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GNSS applications – Legal implications

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Overview

- Legal implications

↔ Legal & institutional framework

  - The aim of this module is to allow participants to understand the general legal implications of using GNSS for downstream applications, by introducing the legal framework for GNSS operations, signal and service provision and the governance structures in a few reference cases highlighting the legal relationships between key stakeholders, using aviation as an example and the issue of liabilities as a case study.

Roadmap

- General international legal framework
- Institutional frameworks GNSS
  - GPS, GLONASS, EGNOS & Galileo
- Legal & institutional frameworks aviation
- Liability as case study of legal implications
  - International sector-specific liability regimes
  - Two general national liability regimes

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General framework

- No global regulatory organisation

←→ General int'l law applies

- ➢ Law of treaties w/r/t agreements on GNSS
- ➢ Rules on development customary int'l law

→ Key role states ←→ IGOs & private operators

Note: Both 'upstream' and 'downstream'

- ➢ Includes set of special international law regimes
  - ◆ Upstream & downstream: e.g. IPR on patents, copyrights conductor topology
  - ◆ Only downstream: e.g. WTO on access to GNSS services

Upstream (1)

1. International space law (1)

- 1967 Outer Space Treaty
  - Freedom of use of outer space (Artt. I, II)
    - For benefit of all states
  - Within parameters general int'l law & UN Charter (cf. also Art. III)
    - E.g. use of force, international cooperation
  - State responsibility for violations int'l obligations
- 1972 Liability Convention
  - Launching state(s) jointly & severally liable for damage caused by space objects (Artt. I(c), II-V)
    - State launching, procuring, lending territory or facility for launch

Upstream (2)

1. International space law (2)

- 1972 Liability Convention – *ctd.*
  - Absolute liability on earth ←→ fault liability in space (Artt. II, III)
  - Physical damage to humans / property (Art. I(a))
    - Caused by space object through collision
    - Excludes indirect damage, loss of revenue
  - Compensation in principle unlimited (Art. XII)
- 1975 Registration Convention
  - National register of launching state (Art. II)
  - Information from launching state to UN OOSA for international register (Art. IV)

Upstream (3)

2. International telecommunications law

- Also GNSS needs satellite frequencies & orbits
- ➔ ITU regime; 2/3 step regime for coordination
  1. Allotment of frequency bands to types of services
     - In accordance with principles ITU Constitution & Convention, as included in Radio Regulations
     - Revisited by 3-4 yearly World Radio Conferences
  2. Allocation of frequencies to specific systems
     - Following coordination ➔ inclusion in MIFR
     - To ***states*** – not IGOs or private operators
  3. Assignment to actual IGO / private operator

Note: Also applies to downstream usage

GNSS governance

➔ No coherent, monolithic legal framework for GNSS

←→ Individual operators GNSS

- So far states
  - Directly 'accountable' under international law'

Note 1: In Europe key involvement IGOs: EU & ESA

Note 2: Possible involvement private operator Galileo

- Largely determine 'their own' governance & legal framework

←→ Only 'limited' by applicable int'l (space) law

Legal framework(s)

- ➔ No coherent, monolithic legal framework for applications either
- ←→ Legal frameworks per sector
  - Aviation (*as the example*); maritime; rail; road; telecoms; banking; tourism services …
  - Not specifically focused on involvement GNSS
  - Main Qs always: ***Do they apply? Could they apply? Should they apply?***
  - Essentially 2 levels
    - Global & domestic (& European where applicable)

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Why aviation?

1. Sector earliest to recognise potential benefits from GNSS & to use GNSS
   - Some current augmentation systems 'officially' focused on aviation applications
2. Most safety-sensitive → regulated
   - Most elaborate nat'l **&** int'l framework, dealing e.g. with certification & liability issues & providing specific & elaborate requirements

←→ Main analysis also applies to other application sectors

Three case studies

1. GPS
2. GLONASS

= Simply because they are operational

1. EGNOS / Galileo
   - Not run by military authorities ➔ willingness for acceptance of specialised legal regime
   - Presents complexities – IGOs involved
   - Wishes to offer services against fees & with guarantees & liability acceptance

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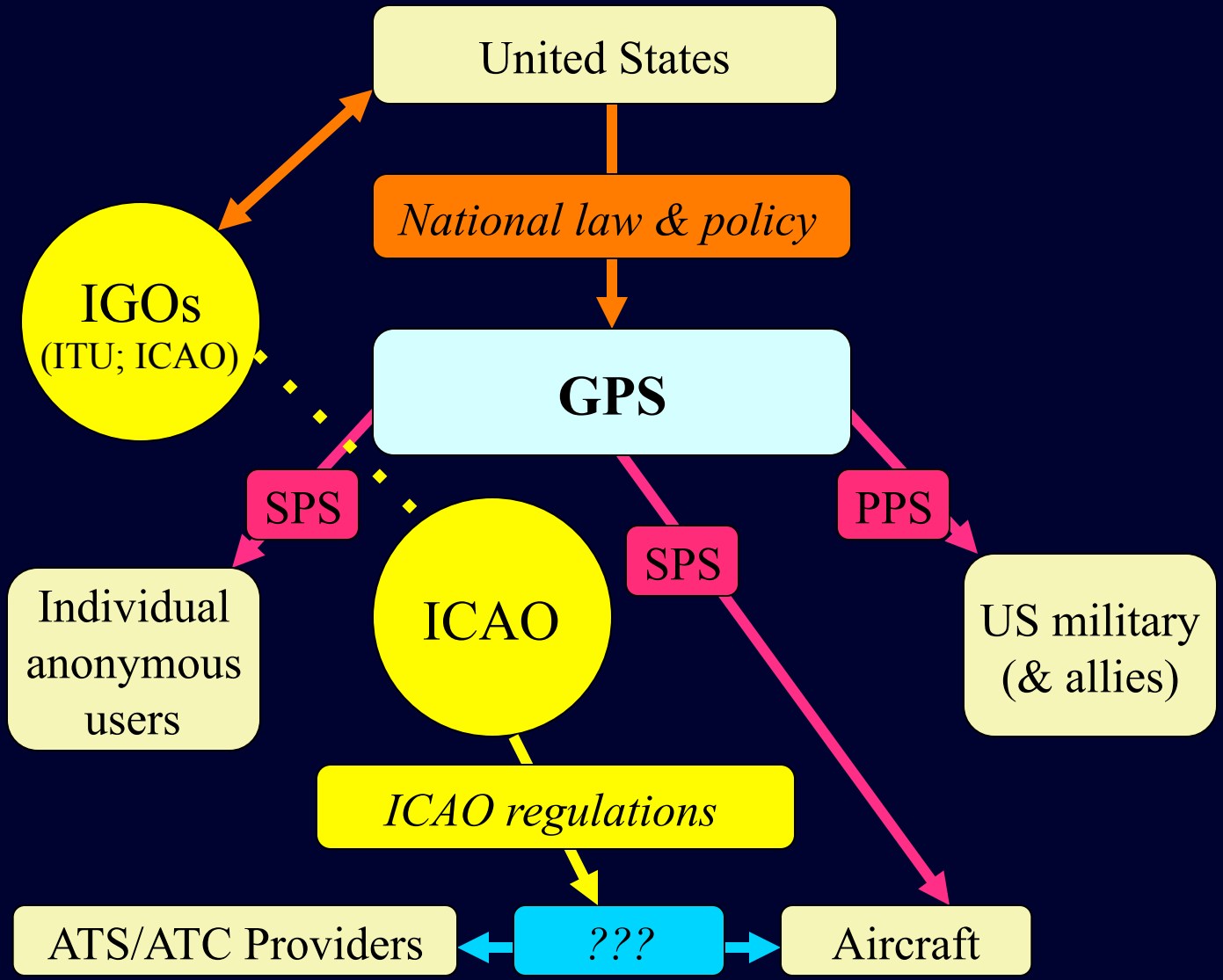
GPS (1)

