

# **esa INTERNATIONAL SUMMER SCHOOL ON GNSS**

## **LIABILITY ISSUES IN GNSS**

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# OVERVIEW

- **Introduction**
- **Potential sources of errors**
- **Jurisdiction and Applicable law**
- **Liability at system level**
- **Product liability in EU Topic**
- **Liability under the Outer Space Treaties**
- **Domestic Laws**
- **Conclusion – liability at system level**
- **EGNOS as an example**

## **Liability issues in GNSS**

- **Given the many GNSS applications erroneous GNSS data could cause serious damage.**
- **This erroneous data is not necessarily due to a malfunctioning of the system itself. In reality the data the end-user is using is processed data based on the emitted GNSS signals. Liability will depend on where the error responsible for damage was introduced?**

## **A Basic principle**

### **Two approaches fault-based or strict liability:**

- **For fault based liability the claimant must prove (i) the damage (ii) the negligence of the defendant and (iii) the causal link between the two.**
- **For strict liability (absolute liability) the claimant would only have to prove their damage and the causal link**

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## casus

- **Imagine a ship using GNSS for entering a port under very bad weather conditions. The ship enters in collision with a wharf causing serious damage to the port infrastructure and the ship itself.**
- **The port authorities will sue the ship owner. The ship owner (captain) pretends that the accident was caused by wrong indications given by the GNSS receiver. The chain of events leading to the accident is crucial for determining liability.**

# Potential Sources of error

- Sources of error at system level
- Sources of error at receiver level
- Sources of error at application level
- Sources of error at user level

# Sources of error at system level

- **Main errors sources**
  - Satellite orbit – upload of wrong data (almanac ephemeris etc)
  - Satellite clock – drift and wrong prediction
  - Insufficient number of satellites
  - Bad signal shapes
  - System updates



# Sources of error at receiver level

- **Main error source**
  - Receiver noise
  - Software bugs
  - Multipath
  - interference

# Sources of error at application level

- **Main error at application level**
  - **Errors introduced at service provider level**
  - **Errors due to specific application software e.g. maps**

## Sources of error at user level

- **Main errors attributable to the user**
  - Inadequate choice of receiver for specific application
  - Not respecting the manufacturer guidelines for use and maintenance

# Casus

- **The instructions to the captain were based on:**
  - GNSS signal in space
  - Signal received and processed by receiver.
  - Use of maps
  - Use of local service provider for navigation aids for this port

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## **Jurisdiction and Applicable law**

- **In GNSS the “G” stands for Global meaning that damages could occur everywhere on Earth. Jurisdiction and Applicable law will be defined through international private law e.g. through connecting factors which ultimately might result in the domestic law of any State in the world.**

## Jurisdiction in EU (1)

The determination of the competent courts are determined through the application of Regulation (EC) No 44/2001 (Brussels I), which replaced the 1968 Brussels Convention.

- Brussels I only applies to civil and commercial matters; administrative matters are expressly excluded. In principle, Brussels I applies as soon as the defendant is located within the EU territory (irrespective of his/its nationality), even if the claimant is domiciled in a third country, except where provided otherwise in Article 22 (*in Rem*)

## Jurisdiction in EU (2)

- The *actor sequitur forum rei* rule retained in Brussels I means that jurisdiction shall in principle be granted to the courts of the Member State where the defendant is domiciled (Article 2 of Brussels I).
- Under Brussels I, a company is domiciled at the place where it has its statutory seat, central administration or principal place of business (Article 60 of Brussels I).
- For a natural person domicile should satisfy the conditions of the *lex fori*.



## **Jurisdiction in EU (3)**

- **In case of non-contractual obligations (tort/delict), the defendant may also be sued in the courts of the Member State where the harmful event occurred or may occur (Article 5(3) of Brussels I). This includes the place where the event triggering the damage has happened as well as the place where the damage has occurred.**

## **Applicable Law in EU (1)**

- **When a Court of a Member State was found to have jurisdiction pursuant to Brussels I, the law applicable to non-contractual obligations will be determined pursuant to Regulation (EC) No 864/2007 (Rome II).**

## **forum**

- **Domicile of defendant or**
- **Place where harmful event occurred or was triggered**
- **Next step applicable law**

