



**SEARCH AND RESCUE IN SPACE
ACTIVITIES:
IS THERE A SPECIFIC LEGAL REGIME?**

Dr. George D. Kyriakopoulos

**6th IAASS Conference
Safety is Not an
Option**



**International Association for the Advancement of Space
Safety**

McGill University - Institute of Air and Space Law



Sixth IAASS Conference, 21-23 May 2013

**Institute of Air and Space Law
Faculty of Law, McGill University
3644 Peel Street
Montreal, Quebec H3A 1W9**

6th IAASS Conference: Safety is Not an Option

**SEARCH AND RESCUE IN SPACE ACTIVITIES: IS THERE A
SPECIFIC LEGAL REGIME?**

Dr. George D. Kyriakopoulos

*Lecturer in International Law,
National and Kapodistrian University of Athens,
14, Sina Street, 10672 Athens, Greece
Email: yokygr@law.uoa.gr*

6th IAASS Conference: Safety is Not an Option

Activities in *les espaces* (high seas, airspace, outer space) always involved a certain degree of risk:

-Risk to property

-Risk to life

In all of the three main *espaces* accidents and incidents occurred frequently

6th IAASS Conference: Safety is Not an Option

Which is the difference between an accident and an incident ?

6th IAASS Conference: Safety is Not an Option

Incident, Accident: Black's Law Dictionary

Accident → “an unforeseeable and unexpected turn of events that causes loss in value, injury, and increased liabilities”.

Incident → “a happening or an event”.

6th IAASS Conference: Safety is Not an Option

Incident, Accident: Annex 13 to the 1944 Chicago Convention on International Civil Aviation

Accident → “an occurrence associated with the operation of an aircraft... in which:

a) a person is fatally or seriously injured...

b) the aircraft sustains damage or structural failure which... adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component...

c) the aircraft is missing or is completely inaccessible

6th IAASS Conference: Safety is Not an Option

Incident, Accident: Annex 13 to the 1944 Chicago Convention on International Civil Aviation

Incident → “an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation”.

Serious incident → “an incident involving circumstances indicating that there was a high probability of an accident and associated with the operation of an aircraft...”.

“[So] The difference between an accident and a serious incident lies only *in the result*”.

6th IAASS Conference: Safety is Not an Option

→ accidents and incidents mainly differ in the loss of human lives and the degree of damage provoked to the corresponding vehicle

6th IAASS Conference: Safety is Not an Option

Search and Rescue (SAR) operations → intended to save human lives during accidents

The international obligation to render assistance to persons on board ships or aircraft in distress → respect of “elementary considerations of humanity”

6th IAASS Conference: Safety is Not an Option

1979 Hamburg Convention on maritime search and rescue and the Annex 12 to the 1944 Chicago Convention on International Civil Aviation:

“Search” → “an operation, normally coordinated by a rescue co-ordination centre... using available personnel and facilities *to locate persons in distress*”

“Rescue” → “an operation to *retrieve persons in distress*, provide for their initial medical or other needs, and deliver them to a place of safety”.

→ SAR → a complex operation in two parts, which requires specific organization and administration.

6th IAASS Conference: Safety is Not an Option

SAR in Outer space activities:

By their very nature, space activities are extremely hazardous

Significant accidents and incidents have already occurred

6th IAASS Conference: Safety is Not an Option

Some examples:

- *The Apollo 1 accident*: American astronauts Gus Grissom, Edward White and Roger Chaffee have died on January 27th, 1967, because of a fire in their capsule, during tests. First United States fatal space accident.
- *The Soyuz 1 accident*: On April 24th, 1967, Soviet astronaut Vladimir Komarov was killed after the crash of his spaceship, Soyuz 1, due to a parachute problem after re-entering the Earth's atmosphere.
- *The Apollo 13 accident*: Mission aborted after two days, because of the explosion of an oxygen tank. NASA has classified this case as a "successful failure", as the three members of the crew successfully returned to Earth.
- *The Cosmos 954 incident*: The Soviet satellite Cosmos 954 re-entered the Earth's atmosphere in January 1978, after unexpected depressurization. Satellite debris were scattered over a large area of the Northwest Territories of Canada.

6th IAASS Conference: Safety is Not an Option

Some examples #2:

- *The Skylab incident*: *Skylab* space station re-entered the atmosphere in July 1979, spreading debris all over the Great Dessert in Australia.
- *The Challenger accident*: In January 1986, The United States space shuttle “Challenger” exploded seventy-three seconds after launch, causing the loss of the seven astronauts on board. An intensive search operation has taken place.
- *The Columbia accident*: On Feb. 1, 2003, Columbia disintegrated when re-entering the atmosphere, due to damage to its left wing. All seven members of the crew perished. Shuttle debris fell in Texas and Louisiana.