- Owned & operated by DoD (USAF)
- US Space-Based PNT ***Policy***, per Presidential Directive 2004
  - SPS for free – & 'politically guaranteed'
    - However, export controls applied to receivers
  - National Executive Committee for Space-Based PNT: high-level body to ***advise*** & coordinate US departments & agencies on GPS / GNSS
  - WAAS & LAAS developed, owned & operated by DoT / FAA

GPS (2)

- National Executive Committee
  - Co-chaired DoD & DoT, incl. DoC & 6 other executive branches
  - Provides top-level guidance to agencies on GPS-related issues, incl. program budgeting, international strategy & interference mitigation
  - DoC represents interests commercial & civil GPS communities
    - All private sector GPS users, manufacturers & service providers

GPS Legal / Functional Model & aviation



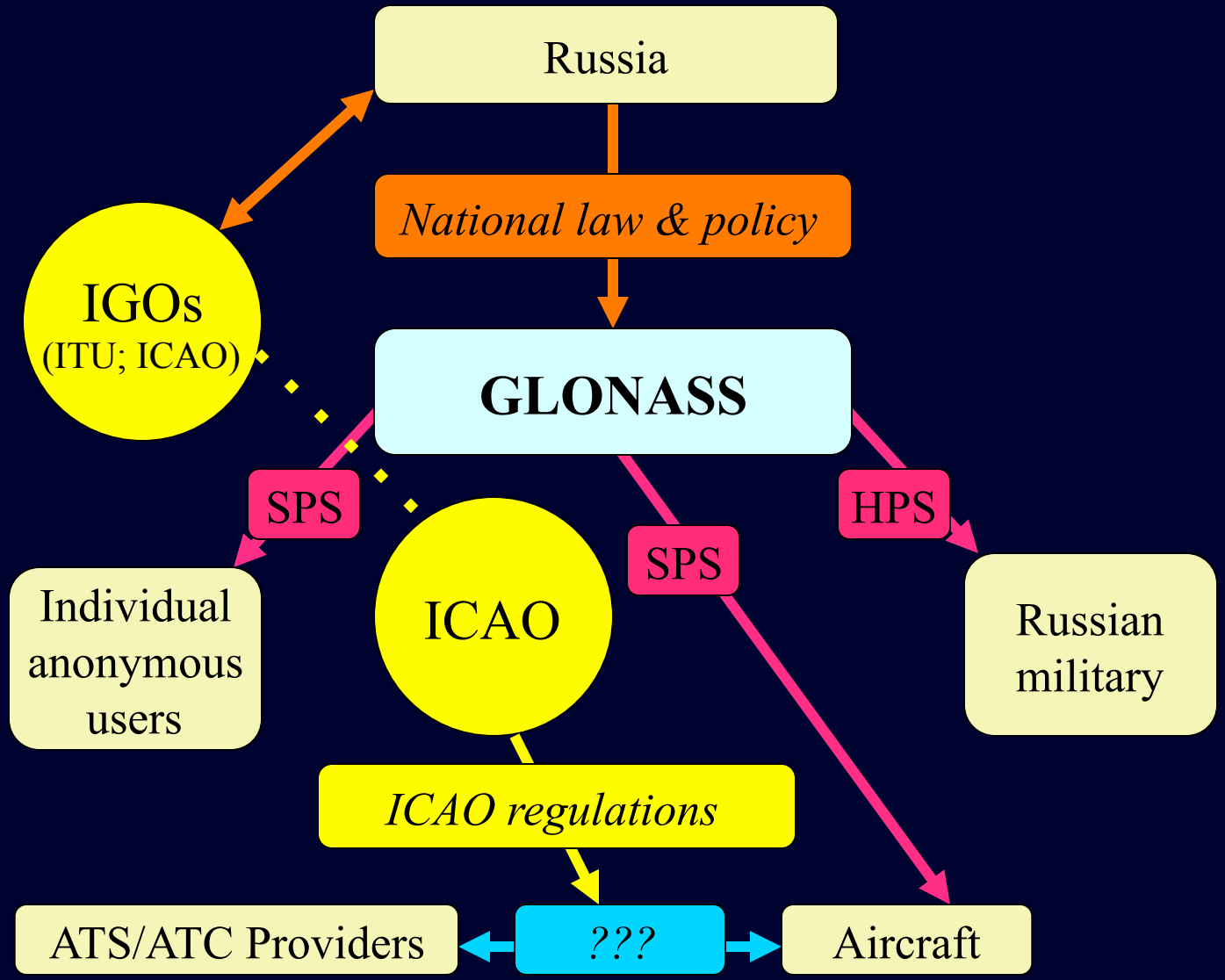
Legend

GPS = Global Positioning System
IGOs = InterGovernmental Organisations
ITU = International Telecommunication Union
ICAO = International Civil Aviation Organisation
PPS = Precise Positioning Signal
US = United States
SPS = Standard Positioning Signal
ATS = Air Traffic Services
ATC = Air Traffic Control

