

MANFRED LACHS SPACE LAW MOOT COURT COMPETITION

2015

Team No. 3

IN THE INTERNATIONAL COURT OF JUSTICE

AT THE

PEACE PALACE, THE HAGUE



CASE CONCERNING PLANETARY DEFENSE

THE SOVEREIGN PEOPLES INDEPENDENT DEMOCRATIC REPUBLIC (SPIDR)

v.

THE UNITED REPUBLIC OF ADVENTURA (URA)

ON SUBMISSION TO THE
INTERNATIONAL COURT OF JUSTICE

MEMORIAL FOR THE APPLICANT

THE SOVEREIGN PEOPLES INDEPENDENT DEMOCRATIC REPUBLIC (SPIDR)

TABLE OF CONTENTS

LIST OF ABBREVIATIONS.....	v
TABLE OF AUTHORITIES	vi
A. IMPORTANT LEGAL DOCUMENTS	vi
B. TREATIES AND INTERNATIONAL AGREEMENTS	vi
C. INTERNATIONAL LAW CASES	vii
i. International Court of Justice (I.C.J.).....	vii
ii. Permanent Court of International Justice (P.C.I.J.)	viii
iii. Arbitral Tribunals.....	viii
iv. National Court Decisions	ix
v. Other Judicial Decisions	ix
D. UNITED NATIONS MATERIALS	x
E. LITERATURE	xi
i. Books	xi
ii. Collections	xiv
iii. Articles.....	xvii
iv. Dictionaries	xxi
F. MISCELLANEOUS	xxi
QUESTIONS PRESENTED	xxii
STATEMENT OF AGREED FACTS	xxiii
SUMMARY OF ARGUMENTS.....	xxxiii
ARGUMENT	1
I. URA IS LIABLE FOR DAMAGES UNDER INTERNATIONAL LAW TO SPIDR FOR CHANGING THE ORBIT OF SYD-1, WHICH RESULTED IN THE LOSS OF AND DAMAGE TO DROPGUM	1
A. URA is liable under Article II LIAB for the loss of life and damage to Dropgum	1
1. The destruction of Dropgum constitutes damage under Article I LIAB	1
2. The damages sustained by Dropgum are covered under Article II LIAB	2
a) The damage caused to Dropgum is indirect.....	2
b) The LIAB covers both direct and indirect damages	3

c)	The causal connection between TYRUS’ gravity tractor and the damage to Dropgum is adequate and proximate	5
3.	No fault is required for liability to arise.....	6
4.	URA is under an obligation to provide SPIDR with full compensation under Article XII LIAB.....	7
B.	URA is responsible for the destruction of Dropgum, as it violated rules of international law under the <i>corpus juris spatialis</i>.....	8
1.	The general rules of international law are applicable in outer space	8
2.	URA breached its duty to cooperate and did not achieve an international response to the threat posed by Syd-1.....	10
3.	URA did not act with “due regard to the corresponding interests of all States Parties to the OST”	13
4.	URA failed to avoid adverse changes to the environment of the Earth resulting from the introduction of extraterrestrial matter and failed to undertake appropriate measures under Article IX OST.....	14
C.	URA is responsible for the destruction of Dropgum under general international law	16
D.	URA cannot claim that the wrongfulness of its action is precluded.....	19
II.	URA IS LIABLE UNDER INTERNATIONAL LAW FOR THE LOSS OF OR DAMAGE TO THE FIRST KNUD-1 SPACECRAFT, AND THE LOSS OF THE KNUD-2 HARVESTING OPERATION ON FLOYD-4	21
A.	URA is liable for the loss of or damage to the first KNUD-1 spacecraft.....	21
1.	URA is liable under Article III LIAB	21
a)	The damage to KNUD-1 is covered under the LIAB	21
b)	The damage was “caused by” TYRUS	22
c)	URA is at fault	22
2.	URA is liable under Article VII OST	23
3.	URA is responsible under Article VI OST and the general rules of State responsibility.....	24
a)	URA violated Article I OST	24
b)	URA violated Article IX OST	25
(1)	URA did not act with due regard to the corresponding interests of SPIDR.....	25
(2)	URA did not undertake consultations regarding the re-launch of TYRUS.....	26
B.	URA is liable for the loss of the KNUD-2 harvesting operation on Floyd-4.....	27
1.	URA hampered SPIDR’s harvesting operation on Floyd-4.....	27
a)	SPIDR had the legal right to harvest Floyd-4.....	27