6th IAASS Conference: Safety is Not an Option

Outer Space distress situations:

- **Space objects/vehicles crash-landed on Earth (land, sea, under the jurisdiction of a given State or not), during the launch phase or after re-entry in Earth's atmosphere**
- **Space objects/vehicles in (any) orbit, being on celestial bodies or in any kind of space travel (extravehicular activities included)**

6th IAASS Conference: Safety is Not an Option

QUESTIONS:

Which is the legal framework of rendering assistance to persons in distress in outer space?

Is there a “space” SAR regime?

6th IAASS Conference: Safety is Not an Option

SAR AT SEA

1) The master of a ship (UNCLOS art. 98 par. 1):

→ “render assistance to any person found at sea in danger of being lost”

→ “proceed with all possible speed to the rescue of persons in distress, if informed of their need of assistance”

→ (After a collision at sea) “render assistance to the other ship, its crew and its passengers...”

6th IAASS Conference: Safety is Not an Option

SAR AT SEA

2) Coastal States (UNCLOS art. 98 par. 2):

→ “promote the establishment, operation and maintenance of an adequate and effective search and rescue service”

→ Cooperation with neighboring States “by way of mutual regional arrangements”

6th IAASS Conference: Safety is Not an Option

SAR AT SEA

The 1979 Hamburg Convention on Maritime Search and Rescue:

→ “SAR SERVICES”: “distress monitoring, communication, co-ordination and search and rescue functions, including provision of medical advice, initial medical assistance, or medical evacuation, through the use of public and private resources including co-operating aircraft, vessels and other craft and installations”

→ “SAR REGIONS”: areas “of defined dimensions associated with a rescue co-ordination centre”, established by agreement among the States concerned, notified to the Secretary-General of the International Maritime Organization (IMO).

6th IAASS Conference: Safety is Not an Option

SAR AT SEA

The 1979 Hamburg Convention on Maritime Search and Rescue:

→ obligation of co-ordination between maritime and aeronautical SAR regimes and operations :

- creation of joint rescue co-ordination centres
- coordination between separate centres
- use of common procedures

6th IAASS Conference: Safety is Not an Option

SAR IN AIRSPACE

The 1944 Chicago Convention on International Civil Aviation, art. 25 :

→Obligation of States:

- ❑ to provide... assistance to aircraft in distress in [their] territory
- ❑ and to permit... the owners of the aircraft or authorities of the State in which the aircraft is registered to provide such measures of assistance “as may be necessitated by the circumstances”
- ❑ “When undertaking search for missing aircraft, [States] will collaborate in coordinated measures which may be recommended from time to time pursuant to this Convention”.

6th IAASS Conference: Safety is Not an Option

SAR IN AIRSPACE

Which are these “coordinated measures”?

6th IAASS Conference: Safety is Not an Option

SAR IN AIRSPACE

Annex 12 to the Chicago Convention, “Search and Rescue” :

- Establishment of Search and Rescue Regions (SRRs)
- Extend over the High Seas
- By Regional Air Navigation (RAN) Agreements
- Service administration/organization by a “responsible Authority”
- Coordination of SAR operations → Clear obligation
- Coordination of SAR operations & common SAR plans →

6th IAASS Conference: Safety is Not an Option

SAR AT SEA & IN AIRSPACE

A “global SAR system” is promoted through :

-the Joint IMO-ICAO SAR Manual → common guidelines for
airspace and maritime SAR operations

-Harmonization Annex 12 / Hamburg Convention

6th IAASS Conference: Safety is Not an Option

SAR AT SEA & IN AIRSPACE

On the High Seas, in International Airspace :

→ More than a regime, a SAR system of permanent nature

- a) receives, acknowledges and relays notifications of distress
- b) co-ordinates SAR responses
- c) conducts SAR operations

6th IAASS Conference: Safety is Not an Option

SAR AT SEA & IN AIRSPACE

Advantages of the Sea-Air SAR System :

- No need for States to provide SAR services for their own citizens
- Permanent SAR services assist anyone in distress within the SRR without regard to nationality or circumstances

6th IAASS Conference: Safety is Not an Option

**Is there an analogous SAR system
for Outer Space activities?**

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

The “Early Days” : UNGA Resolution 1962 (XVIII)

→ Principle No 6

“States shall be guided by the principle of cooperation and mutual assistance...” in their activities in outer space

→ Principle No 9

“States shall regard astronauts as envoys of mankind in outer space, and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of a foreign State or on the high seas. Astronauts who make such a landing shall be safely and promptly returned to the State of registry of their space vehicle”.

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

The Outer Space Treaty: Art. V

States Parties to the Treaty shall regard astronauts as envoys of mankind in outer space and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of another State Party or on the high seas. When astronauts make such a landing, they shall be safely and promptly returned to the State of registry of their space vehicle.

In carrying on activities in outer space and on celestial bodies, the astronauts of one State Party shall render all possible assistance to the astronauts of other States Parties.