GLONASS

- Operated & owned by Russian MoD
  - Russian Space Forces
  - Launches undertaken by Russian Space Agency
- 2007 decree: confirms open & free access for Russian & foreign consumers to SPS
  - Russian Space Agency directed to coordinate work to ensure availability civil & commercial needs

GLONASS Legal / Functional Model & aviation



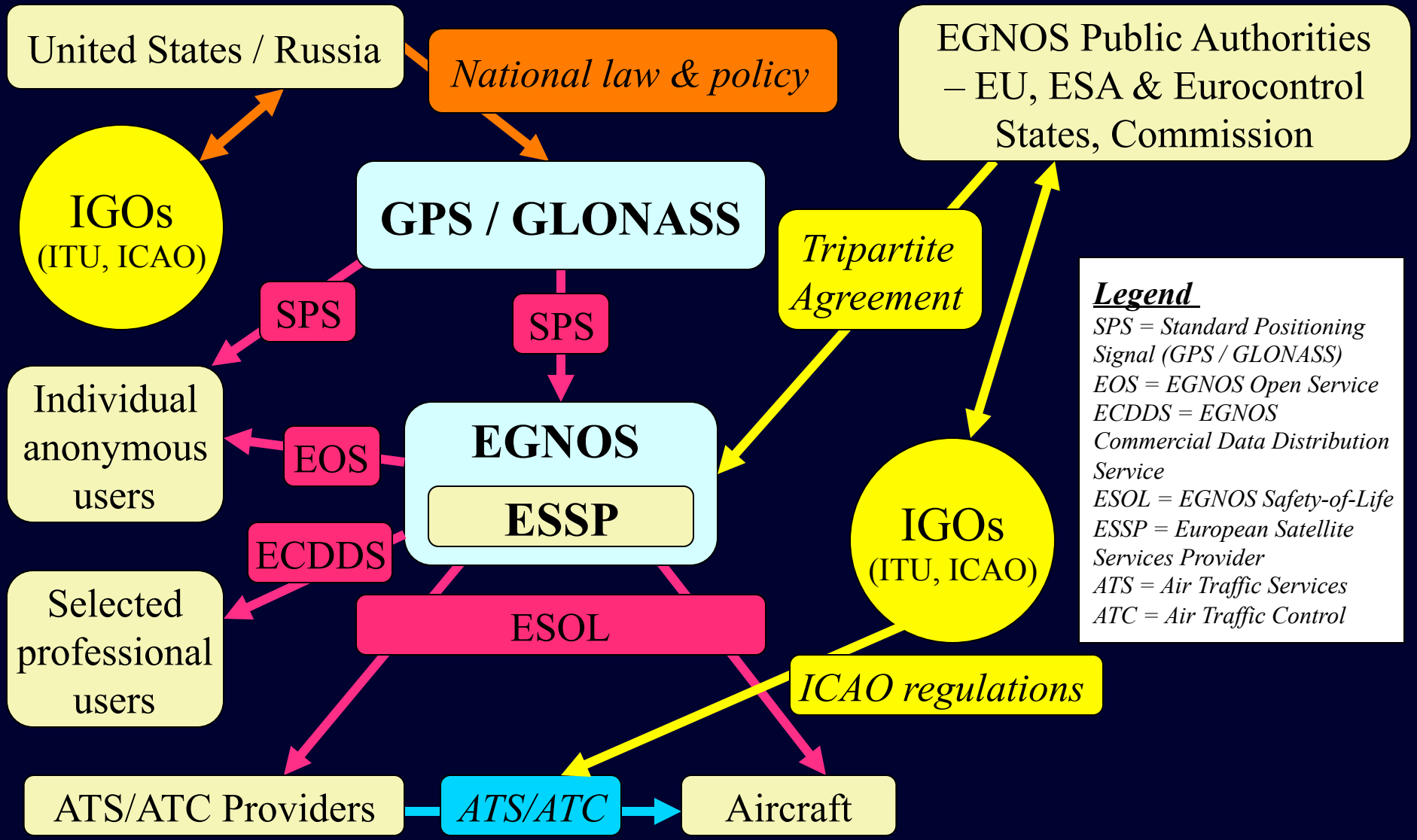
Legend

GLONASS = Global Orbiting Navigation Satellite System
IGOs = InterGovernmental Organisations
ITU = International Telecommunication Union
ICAO = International Civil Aviation Organisation
HPS = High-precision Positioning Signal
SPS = Standard Positioning Signal
ATS = Air Traffic Services
ATC = Air Traffic Control

EGNOS

- Owned & managed by EU (IV/2009)
  - ESA design & procurement agent
  - ESSP manages operations (until 2013)
    - HQ Toulouse (since 2008) – French company
    - Joint venture AENA (Spain), DFS (Germany), DSNA (France), ENAV (Italy), NAV Portugal & Skyguide (Switzerland)
  - Ground stations – mostly, not all in Europe / EU
    - 34 Ranging and Integrity Monitoring Stations (RIMS)
      - Later 7 additional RIMS mainly in MEDA region
    - 4 Master Control Centres (MCC)
    - 6 Navigation Land Earth Stations (NLES)

