appear appropriate for managing the TPL issue, also considering the indefinite number of such bilateral Agreements that should be negotiated among the 190 ICAO Member States.

### 4.3. Approach to be taken

The TPL issue should be ruled as soon as possible with an EU Regulation, proceeding at the same time for an International Convention. The route towards a GNSS regulation for TPL goes through an EU

Regulation that could settle the matter for 27 countries; while the procedure for an international convention will be started, the instrument of Framework Agreement can be utilised between EU and third countries or between ICAO Member States. Considering

that EGNOS should be operational within 2009 and that in 2010 the selection of a concessionaire starts, the TPL issue should have a regulation by 2010 and not by 2013.



## List of Acronyms

<b>A</b>	
ATM	Air Traffic Management
<b>C</b>	
CS	Commercial Services
CNS	Communication, Navigation and Surveillance
<b>E</b>	
EC	European Community
ECAC	European Civil Aviation Conference
EGNOS	European Geostationary Overlay Service
ESA	European Space Agency
ESPI	European Space Policy Institute
EU	European Union
Eurocontrol	European Organisation for the Safety of Air Navigation
<b>F</b>	
FANS	Future Air Navigation Systems
FOC	Full Operational Capability
<b>G</b>	
GLONASS	Global Navigation Satellite System
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
<b>I</b>	
ICAO	International Civil Aviation Organisation
IOV	In Orbit Validation
<b>K</b>	
KPI	Key Performance Indicators
<b>L</b>	
LTEP	Legal Technical Expert Panel
<b>O</b>	
OS	Open Service
<b>P</b>	
PRS	Public Regulated Service
<b>S</b>	
SAR	Search and Rescue Service
SoL	Safety of Live Service
<b>T</b>	
TPL	Third Party Liability
<b>U</b>	
Unidroit	International Institute for the Unification of Private Law

Workshop Programme

## ESPI Workshop

Programme



**Policy Aspects of Third Party Liability  
in Satellite Navigation -  
Preparing a Roadmap for Europe**

ESPI, 15 May 2009  
Vienna, Austria



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March 2009

## Policy Aspects of Third Party Liability in Satellite Navigation - Preparing a Roadmap for Europe

ESPI, 15 May 2009  
Vienna, Austria

### Background

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The development of new GNSS (e.g. Galileo, GPS III, Glonass, Compass-Beidou) and partly the augmentation systems (Egnos and Gagan) will certainly create dedicated services for air navigation under satellite control. They represent an evolution and a substantial improvement of the satellite radionavigation systems currently existing. Considering the GNSS's potential global scope, the risk of loss is significant and may even be catastrophic.

The absence of an international uniform law causes a number of problems. Such problems include the risks of multiple applicable jurisdictions, the difficulty and costs of identifying the responsible party, uncertainty relating to the notion of reimbursable loss, the introduction of effective loss recovery mechanisms, and difficulties in coordinating with existing convention regimes.

In such circumstances, due to the absence of uniform international legislation, many difficulties could arise in the effort to solve legal problems. It is evident that such a complex legal framework can not be solved through the adoption of bilateral agreement (so called 'Contractual framework'). This instrument aimed at regulating public law and private law arrangements between the various stakeholders is unable to guarantee a uniform applicable law and, therefore, an efficient system to assure a reasonable and harmonized compensation to the victims. The international practice regarding the regulation of civil liability, especially in case of catastrophic events, has taught us that the responsibility of the liable party has to be regulated by international convention.

An international negotiating process has recently been launched by Italy involving the International Institute for the Unification of Private Law (UNIDROIT). This ESPI Workshop shall support this process through investigating the policy aspects of drafting and implementing such an international convention and develop a common European stand and position by formulating a roadmap.