## Applicable Law in EU (2)

- **In application of Rome II, the law applicable to a non-contractual obligation (tort/delict) is the law of the country in which the damage is sustained, irrespective of the country or countries in which the event giving rise to the damage occurred and irrespective of the indirect consequences of that event (Article 4(1)), (ad variance with choice of forum) typical examples pollution, internet, outer space.**

## Applicable Law in EU (3)

- **Article 17**

- Rules of safety and conduct

**In assessing the conduct of the person claimed to be liable, account shall be taken, as a matter of fact and in so far as is appropriate, of the rules of safety and conduct which were in force at the place and time of the event giving rise to the liability. In particular relevant for road accidents.**

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## **Liability at system level**

- **Liability issues due to a malfunctioning of the GNSS itself resulting in damages.**
- **Claimants could seek compensation from all those involved in the provision of the GNSS signal i.e. the designer, manufacturer, launch provider, operator etc**

## Potential actors (e.g.)

- **Signal performance management entity:**  
The signal performance management entity is in charge of defining the navigation signals *inter alia* in order to satisfy the user needs as defined by Service providers.
- **System operator:**  
The system operator operates on a continuous basis the Navigation constellation including space and ground segments for providing a signal as defined by the signal performance management entity.
- **Service providers:**  
Service provider is using either directly or indirectly (after processing) the navigation signal in order to enable users to use it for a given purpose. The Service providers are giving feedback to the signal performance management entity on user requirements.



# Potential avenues v. system

- **Product Liability**
- **Outer Space Treaties**
- **National Space Laws**

# Product liability in EU

- **Article 5**
- **Product liability**
- **1. Without prejudice to Article 4(2), the law applicable to a non-contractual obligation arising out of damage caused by a product shall be:**
- **(a) the law of the country in which the person sustaining the damage had his or her habitual residence when the damage occurred, if the product was marketed in that country; or, failing that,**
- **(b) the law of the country in which the product was acquired, if the product was marketed in that country; or, failing that,**
- **(c) the law of the country in which the damage occurred, if the product was marketed in that country. i.e. the lex loci delicti damni does not apply! (lex loci delicti damni v. lex loci commissi)**

# Product liability in France <sup>(1)</sup>

- any movable, even though incorporated into an immovable, including the products of the soil, of stock-farming, of hunting and fishing. Electricity shall be deemed a product.
- 101 Article L.2111-17 of the General Code governing Public Persons' property provides as follows: "Radio electronic frequencies available on the territory of the [French] Republic are part of the State's public estate" .

# Product liability in France <sup>(2)</sup>

- If courts would consider by analogy satellite signals as frequencies then the Operator's liability could not be triggered under the "defective product" regime for damages caused by satellite signals since immovable are not considered as products and fall outside its scope.

# Product liability in France <sup>(3)</sup>

- Unlike radio frequencies, electricity is explicitly defined as a product by the FCC (Article 1386-3). Electricity and satellite signals do share a number of common characteristics: both are composed of immaterial waves susceptible of causing damage.

# Product liability in France <sup>(4)</sup>

- For some authors, the fact that electricity was expressly included in the definition of a "product" prevents implicit interpretation of the statute and judicial widening of the definition to similarly debated items by analogy, pursuant to the principle of *expressio unius est exclusio alterius* contrary, other academic publications consider that the inclusion of electricity allows further widening of the definition of the term "product" under the Directive and the FCC.

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# OST article VI

- States Parties to the Treaty shall bear **international responsibility for national activities** in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty.

**The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.** When activities are carried on in outer space, including the Moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.



# OST article VII

- Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the Moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is **internationally liable for damage to another State** Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the Moon and other celestial bodies.

# Liability Convention

## article I (b) and (c)

- The term “launching” includes attempted launching;
- The term “launching State” means:
  - (i) A State which launches or procures the launching of a space object;
  - (ii) A State from whose territory or facility a space object is launched;

# Liability Convention

## article I (d)

- The term “space object” includes component parts of a space object as well as its launch vehicle and parts thereof.