GPS/GLONASS+EGNOS Legal / Functional Model & aviation

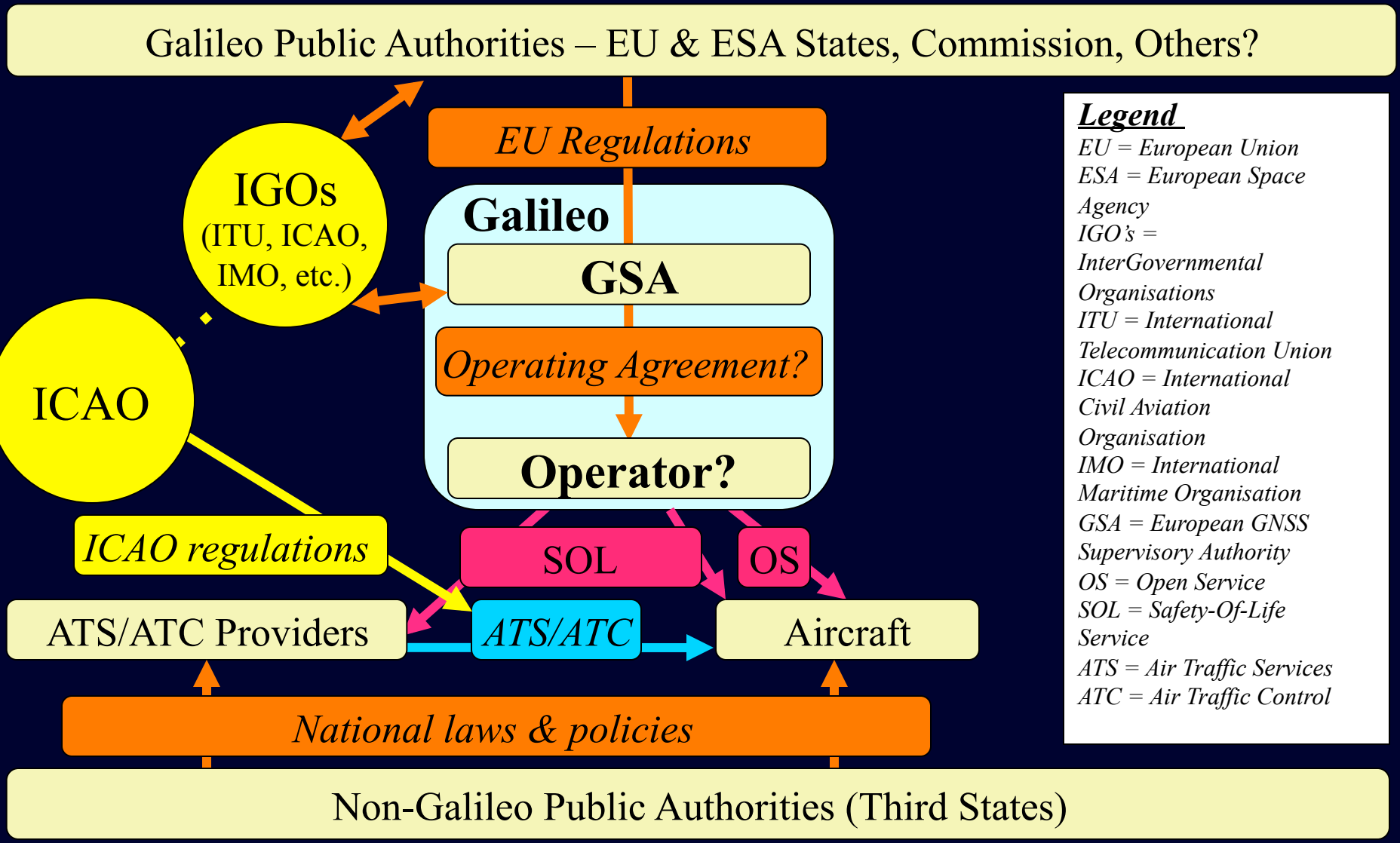


Galileo

- Being developed under EU leadership
  - With ESA as developer & procuring agency
    - Satellite system & ground segments
  - ➔ Requires appropriate governance arrangements

  P.M.: Aim of FOC by 2013
  - Aims for services with fees, guarantees & integrity (CS, PRS & SOL)
    - ➔ Need for specific legal framework
  - Aims for international participation – & markets!
    - ➔ Requires international agreements

Galileo Legal / Functional Model & aviation



Legend

EU = European Union
ESA = European Space Agency
IGO's = InterGovernmental Organisations
ITU = International Telecommunication Union
ICAO = International Civil Aviation Organisation
IMO = International Maritime Organisation
GSA = European GNSS Supervisory Authority
OS = Open Service
SOL = Safety-Of-Life Service
ATS = Air Traffic Services
ATC = Air Traffic Control

Reg. 683/2008 (1)

- Reg. 1321/2004 had created GSA
- ➔ Reg. 683/2008 further outlines EGNOS & Galileo governance
- On EGNOS:
  - Operation financed by EU (Art. 6(1))
  - Delegated by public service contracts (Art. 6(2))
    - Currently (only) ESSP
  - EU ensures compatibility also with conventional means of navigation, where possible (Art. 7(1))
  - EU owns all tangible & intangible assets (Art. 8)

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Reg. 683/2008 (2)

- On Galileo:
  - Deployment financed by EU (Art. 4(2))
    - Procurement principles: open access & fair competition; '2/6' rule & '40%' rule (Art. 17(1) & (2))
  - Exploitation: PPP may be back on the table
    - Report 2010 on potential revenue-sharing mechanisms, service concession contracts & public service contracts (Art. 4(3))
  - Commission overall management (Art. 12(1))
    - GSA role in security accreditation & security centre; promotion commercialisation, applications & services; certification (Art. 16)

Reg. 683/2008 (3)

- Non-EU involvement:
  - Member states, 3rd states & IGOs contributions, subject to agreement (Artt. 4(4), (5); 6(3), (4))
  - ESA: multi-year delegation agreement (Art. 18)
    - Subject to principles Art. 17 on public procurement (§ 1)
    - Lays down general conditions for management funds entrusted to ESA (§ 2)
    - Includes notably rules ownership all tangible & intangible assets (& transfer thereof to EU)
    - Financing ESA ends with end validation phase (Art. 4(1))

Int'l air law (1)

- Several bodies of air law governing aviation, incl. dealing with navigation

➔ Largely given shape by organisations, because of overriding safety concerns

1. National, following sovereignty
2. Global harmonisation structure
   - ICAO, following Chicago Convention

Note: European air law & IGOs

Int'l air law (2)

- 1944 Chicago Convention
- Focus on safety (int'l) aviation
  - Part I: "Air Navigation"
    - Art. 1: national sovereignty over airspace
    - General duties provision air navigation in national airspace (e.g. Artt. 11, 12, 15)
    - Art. 28: amounts to international responsibility for safety of navigation in national airspace
- *Inter alia* establishes ICAO for the purpose – Part II