States Parties to the Treaty shall immediately inform the other States Parties to the Treaty or the Secretary-General of the United Nations of any phenomena they discover in outer space, including the Moon and other celestial bodies, which could constitute a danger to the life or health of astronauts.

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

The Outer Space Treaty: Art. V

- “Rescue obligation” against astronauts (“envoys of mankind”)
- Broad wording, application possible even in case of an earth-to-space, or space-to-space, rescue operation, although the term “all possible assistance” could set a limit.
- “(Safe and prompt) return obligation” provided in case of landing, “to the State of registry of the space vehicle”
- Art. V par. 2: “astronaut-to-astronaut” assistance obligation
- Art. V par 3: “obligation to inform” (other States Parties or the UN Secretary-General about “any (dangerous) phenomena”

SAR IN SPACE

The Rescue Agreement

- Elaborate and concretize OST
- “Prompted by sentiments of humanity”
- “Promote international cooperation in the peaceful exploration and use of outer space”
- Arts. 1-4: assist the “personnel of a spacecraft”
- Art. 5: Return of space objects

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

The Rescue Agreement

- Article 1 – In distress situations, the launching authority and the Secretary-General of the United Nations must be notified
- Article 2 - In case of landing under the jurisdiction of a State, for any reason whatsoever, search and rescue operations are provided by that State, with the possible cooperation of the launching authority
- Article 3 – In case of alighting on the high seas or in any place not under the jurisdiction of any State, every State shall contribute to the SAR operations

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

The Rescue Agreement

→ Article 4 – Under any circumstances (of the accident/incident) and after the (successful) completion of the rescue operations, the personnel of the spacecraft must be returned to the launching authority

→ Article 5 – Except for the personnel, space objects or its component parts shall be recovered and returned to the launching authority

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

The Rescue Agreement

- What should be done if rescue and return of astronauts is inseparable from the recovery and return of the space object?
- In such situations, the humanitarian reasons should prevail and the accomplishment of the action should be governed by provisions concerning assistance and rescue of astronauts

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

The Moon Agreement

- Art. 10: Widens the scope of the assistance obligation to “any person on Moon”
- Art. 5: inform about any “dangerous phenomena” (art. V par. 3 OST)
- Art. 10 par. 2: “Offer shelter in stations, installations, vehicles and facilities to persons in distress on the Moon”
- Art. 13: Obligation to notify
- Art. 12 par. 3: In the event of emergency “involving a threat to human life”, States may use equipment, vehicles, installations, facilities or supplies of other States Parties

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

**A PIECEMEAL REGIME OR AN INTEGRATED
SYSTEM?**

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

A PIECEMEAL REGIME OR AN INTEGRATED SYSTEM?

→ **An *acquis*: Everybody must be rescued**

The obligation to render assistance in outer space is now been considered as applying to any person entangled in space activities: Render support to people in distress in outer space, can already be designated as a principle of international customary law, dictated by “elementary considerations of humanity”. This approach avoids interpretative adventures regarding the term “astronaut”.

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

A PIECEMEAL REGIME OR AN INTEGRATED SYSTEM?

→ A broad interpretation of art. V par. 1 is necessary

It could serve as a legal basis for State assistance in distress situations in “deep” space or during extravehicular activities. As this could be the case for space tourism operations, the creation of a concrete, explicit obligation (through maybe a Protocol supplementary to the Rescue Agreement) could be useful.

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

A PIECEMEAL REGIME OR AN INTEGRATED SYSTEM?

→ In cases of emergency landing on the High Seas, maritime/airspace SAR services can be of use

SAR operations could be coordinated with the competent authorities of the corresponding airspace or maritime SRRs, in order to use their sophisticated infrastructure, organization and equipment.

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

A PIECEMEAL REGIME OR AN INTEGRATED SYSTEM?

→ Space Law provides for SAR operations on the level of principle:
A regime (set of rules), but not a system

No integrated, coherent and self-sufficient SAR system (as in airspace or at sea) seems to exist: Multi-dimensional by nature (as it may take place on Earth, on celestial bodies or in Outer Space) and being mainly an obligation of the (acting) Contracting Party, SAR in space lacks so far a systematic legal approach describing specific procedures, institutionalized mechanisms and technical/legal organization.

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

OPTIMAL SOLUTIONS?

6th IAASS Conference: Safety is Not an Option

SAR IN SPACE

OPTIMAL SOLUTIONS?

- Establishment of specific SAR sectors in space (analogous to SAR regions in airspace)
- Creation of an integrated SAR system for space activities, in coordination and harmonization with the airspace and maritime SAR services
- In the context of the necessary evolution “from principle to system”, the existing Air/Sea SAR legal regimes could serve as models for a comprehensive space regulation, offering a valuable help

6th IAASS Conference: Safety is Not an Option

THANK YOU!