# Space object

- The Australian Space Activities Act reads:
- “Space object means a thing consisting of:
  - (a) A launch vehicle; and
  - (b) A payload (if any) that the launch vehicle is to carry into or back from outer space; or any part of such a thing, even if:
  - (c) The part is to go only some of the way towards or back from outer space; or
  - (d) The part results from the separation of a payload or payloads from a launch vehicle after launch.”
-

# Space object

- **Belgian law on the activities of launching, flight operations or guidance of space objects, Art.3, 1° "space object" means any object launched or intended to be launched into outer space, including the material elements composing that object."**

## Conclusion

- **GNSS signals cannot be assimilated to space objects – the liability convention is therefore not applicable to damage caused by the use of GNSS signals.**

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## Domestic Laws - France

- **"Damage" means harm to people, goods, including public health and the environment, directly caused by a space object in the framework of a spatial operation, and excluding the consequences of the use of the signal emitted by such space object for the users (Titre 1, Article 1).**



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# **Conclusions – liability in case of damage caused by the system itself**

- **Probability that Product liability applies is very low.**
- **OTS art. VI and VII apply (State responsibility).**
- **Liability Convention does not apply.**
- **Domestic laws e.g. FR excludes damage caused by the use of signals emitted by a space object.**
- **Main avenue – tort**

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# EGNOS Exploitation

- EGNOS offers all users of satellite radio navigation high-performance navigation and positioning services, superior to that currently available in Europe. The three services available are:
  - Open Service
  - Safety-of-Life Service
  - EGNOS Data Access Server (EDAS)

## **EGNOS Exploitation (2)**

- **On 1 April 2009, ESA has transferred the property of EGNOS to the EC.  
The European Commission has, consequently, assigned the service provision of EGNOS Signal to a private company i.e. the ESSP.**

## ESSP Structure

- **The ESSP - SAS (European Satellite Services Provider) is since 2008 a company of limited liability. Its shareholders are 7 key European Air Navigation Service Providers (ANSPs), which were also members of the EGNOS Operator and Infrastructure Group.**
- **The ESSP members are:**
  - \* **AENA (Spain)**
  - \* **DFS (Germany)**
  - \* **DGAC/DSNA (France)**
  - \* **ENAV (Italy)**
  - \* **NATS (United Kingdom)**
  - \* **NAV (Portugal)**
  - \* **Skyguide (Switzerland)**

## ESSP MISSION

- **The ESSP mission is the provision of the EGNOS Open Service (OS) and Safety of Life (SoL) Service compliant with ICAO SBAS standards and recommended practices throughout the European Civil Aviation Conference (ECAC) Region**

## ESSP Services

- **EGNOS Open Service, the signal-in-space is continuously available since October 2009.**
- **EGNOS Open Service provides unprecedented positioning precision by improving the accuracy of GPS. The signal is available free.**
- **As from 2011 the ESSP will be certified in compliance with the Single European Sky regulations and consequently EGNOS will be available for the Safety-Of-Life Service.**



## ESSP Services

- EGNOS is also providing a terrestrial commercial data service: EDAS (EGNOS Data Access Service). EDAS disseminates EGNOS data in real-time and is the single point of access for the data collected and generated by the EGNOS infrastructure. EDAS allows users to "plug in" to EGNOS by providing access to satellite navigation data generated by ground stations distributed over Europe and North Africa.
- EDAS is now offering a free 12-month beta trial from April 1, 2009 to March 31, 2010. The trial is open, on application, to companies who plan to exploit it to develop precision location-based services for the market.

# ESSP – EC Disclaimer

## Disclaimer

- **The European Union, as the owner of the EGNOS system and ESSP SAS as its operator expressly disclaim all warranties of any kind (whether expressly or implied), including, but not limited to the warranties regarding availability, continuity, accuracy, reliability, fitness for a particular purpose or meeting the users' requirements. No advice or information, whether oral or written, obtained by a user from the European Union or ESSP SAS shall create any such warranty.**
- **By using the EGNOS SIS, the user agrees that neither European Community nor ESSP SAS shall be held responsible or liable for any direct, indirect, incidental, special or consequential damages, including but not limited to, damages for interruption of business, loss of profits, goodwill or other intangible losses, resulting from the use of, misuse of or the inability to use the EGNOS SIS.**

## **Liability – other than system**

**Main avenue will be product liability**

**Liability requires that the defect is the proximate cause for the damage**

- **Either negligence in design**
- **Errors during manufacturing process**
- **In-adequate design for given purpose**
- **The defect must exist when the device leaves the production area.**

# TITLE

- **Topic 1**
  - **Topic 2**
    - **Topic 3**