### Programme

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**10:30-10:45 Welcome and Introduction by the Co-Chairs**

Prof. Dr. Alfredo Roma (Member of the ESPI Advisory Council and Consultant for the Aerospace Industry) / Prof. Dr. Kai-Uwe Schrogl (Director, ESPI)

**10:45-13:00 Presentations: Policy Perspectives**

*The Present State of Third party Liability in Satellite Navigation and Its Shortcomings*  
Prof. Dr. Ulrich Magnus (Max-Planck-Institut für ausländisches und internationales Privatrecht, Hamburg)

*The Rationale for an International Convention on Third Party Liability in Satellite Navigation*  
Prof. Dr. Sergio Maria Carbone (University of Genoa)

*GNSS: The Basic Principles for a European Legal Framework on Third Party Liability*  
Prof. Dr. Anna Masutti (University of Bologna)

**13:00-14:00 Buffet Lunch**

**14:00-15:00 Roundtable: Elements for a European Roadmap**

Mrs. Catherine Kavvada (European Commission)  
Mr. Roederick van Dam (Eurocontrol)  
Dr. Marco Ferrazzani (European Space Agency)  
Dr. Walter Vasselli (Finmeccanica)  
with the Co-Chairs as moderators

**15:00-16:00 General Discussion and Conclusions by the Co-Chairs**





## About the Contributors

**Prof. Avv. Sergio M. Carbone** is the Director of the Institute of International and Maritime Law at the University of Genoa since 1979 and has been lecturer at the Hague Academy of International Law since 1980. Since 1977 he is admitted to plead before the Supreme Court of Cassation (Italian Supreme Court); during his career he has been counsel for important Italian industrial groups in matters like civil law, business international law, contract law and corporation and bankruptcy law and has also offered contractual, business as well as investment planning and financing counsel to public authorities. He has been lawyer and legal adviser expert in judicial and arbitral proceedings and has been Chairman as well as sole arbitrator in numerous arbitral proceedings under the rules of ICC, UNCITRAL and AIA. Sergio Carbone is author of several articles related to international trade, public and private international law, European Union law, international shipping and ocean Carriage. He has also published numerous books in the field of his expertise; the most recent are "Il diritto marittimo" (3<sup>rd</sup> ed. Torino, Giappichelli, 2006), "Lo spazio giudiziario europeo" (5<sup>th</sup> ed., Torino, Giappichelli, 2006) and "La disciplina dei porti tra diritto comunitario e diritto interno" (Milano, Giuffrè, 2006). Sergio Carbone is Past-President of Finmeccanica S.p.A., Member of the Governing Council of Unidroit, legal adviser of the Italian Foreign Office and the Ministry of Transport; he contributes to the Centro di Solidarietà in Genoa and since 2007 he is member of the Board of Director of the Banca Carige Foundation.

**Prof. Dr. Ulrich Magnus** is professor of Law at the University of Hamburg and chairs the department of Civil Law, Private International Law and Comparative Law where he is professor emeritus (and still reading) since 2009. He is author of 20 books and almost 200 articles in the field of his expertise. Ulrich Magnus is Executive Vice-director of the European Centre for Tort and Insurance Law in Vienna, he is also Germany's National Correspondent at UNCITRAL (United Nations Commission on International Trade Law) and Director of the International Max-Planck-Research School of Maritime Affairs in

Hamburg. Ulrich Magnus is member of several International and European Law groups such as the German Council for Private International Law, the European group on Tort Law and the European Acquis Group. In parallel he also serves as Legal Expert for international organisations such as UNCITRAL, UNIDROIT, IAEA, FIFA as well as for national governments such as the Government of Bulgaria and of the Czech Republic and for German ministries and German foreign courts.

**Prof. Dr. Anna Masutti** is Professor of Air Law at the University of Bologna, Faculty of Engineering, where she lectures Aerospace Law and Commercial Law. She is furthermore a member of the scientific committee of the Master in Aviation Sciences at the University of Bologna, and director of the Summer school in Aviation Management. As well as being a member of the Bologna Bar, Anna Masutti has been a Member of the Technical, Economic and Legal Committee of ENAC (the Italian Civil Aviation Authority) since 2002, and of the Technical and Scientific Committee for the implementation of the Monitoring Project - Land Surveying and Civil Engineering as part of the development program for the Galileo Satellite Project, which is funded by the European Union and the European Space Agency (ESA) and Member of the European Centre of Space Law (ECSL). Anna Masutti is senior partner at AS&T Law firm, which offers a comprehensive range of legal services specialising in aviation, aerospace, marine, transport, insurance, international trade and commerce, and European Union Law. She is furthermore part of the professionals cooperating for the definition of the legal scenario of the European projects Galileo EGNOS and SESAR (SWIM) and for the employment of Unmanned Air System (UAS). Anna Masutti has been a frequent speaker in national and international seminars. She is the author of various books on Air Law and contributes to a number of reviews including "Air and Space Law", "Diritto dei Trasporti", "Il Diritto Marittimo", and is the founder and Director of "The Aviation and Maritime Journal" of Bologna University.