(1) The harvesting of the resources of celestial bodies is lawful	27
(2) Property rights exist on the harvested natural resources of celestial bodies ...	28
b) URA ignored SPIDR’s priority rights to exploit Floyd-4.....	29
2. URA is liable under Article III LIAB	31
a) The damage to KNUD-2 is covered under the LIAB	31
b) The damage was caused by TYRUS.....	31
c) Loss of profits constitutes damage under the LIAB	31
d) URA is at fault	32
3. URA is liable under Article VII OST	33
4. URA is responsible under Article VI OST and the general rules of State responsibility.....	33
a) URA violated Article I OST	33
b) URA violated its duty to undertake international consultations under Article IX OST.....	33
c) URA violated its duty to inform under Article XI OST	34
C. Even if URA had the right to free access on Floyd-4 under Article I OST, it abused this right.....	34
SUBMISSIONS TO THE COURT	xxxviii

LIST OF ABBREVIATIONS

ARSIWA	International Law Commission Articles on Responsibility of States for Internationally Wrongful Acts
Compromis	Special Agreement between the United Republic of Adventura and the Sovereign Peoples Independent Democratic Republic
e.g.	<i>exempli gratia</i>
FUSA	Federal URA Space Agency
GA	General Assembly
GEO	Geostationary Orbit
I.C.J.	International Court of Justice
I.C.J. Statute	Statute of the International Court of Justice
<i>Ibid.</i>	<i>ibidem</i>
ITU	International Telecommunication Union
KNUD	Kosmic Near-Earth Utility Developer
LIAB	Convention on International Liability for Damage Caused by Space Objects
MA	Agreement Governing the Activities of States on the Moon and Other Celestial Bodies
NEO	Near-Earth Object
OST	Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies
P.C.I.J.	Permanent Court of International Justice
SPIDR	The Sovereign Peoples Independent Democratic Republic
TYRUS	Twelve Yard Resource Utilization System
UN	United Nations
UN Charter	Charter of the United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNCOPUOS	United Nations Committee on the Peaceful Uses of Outer Space
URA	The United Republic of Adventura
URAC	The URA Consortium
v.	versus
VCLT	Vienna Convention on the Law of Treaties
Vol.	Volume

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QUESTIONS PRESENTED

(i) Whether URA is liable for damages under international law to SPIDR for changing the orbit of Syd-1, which resulted in the loss of life and damage to Dropgum;

(ii) Whether URA is liable under international law for the loss of or damage to the first KNUD-1 spacecraft, and the loss of the KNUD-2 harvesting operation on Floyd-4; and to dismiss all claims to the contrary.

STATEMENT OF AGREED FACTS

1. The United Republic of Adventura (URA) and the Sovereign Peoples Independent Democratic Republic (SPIDR) are separated by the Cold Ocean, a large body of water with URA on its Western shores and SPIDR sharing its Eastern shores with a number of other countries. Both have major space agencies conducting civil space activities: the Federal URA Space Agency (FUSA) and the SPIDR Space Agency.

2. FUSA and the SPIDR Space Agency have developed programs to address potential threats posed by near-Earth objects (NEOs). In addition, URA and SPIDR have been actively engaged in the Working Group on Near-Earth Objects of the United Nations Committee On Peaceful Uses of Outer Space (UNCOPUOS).

3. URA is the lead state of a consortium of nations which was formed for the purpose of developing capabilities to address actual collision threats posed by individual NEOs. Those programs focus on development of "gravity tractors" to deflect NEOs such that they do not pass through any threatening "keyholes". The URA Consortium (URAC) also licenses the utilization of NEO resources. All of the members of the Consortium have signed or ratified the Moon Agreement, however, not all the States that have signed or ratified the treaty are part of the URAC.

4. On 1 February FUSA launched an unmanned space station, the Titanium Autonomous Save-the-Earth Robotic Orbiting Industrial Depot (TASEROID), in an Earth orbit at an altitude of approximately 1,000 km, as an on-orbit warehouse for consumables. FUSA

uses the depot for its own space activities and stores and then sells oxygen, hydrogen, and other natural resources brought back from NEO missions to other space-faring nations or commercial entities.

5. FUSA also started development of TYRUS (Twelve Yard Resource Utilization System), a robotic space system designed to be launched to NEOs in order to harvest valuable mineral resources there and deliver them to TASEROID, in July 2010.