ICAO

- International Civil Aviation Organisation
  - Competences to harmonise *national* regulations pertaining to safety (Artt. 49, 54-55, 57)
    - Assembly, Council & Air Navigation Commission
  - Development of SARPs (Artt. 37-38)
  - → Various Annexes
    - Annex 2: Rules of the Air
    - Annex 6: Operation of Aircraft
    - Annex 10: Aeronautical Telecommunications
    - Annex 11: Air Traffic Services

Liability (1)

- Liability: case study legal implications
  - Directly quantifiable in monetary terms (…)
- Liability general concept, very frequently used
  - Every state its own interpretation / implementation in domestic law

    (Not to mention every expert …)
  - In addition: liability at an international level
    - Usually phrased in terms of obligations to compensate for ***damage*** caused by one's activities

    ←→ Liability is not 'self-evident' or 'God-given'

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Liability (2)

- Liability is:

  "the accountability of a person or legal entity to compensate damage caused to another person or legal entity, as determined by specific legal rules and principles and based upon specified sources of law"

Elements (1)

1. Type of liability
   - Contractual / inter-party
   - Tort / third-party
   - Special type: product damage
2. Fault *versus* absolute liability
   - Or strict liability
   - Burden of proof
   - Possible exonerations
     - Contributory negligence? Gross negligence? Willful misconduct? 'Act of God' / *force majeure*?

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Elements (2)

3. Accountable entities *versus* claimants
   - States? IGOs? Private parties? Individuals?

   Note: Not necessarily who caused / suffered damage
4. Damage
   - Only direct? Also indirect / loss of revenues?
5. Compensation
   - Limited or unlimited? If limited, what limits?
   - Moral / punitive ‘damages’?

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Liability & GNSS (1)

- Precise elaboration & application of each of these elements depends upon the applicable specific legal regime
  - As further detailed by jurisprudence of courts & tribunals properly seized of a dispute on the matter
  - Where no clearly applicable specific legal regime (or lack of clarity in its application), courts & tribunals, if obliged to adjudicate a dispute, have to interpret, elaborate & apply general principles, analogies etc. *motu proprio*

Liability & GNSS (2)

- No GNSS-dedicated legal regime …

←→ Many partially applicable legal regimes

  - Space law liability – to damage caused by sats
  - Air law liability – to damage caused by aircraft
  - Maritime liability – to damage caused by ships
  - Railroad liability – to damage caused by trains

➔ Nature of damage to be focused on

  - 'Indirect' – e.g. 'downstream accidents' – = key

Aviation liability

- *Not* per Chicago Convention / ICAO

←→ Third-party liability towards victims on the ground

  - 1952 Rome Convention, 1978 Montreal Protocol, 2009 Montreal Convention
  - National law (in most cases)

←→ Contractual liability towards passengers

  - From 1929 Warsaw Convention to 1999 Montreal Convention

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GPS & liability

- Discussions in ICAO

1. Lack of liability acceptance USA
   - No contract, no guarantees, no fees
   - Russia / GLONASS essentially follows lead
2. US acceptance of civil liability
   - Liability under national US law
     - Federal Tort Claims Act, Suits in Admiralty Act
     - Sovereignty-issues foreign user states
     - Practical problems with US court proceedings
   - No ‘international’ liability acceptance

EGNOS & liability

- EGNOS cannot accept liability for primary system (GPS) input
  - GPS offers no guarantees / liability acceptance

←→ Only liability for 'its' own input

  - Where approach was developed to focus on certification …

➔ SES Regulations being developed *inter alia* to deal therewith

←→ Liability still domestic law issue!

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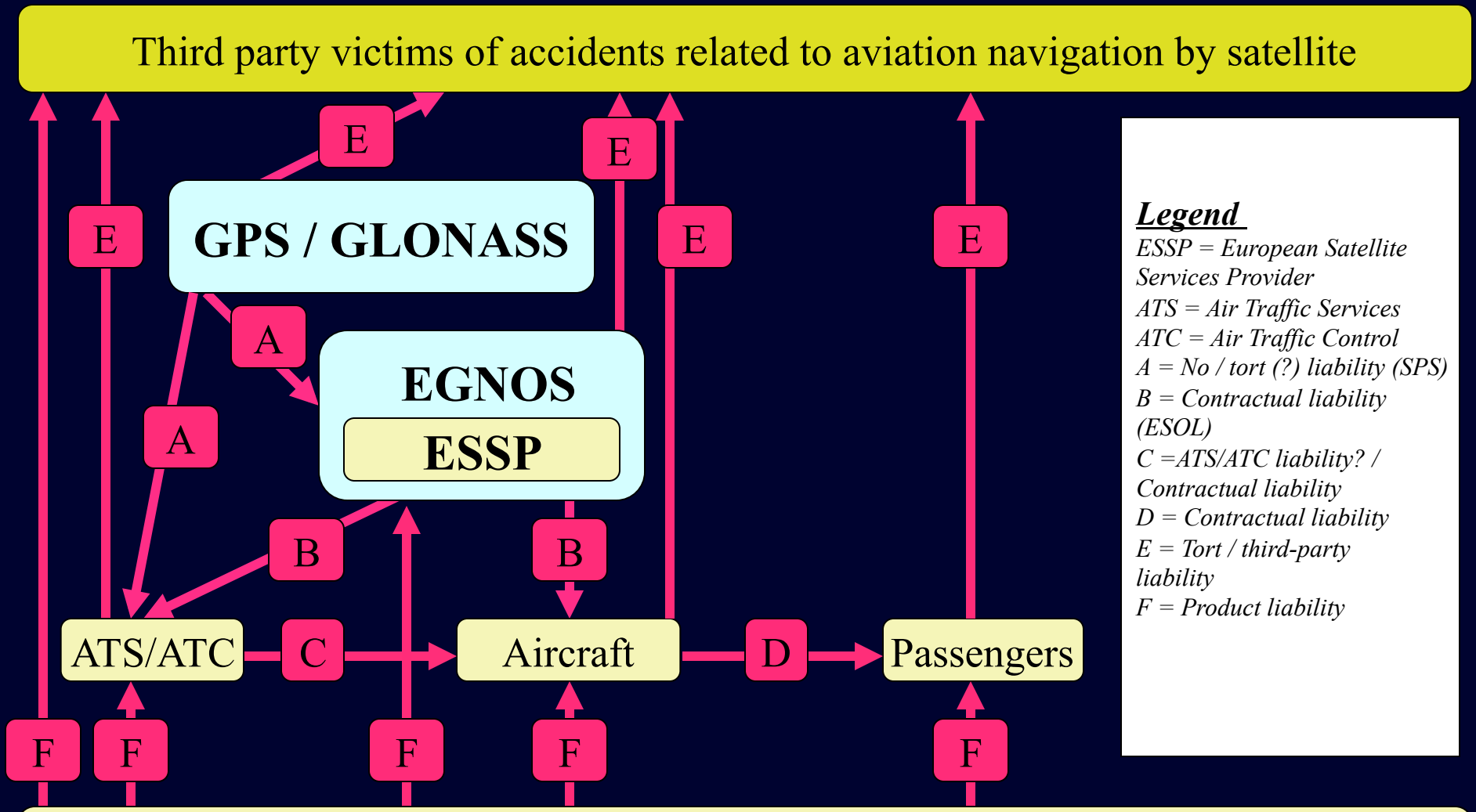
GPS/EGNOS Legal / Functional Model for aviation & liability