**Prof. Alfredo Roma** is consultant for the aerospace industry and member of the Advisory Board of ESPI (European Space Policy Institute) in Vienna. Previously he was the National Coordinator for the Galileo Project in the Italian Prime Minister Cabinet as well as the Italian Delegate to the European Space Agency (ESA). Until 2003, Alfredo Roma held the chairmanship of the Italian Civil Aviation authority (ENAC) for a period of five years and was the president of the European Civil Aviation Conference (ECAC) since 2000. During this period he also formed part of the Single Sky High Level group set up by the former European Transport Commissioner Loyola de Palacio. In his previous career Alfredo Roma has been Managing Director and CEO of Agenzia ANSA Rome and also Chairman of three renowned international agencies: the European Alliance of Press Agencies, the Mediterranean Alliance of Press Agencies and the European Press Photo Agency. At his earliest career he was successively Director of Finance and Control then Director of International operations and finally Managing Director and CEO of Edizioni Panini Spa and Director of Finance and Human Resources of Ceramica SAIME Spa as well as Deputy Manager of the Foreign Department and responsible for international transactions at Banca Popolare dell'Emilia Romagna. Alfredo Roma holds a degree in Economics at the University of Modena and has been untenured professor of business finance at the Faculty of Economics at the University of Modena; lecturer on the master's courses in business management at Profingest – Bologna, Sinnea and LUISS. At present he co-operates as a teacher with the University of Tor Vergata for the Master Courses in Antitrust and Competition and with the Bologna University for the Master Courses in Aviation Science. He regularly publishes articles on national law and economic reviews (University of Rome and Bologna) and in major Italian newspapers and magazines.

**Matxalen Sánchez Aranzamendi, Adv. LLM** is Project Manager at the European Space Policy Institute (ESPI) in Vienna, Austria since 2008. She has specialised in European Integration and owns an Advanced LLM in European Business Law. Before joining ESPI she had dealt with EC Space Policy and GMES matters during her internship at the European Commission and previously she had been a Junior Policy Advisor for the Delegation of the Basque Country in Brussels where she dealt with EC Transport Policy and Galileo matters.

**Prof. Dr. Kai-Uwe Schrogl** is the Director of the European Space Policy Institute (ESPI) in Vienna, Austria since 2007. Before, he was Head Corporate Development and External Relations Department in the German Aerospace Center (DLR). In his previous career he worked with the German Ministry for Post and Telecommunications and the German Space Agency (DARA). He has been delegate to numerous international forums and recently served as the chairman of various European and global committees (ESA International Relations Committee, UNCOPUOS working groups). Kai-Uwe Schrogl has published nine books and more than 100 articles, reports and papers in the fields of space policy and law as well as telecommunications policy. He is editor of the "Yearbook on Space Policy" and the book series "Studies in Space Policy" both published at SpringerWienNewYork as well as member in editorial boards of international journals in the field of space policy and law (Acta Astronautica, Space Policy, Zeitschrift für Luft- und Weltraumrecht, Studies in Space Law/Nijhoff). Kai-Uwe Schrogl is Member of the Board of Directors of the International Institute of Space Law, Member of the International Academy of Astronautics (chairing its Commission on policy, economics and law) and the Russian Academy for Cosmonautics. He holds a doctorate degree in political science, lectures international relations at Tübingen University, Germany (as a Honorarprofessor) and has been a regular guest lecturer i.a. at the International Space University and the Summer Courses of the European Centre for Space Law.



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Through its activities, ESPI contributes to facilitate the decision-making process, increases awareness of space technologies and applications with the user communities, opinion leaders and the public at large, and supports students and researchers in their space-related work.

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