6. Meanwhile, the SPIDR Space Agency had developed its own national space program, which included the establishment and operation of a highly capable manned space station in Earth orbit. SPIDR also conducted a very well-organized NEO program; thus, in 2003, SPIDR had realized before anyone else that Floyd-4, a pig-shaped asteroid of some 600 by 150 by 200 meters in size, would make a near-Earth pass in June 2011. The SPIDR Space Agency publicly shared this discovery, by announcing that its calculations undertaken in April 2010 had shown a heightened likelihood for Floyd-4's trajectory to present a serious risk of colliding with Earth sometime in the future. The SPIDR Space Agency also announced that it had been preparing a highly capable robotic spacecraft called KNUD-1 (Kosmic Near-earth Utility Developer) to visit the asteroid and if possible land on it to conduct scientific research as part of its NEO assessment and threat mitigation program. KNUD-1 was launched in November 2010.

7. Over the spring of 2011, based on the general scientific information already available regarding Floyd-4, FUSA singled out that same asteroid as a particularly interesting

target for its own first mission, with a second nearby pass in February 2024 giving rise to a launch window of less than two months in the course of late 2023. While KNUD-1 was en route, FUSA scientists examined Floyd-4 from Earth with telemetry using ground based equipment and lunar-orbiting spacecraft, and concluded that it probably was a carbonaceous chondrite containing deposits of water and hydrocarbons. At a press conference in May 2011 FUSA announced that after this telepresence, FUSA planned to establish physical presence on Floyd-4 by sending the first TYRUS mission to the NEO.

8. This announcement gave rise to public protests and heated debate within SPIDR as the TYRUS mission was viewed as an affront to the SPIDR space program. The SPIDR government published an official statement on 1 June 2011 which clarified SPIDR's priority rights to any use or exploitation of Floyd-4. Additionally, KNUD-1 was due to arrive at the NEO later that month, and that once KNUD-1 attached to Floyd-4 only the SPIDR Space Agency would have the competence to properly judge the safety risks involved in attaching a second craft to the surface, including possible risks of altering the structural consistency and/or orbital characteristics of the asteroid. The SPIDR Space Agency issued a press release that declared that it had authorized the development of a much larger and highly competent spacecraft, KNUD-2, to visit Floyd-4 during its next pass close to Earth during February 2024, to harvest the resources of the NEO and deliver any resources so collected to the SPIDR space station.

9. While in transit to the NEO, sensors on board KNUD-1 examined Floyd-4 and designated the most feasible and convenient attachment site on the asteroid, due to its

complicated topography. KNUD-1 arrived at Floyd-4 as scheduled, and after orbiting the asteroid for a few weeks, successfully touched down at the designated attachment spot on the NEO's surface and anchored itself without any problems to the asteroid's regolith in June 2011. In the following months, KNUD-1's scientific instruments radioed back a wealth of information on the Floyd-4 which was widely shared with the global space operator and scientific community. Notably, KNUD-1 confirmed that Floyd-4 was a carbonaceous chondrite and contained significant deposits of water and hydrocarbons.

10. The URAC decided to commercially exploit the resources of Floyd-4 to provide a funding source for further space activities. The URAC invited private entities to develop different technologies. In return, the URAC stated it would license such private entities to undertake missions to Floyd-4 as well, for the purpose of harvesting the already limited mineral resources there. The URAC declared that there was a moratorium on the extraction and exploitation of the resources of Floyd-4 and other NEO's pending the issuance of the licenses, and that only those entities from States which are party to the Moon Agreement would be allowed to apply for a license.

11. Both SPIDR and URA issued periodic warnings to each other not to interfere with or otherwise put at risk their own respective missions. During the meetings of UNCOPUOS, URA and SPIDR each asserted they had the right under international law to land on Floyd-4 and conduct their respective missions on the asteroid. Both FUSA and the SPIDR Space Agency proceeded with preparations for their respective missions.

12. FUSA launched TYRUS on 22 October 2023. The spacecraft rendezvoused with Floyd-4 on 6 February 2024, and tried to touch down in the same preferred attachment area as KNUD-1. After many unsuccessful attempts, TYRUS eventually managed to attach itself to the asteroid, altering the surface of the NEO in the process.

13. SPIDR had made a great effort to launch KNUD-2 before the launch of TYRUS, however the original launch date of KNUD-2 was postponed because of minor anomalies. Ultimately, the spacecraft was launched on 3 December 2023, a few days before the launch window for Floyd-4 closed.

14. Following the launch, SPIDR announced that KNUD-2 was scheduled to arrive at Floyd-4 on 7 March 2024. SPIDR publicly summoned FUSA to ensure that TYRUS would have disengaged from its position by that date to allow KNUD-2 upon its arrival to use the same preferred attachment area where the KNUD-1 had attached to the surface. SPIDR stated that the presence of TYRUS in the proximity of the attachment area substantially increased the risk of a failure in attaching KNUD-2 to the NEO. However, neither URA nor the URAC made any public response to the demand to disengage TYRUS.