Legend

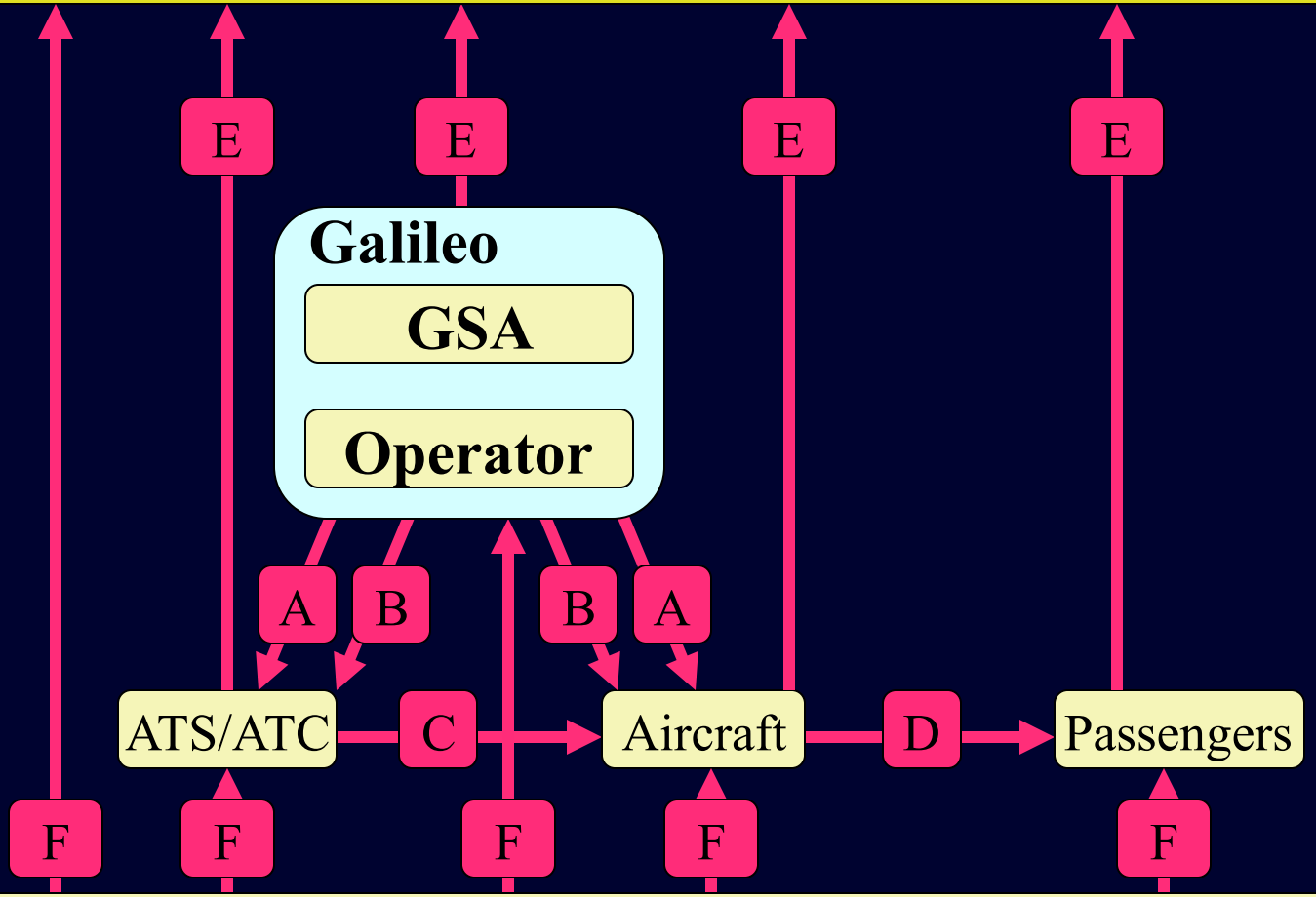
ESSP = European Satellite Services Provider
ATS = Air Traffic Services
ATC = Air Traffic Control
A = No / tort (?) liability (SPS)
B = Contractual liability (ESOL)
C =ATS/ATC liability? / Contractual liability
D = Contractual liability
E = Tort / third-party liability
F = Product liability

Galileo & liability

- Focus on commercial viability
  - Cf. PPP approach, temporarily (?) discarded
- Towards liability acceptance …?
  - No product liability as such
    - ‘Galileo’ structure not itself to produce or sell
  - Non-contractual liability ...?
    - Not for ‘Galileo’ itself to change
    - Within EU possibility for EU law to change?
  - Contractual liability ...?!
    - Notably including *appropriate derogation of liability*
    - ➔ Provide for black box-like monitoring

Galileo Legal / Functional Model for aviation & liability

Third party victims of accidents related to aviation navigation by satellite



Legend:

GSA = European GNSS Supervisory Authority
ATS = Air Traffic Services
ATC = Air Traffic Control
A = No / tort (?) liability (OS)
B = Contractual liability (SOL)
C = ATS/ATC liability? / Contractual liability
D = Contractual liability
E = Tort / third-party liability
F = Product liability

Manufacturers of relevant products – aircraft, avionics, satellite devices, etc.

