

**MISSING AN IMPORTANT OPPORTUNITY
TO IMPROVE
THE SAFETY FOR HUMANS IN SPACE
AND PROTECT
THE SPACE ENVIRONMENT**

Viviana Iavicoli

Institute for International Legal Studies – ISGI (CNR)

Definition of Safety

- **Space Law:** no definition
- **Scientific notion:** 3 main categories of risks
 - human life
 - environment
 - damage or loss of flight or ground hardware

Space Law

- “a specific and coherent set of activities of States and other subjects, including private subjects, in outer space or related to outer space activities”
- Branch of international law
- *Lex specialis* as *ratione materiae* criterion

Space Law and Technologies

- Interdependence
- No cause-effect connection: sometimes law has followed the development of technologies; on other occasions it leads

Technologies and Risk

Modern technologies
might carry risk

“technological risk”

Ultra-hazardous activities

- zero risk impossible to achieve
- risk is intrinsic to the conduct of all space activities
- international law considers space and nuclear activities as “ultra-hazardous” but lawful (not prohibited by international law)
- safety is key element in the use of technologies
- use of technologies which might potentially produce harm only alongside preventive measures.

Work of the International Law Commission (ILC)

- Draft principles concerning the prevention of damage adopted in 2001
- Draft Principles on the allocation of loss adopted in 2006

Draft text on the Prevention of Transboundary Hazardous Activities,

Draft text on the Prevention of Transboundary Hazardous Activities

- ultrahazardous activity: “an activity with a danger that is rarely expected to materialise but might assume, on rare occasion, grave (more than significant, serious or substantial) proportion”

Draft text on the Prevention of Transboundary Hazardous Activities

- relationship between “risk” and “harm: risk(s) of causing significant transboundary harm
- tranboundary harm: a harm caused in the territory under the jurisdiction of another State

international law

- duty to prevent transboundary harm in case of ultra-hazardous activity
- duty of precaution: questionable - cases where scientific uncertainty could exclude environmental protection

Space Law

- Liability regime: special regime of responsibility
- duty to compensate damage in case of its occurrence.
- Outer Space Treaty (art. VII)
- Liability Convention

Liability regime

- Liability Convention: definition of damage
“loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations” (art. 1).

Space Law

- space law is principally based on treaties binding only for States party to them
- also customary principles create obligations but for all the subjects of the international community (States and international organizations).

Provisions on safety

- OST- art. V: “prompt and safe” restitution of astronauts to the State of registry in case of accident or unintended landing in another State Party to the OST
- OST - art. XII: safety of representatives of a State Party to the Treaty who, in case of a visit to stations or installations and equipment on the Moon or other celestial bodies belonging to another State Party of the Treaty, has to be received with “maximum precautions” to assure their safety

Provisions on safety

1968 Agreement on Rescue of Astronauts, the Return of Astronauts and the Return of Objects

- Art. 4: return of astronauts even if the accident or unintended landing occur in the high seas or on territory not subject to the jurisdiction of any state

Non binding text on safety in space

- 1992 Principles regarding the Use of Nuclear Power Sources in Outer Space
- 2007 Space Debris Mitigation Guidelines

1992 Principles on NPS

- Principles on NPS adopted by the General Assembly on 14 December 1992 with Res. 47/68
- Not legally binding
- No definition of safety
- Applicability of international law
- Technical aspects
- Procedural duties (notification, consultation, settlement of disputes)

1992 Principles on NPS

- guidelines and criteria for the safe use of NPS
- space reactors and radioisotope generators
- notification of re-entry, consultations, responsibility and liability

1992 Principles on NPS

- Principle 3(a):
“States launching space objects with nuclear power sources on board shall endeavour to protect individuals, populations and the biosphere against technological hazards”

1992 Principles on NPS

- Principle 3(a): Design and use shall also ensure with high reliability that radioactive material does not cause a significant contamination of outer space”.

- Draft Safety Framework for Nuclear Power Source (NPS) Applications in Outer Space (A/AC.105/C.1/L.292/rev.1)
- Under negotiation by Joint Expert Group of Scientific Technical Subcommittee of COPUOS and IAEA

Draft Safety Framework for NPS in OS

- is intended to provide high-level guidance to States and intergovernmental organisations to mitigate risks arising from the use of space NPS
- voluntarily guidance not binding
- The development of the framework takes into consideration applicable conventions, principles, and international law

Draft Safety Framework for NPS in OS

- limits its applicability to protect only “people and the environment in Earth’s biosphere”
- No mention of the protection of outer space and the environment of other planets.

1992 Principles

- Principles invited States to ensure “with high reliability that radioactive material does not cause a significant contamination of outer space”.
- Principles provides for the protection of “individuals”, without distinction of their location; if they are on the Earth or in space.

International law

- Duty to take preventive measures to limit/avoid the occurrence of a transboundary damage
- Applicability to space of international law
- Applicability of international law to the harm produced in a territory which is not under the jurisdiction of a State (space and celestial bodies).

Art. IX OST

- “States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose”.

Art. IX OST

- obligation to avoid harmful contamination of the outer space and other celestial bodies :
- **forward contamination**: introduction into outer space or celestial bodies of terrestrial materials
- **back contamination**: introduction onto the Earth or into the atmosphere contamination of extraterrestrial agents

Art. 7 1979 Moon Agreement

- “In exploring and using the Moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment, whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise”

Practice of States

- reflects the *opinion juris* of the international community (convictions expressed or shown by States)
- allows the establishment of customary rules.
- protests made by States when they deem certain conducts detrimental to space activities

Non-binding rules

- 1992 Principles for the Use of NPS in Outer Space
- 2007 Space Debris Mitigation Guidelines

Planetary Protection Policy

- COSPAR
- Not legally relevant
- Are intended to protect a safe environment in space and on other celestial bodies, keeping their integrity
- Applied by space agencies

HUMANS IN SPACE

- Few references to safety in the UN general Treaties on space
- OST
- Rescue (or Astronauts) Agreement
- Moon Treaty

UN Treaties on space

- No definition of astronaut
- different expression to identify men in space: “personnel”, “crew”, “representative”, “persons on board”
- Art. V of the OST: “envoys of mankind in outer space”.

Definition of an astroanaut

- any person on board a space object or making extra-vehicular activities and any person on the Moon and other celestial bodies
- no distinction between an astronaut as an “envoy of humankind” and a space tourist

Lex Ferenda

- Improvement of the Astronaut Agreement
- Elaboration of a Code on Astronauts
 - physical persons
 - professional activity
 - envoys of humankind

Code on astronaut

- legal status, rights and obligations
- ethical considerations
- responsibility for safety measures on board
- astronaut as subjects of research and experiments
- protection from radiations

ISS Code of Conduct

- Art. 11 of Intergovernmental Agreement (IGA)
- disciplinary regulations
- physical and information security guidelines
- ISS commander's authority and responsibility for the enforcement of safety procedures