Maritime liability

- International regime for contractual liability ***international*** transport only
  - 1974 Athens Convention – for passengers
  - 1924 Hague Rules, 1968 Visby Rules & 1978 Hamburg Rules – on cargo
  - Private liability regimes – carriers are liable
  - Compensation subject to various limitations
    - Except if intent to cause damage / reckless behaviour
  - Fault liability regimes / reversed burden of proof
- Third-party liability completely nat'l

Railroad liability

- International regime for ***international*** rail transportation – only contractual
  - 1980 COTIF Convention & 1990 Protocol
    - 1970 CIV Convention – for passengers
    - 1970 CIM Convention – for cargo
  - Private liability regimes – railway is liable
  - Compensation subject to various limitations
    - Except if intent to cause damage / reckless behaviour
  - Strict liability regimes (if no fault of passenger)
- Third-party liability completely nat'l

Road liability

- International regime for ***international*** road transportation – only contractual
  - 1973 CVR Convention – for 'mass' passengers
  - 1956 CMR Convention & 1978 Protocol – on cargo
  - Private liability regimes – carriers are liable
  - Compensation subject to various limitations
    - Except if wilful misconduct / gross negligence
  - Strict liability regimes (if no fault of passenger)
- Third-party liability completely nat'l

Beyond int'l liability

- Contractual liability: free to contract
- Third-party liability
  - Theory third-party liability
  - Third-party liability in France
  - Third-party liability in the United Kingdom
- Product liability
  - Theory product liability
  - Product liability in France
  - Product liability in the United Kingdom

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Third-party liability

= Non-contractual liability

- "Liability for damage occurring *outside* a contractual relationship, most prominently where the person or entity suffering the damage is in no way formally or contractually related to the person or entity causing it (or at least any damage caused would not be covered by any such formal or contractual relationship), and likely neither aware of the possibility of damage occurring nor able to take precautionary measures against it"

≈ Tort liability

France (1)

- French Civil Code, Artt. 1382, 1383
  - General fault-based non-contractual liability regime
    - Any wrongdoing by a person causing damage to third party must be compensated, whether such fault is intentional, or results from negligence or carelessness
    - Three key constitutive elements
      1. Fault – "illicit behaviour which contravenes an obligation or duty imposed by law or customary rules" ('good parent' standard)
      2. Damage – property & bodily, incl. moral
      3. Causal connection – "effective cause which generated damage"

France (2)

- Case law experience potentially applicable to GNSS services
  - Vicinity of satellite signal receiving station as ‘neighbourhood disturbance’ nuisance
    - French law applies ‘precautionary principle’: uncertainty of risk = damage in itself!
    - Regardless of administrative authorisation, & compliance therewith!
  - Fault can be characterised by failure contracting party to meet contractual duty to safely achieve given result when such failure causes damage to third parties

France (3)

- Case of subcontracting
  - Act N° 75-1334 (1975) applies to subcontractors in France – even if contract ruled by law state of prime contractor
  - Entitlement to claims based on tort law resp. contractual law depends on transfer of ownership over assets: if no transfer, only claim in tort possible, if transfer, only claim under contract possible

France (4)

- Non-accumulation of liabilities
- Exclusion / limitations liability contract
  - Not possible *vis-à-vis* to 3rd parties
    - 2005 Catala report on reform of contract law proposes such possibility, but report not implemented yet
  - Third party can also not be beneficiary of a contract (normally speaking) (Art. 1165)
  - Not enforceable anyhow if wilful misconduct / gross negligence / bodily injury ➔ tort liability!

France (5)

- Liability = joint & several
  - ➢ Victim can assert claim against any defendant for any & all damages incurred, regardless of relative fault particular defendant
  - ➔ Failure in SOL service as one of multiple triggering events for airplane crash: operator could be considered liable by French court jointly & severally with other defendants
  - & Claimant could recover all damages from SOL service provider regardless of non-exclusivity of fault SOL service provider!

France (6)

- Vicarious liability
  - Art. 1384-5: principal may be held strictly liable for damages caused to third parties by fault of its agent acting on his behalf & over whom principal retains surveillance, direction & control
    - I.e., does not apply to service contracts but essentially to employees & fully-controlled daughter entities
    - Does only apply to the extent agent's wrongdoing is related to his/her functions under the construction
    - No wrongdoing on the part of the principal, other than the agent's wrongdoing, need to be at issue

France (7)

- Liability custodian
  - Art. 1384-6: custodian of an item (= person / entity with power to use, manage & control it) is liable to third parties for damage caused by it, even if no wrongdoing custodian at issue
  - Issue for GNSS provision through Galileo: control Commission / GSA? Control GNSS service provider downstream service providers?
  - French jurisprudence admits wide variety of items, tangible & intangible
    - Emission steam, smoke, sound waves; electric power; sound signs

France (8)

- Administrative law liability
  - Jurisdiction French administrative courts
    - Does not necessarily exclude civil liability principles, as long as applied by administrative courts
  - Normally fault-based (third-party) liability
    - Same three key elements: (1) fault; (2) damage; (3) causal connection
    - ***Also*** (4) proof of gross negligence required if damage caused by difficult activity / related to sovereign powers
    - *Rarely* may claimant benefit from presumption of fault
      - Main example: hospital-acquired infection

France (9)

- French administrative law (liability) applies to public entities
  - State itself, local authorities, public agencies
    - Except when acting as mere economic operators (≠ public works)
  - ←→ Not to companies / EPICs
    - ***Companies***: unless entrusted with public service mission / undertaking public works *(more in a second)*
    - ***EPICs***: unless holding prerogatives of public authority
  - → Character GNSS service provider & role in provision SOL/PRS (& SAR?) *versus* OS/CS!

France (10)

- Public service mission if:
  1. Qualified as such by statutory provisions
  2. Three cumulative conditions are met
     1. Activity is of public interest
     2. Activity is operated under control public authorities
     3. Operator holds prerogatives of public authority
  3. Intention public authorities of entrusting entity with public service mission may be assumed
- Can be by service concession, public service contract, or combination

France (11)

- Involvement third states & IGOs?
  - Not ***French*** authorities ➔ French administrative law does not apply
  - If public tasks / works delegated to French authorities, administrative law ***does*** apply
    - Example: France undertaking work on behalf of OECD
  - ➔ Submission public services performed on behalf of EU (other than by EU itself) to French administrative law cannot be ruled out …

France (12)

- Finally: criminal liability …?
  - Malfunctions in GNSS service chain may trigger criminal liability
  - French Criminal Code covers some non-intentional offences
    - Physical integrity (Art. 222-19)
    - Death (Art. 221-6)
    - Endangering life person (Art. 223-1)
      - If at least deliberate violation safety obligation
  - Criminal liability may apply to legal persons
  - *Lex loci delicti* applied

United Kingdom (1)

- Tortuous liability ≈ fault-based
  - ➢ Claimant must prove sufficient 'proximity' to defendant to require duty of care owed by the latter to the former **&** negligent / fraudulent / deliberate behaviour in breaching this duty
  - ➔ Not very likely for GNSS operator to incur liability – for GNSS service provider this may be different
    - ◆ E.g., radio signals from satellite might give rise to private right of action in tort if operator could be proven to have been aware that signals could cause damage

United Kingdom (2)

- Limitation tortuous liability
  - Allowed in most circumstances by appropriate notices
    - Sales GPS devices accompanied by notice of potential downgraded / unavailable signals
  - Restrictions however usually not applied when death / personal injury are concerned
- Exceptionally: strict liability
  - Almost always statutory
  - Primarily public health & safety issues
    - E.g. escape noxious substances

United Kingdom (3)

- Radioactive Substances Act (1993)
  - Applicable to sats with radioactive generator
- Other environmental legislation might have an impact, too
- Criminal liability
  - Death / injury to persons / damage to property
    - Usually proof of specific intent required
    - Level dependent upon severity prosecuted act
  - *Lex loci delicti* applied if defendant present in UK / will be extradited to UK

United Kingdom (4)

- Corporate entities
  - Corporate entities & their directors may also incur criminal liability
  - Duty of care in carrying out commercial activities, construction, maintenance of operations, use / keeping plant, vehicle or other thing
  - Strict liability usually applied in areas of environmental law & consumer protection

United Kingdom (5)

Note: Considerably less details as per statutes – UK = common law country ➔ much larger role (interpretation) jurisprudence

➔ Detailed analysis of likely approach UK courts to GNSS(-liability)-related disputes would require analysis of much more jurisprudence – or of possible tendency to draft statute?

Product liability (1)

- Different from contractual & third-party / non-contractual liability
  - Can, as the case may be, be understood either as a kind of contractual or as one of non-contractual liability
  - "Legal liability of manufacturers / sellers to compensate buyers, users & even bystanders for damages / injuries suffered because of defects in goods purchased / used ***independently*** of any activity involving the good & the liability for such activity"

Product liability (2)

- Starting point: EU Dir. 85/374
  - Amended by EU Dir. 1999/34 – esp. to include "electricity" in definition "product"
  - Within limits Dir. discretion to implement at national level
    - E.g. Germany: "product" = "any movable even though incorporated in another movable / immovable, as well as electricity"
      - Satellites & related equipment certainly covered; satellite *signals* not certain
      - Operator not very likely to be held directly liable in view of broad definition "producer" – but liability may 'flow up'

France (1)

- French Civil Code, Artt. 1386-1 to -18
- Producer liable for damages caused by safety defect whether contractual relation to claimant or not
  - Refers to safety user is entitled to expect under normal usage conditions (Art. 1386-4)

  ←→ Excessive, abnormal, not-to-be-expected danger emanating from product & its use triggers liability regime

France (2)

- Strict liability regime
  - Provisions excluding / limiting liability prohibited / null & void
    - Unless product exchanged between professionals & used for professional purposes
  - Producer cannot rely on absence of fault
  - Liability applies even if product state-of-the-art / existing norms / authorised by regulatory authority

France (3)

- Applicability to GNSS services?
  - "Product" = "Any movable, even though incorporated into an immovable. Electricity shall be deemed a product." (Art. 1386-3)
    - No *dictum* courts yet on satellites as movables or not

1. First scenario: liability as service provider?
   - Originally liability was extended to any supplier, but ECJ ruling: = breach Dir.
   - ➔ Narrower interpretation – only where producer cannot be identified (Art. 1386-7)
   - ➔ Now operator unlikely to be held liable for defects satellites / related equipment

France (4)

- Applicability to GNSS services? – *ctd.*
  2. Second scenario: liability for satellite signals?
     1. Analogy with legal framework radio frequencies
        - Characterised as immovable, part of state's 'real' estate
        - If applied here, product liability law would ***not*** apply
     2. Satellite signals = electromagnetic waves

     ➔ Incorporation in 'electricity'?

     ←➔ *Expressio unius est exclusio alterius*

     ◆ Specific difficulties with applying product liability to satellite signals would remain
        - What is 'defective' signal? To what extent can / should natural phenomena be seen as part of 'normal usage'?

United Kingdom

- Consumer Protection Act (1987)
  - No-fault based liability for personal injury / property damage > £ 275 for defective products by consumer
  - Liability for producer – or importer if product manufactured overseas
    - Applies to consumer products & products used in workplace
    - ➔ Unlikely to apply to satellite
    - ➔ Likely to apply to consumer devices using GNSS signals
  - No *dictum* on satellite signal as product or not

Conclusions (1)

- GNSS operators under current law likely to remain outside direct liability claims under tort / third-party or product liability
  - Although exceptions may apply …
- Liability may however be 'flowed up' by original defendants using GNSS
  - Esp. if GNSS services nor provided for free
  - Waivers may / may not be upheld

Conclusions (2)

- Differences between national laws individual states may lead to major differences in conditions under which liability entities involved in GNSS service provision chain would / might arise
- Depends partly upon which scenario is developed for exploitation GNSS
  - Public *versus* private operator

Conclusions (3)

- Generally speaking GNSS service provider may encounter third-party liability claims in various jurisdictions, usually on a fault-basis
- Sometimes GNSS service provider may be able to disclaim certain liabilities
  - Cf. also example of telecommunications
  - But if product liability applies, usually strict

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