15. While TYRUS was undertaking its first inspection of Floyd-4 from its attached site on the surface and KNUD-2 was making its way to the same site, new developments took place with respect to an asteroid named Syd-1. Syd-1 was a diamond-shaped NEO

estimated to be about 100 meters in size, with a preliminary indication of being a carbonaceous chondrite.

16. Syd-1 had already been detected by FUSA in 2020, and had been estimated at the time to have a chance in the order of 1 to 650 of colliding with the Earth on 27 October 2031 because of a keyhole in its trajectory which it was scheduled to pass on 27 October 2028. On 17 February 2024, however, FUSA recalculated its estimation to a 1 in 80 chance of Syd-1 encountering the keyhole resulting therefore in a subsequent impact with Earth on 27 October 2031. The risk corridor of potential impact points was shown to cross the Earth passing over both URA and SPIDR as well as the Cold Ocean between the two countries, with the Earth situated approximately at the center of the uncertainty ellipse.

17. FUSA also calculated that, within six months, Syd-1 would happen to enter a window whereby it would be in a position where the TYRUS could be re-launched from Floyd-4 and rendezvous with the Syd-1. This would offer the opportunity to redirect the TYRUS mission to act as a gravity tractor on Syd-1, causing the asteroid to change velocity so as to avoid Earth. Once that objective would have been achieved, according to FUSA's own calculations, any valuable natural resources on Syd-1 could also start to be harvested, if feasible.

18. After various rapidly drafted options for addressing the threat posed by Syd-1 had been discarded, on 26 February 2024, FUSA unilaterally announced that URAC would

re-launch TYRUS from Floyd-4, fly it to Syd-1, confirm whether the asteroid was indeed on a trajectory for the keyhole, and if so, employ gravity tractor for the asteroid to miss the keyhole.

19. Four days later, TYRUS was re-launched from Floyd-4 without any consultations. However, it knocked KNUD-1 over in the process, causing its antenna to be oriented down toward the surface of the asteroid. This resulted in the loss of all communications to and from KNUD-1. TYRUS thus rendered KNUD-1 incommunicable and uncontrollable, since SPIDR could no longer operate it.¹ TYRUS reached Syd-1 on 19 August 2024. Based on TYRUS transponder tracking shortly after arrival, it was determined that the asteroid was indeed headed for the 2028 keyhole and that the nominal impact point of Syd-1 in 2031 would lie in the Cold Ocean between URA and SPIDR. Within three days FUSA decided, once again unilaterally, to station the spacecraft ahead of the asteroid to speed it up in order to ensure that the asteroid would miss the 2028 keyhole. Within three more days, FUSA announced that TYRUS had been able to move itself into a relatively stationary position ahead of the asteroid, and that the process of gravity tractor to gradually speed it up had been initiated.

20. Following the announcement of the decision on 22 August 2024 to speed up Syd-1, the SPIDR Space Agency calculated that the effects of the TYRUS mission on the asteroid would amount to virtually dragging the potential impact point across the surface of, *inter alia*, SPIDR before it would disappear off the Earth altogether. This also meant

¹ Clarification 12.

that if something went wrong in the course of TYRUS' operations, the chances of Syd-1 actually crashing into SPIDR territory would be considerably larger.

21. The government of SPIDR consequently protested in various fora, most notably UNCOPUOS, against the "unilateral decision by FUSA to put SPIDR at greater risk", where moving the Syd-1 in the other direction - that is slowing it down rather than speeding it up - "would have virtually moved the possible impact points over a considerably smaller amount of territory before disappearing off the earth altogether, even if that would have included a portion of URA territory".

22. Meanwhile, on 7 March 2024 KNUD-2 rendezvoused with Floyd-4 according to plan and found the preferred attachment site available since TYRUS had already left. However, KNUD-2 had a difficult time successfully attaching to the NEO, since TYRUS had previously altered the physical structure of the surface, while unsuccessfully attempting to attach. This caused the irretrievable damage of KNUD-2's scientific instruments which were planned to further investigate Floyd-4. In addition, the solar panels of KNUD-2 were damaged as well and could operate only at 30% of their intended capacity.

23. Consequently, KNUD-2, instead of remaining on Floyd-4 for over three years as originally intended, had to depart just four months after docking, on 4 July, in order to safely make it to the SPIDR manned space station. It did so on 20 August 2024, and delivered just 10% of the resources intended to have been extracted from Floyd-4.

24. The government of SPIDR immediately issued a statement that it held URA responsible and liable for the damage caused to KNUD-2 and the consequent limitations to the ability of KNUD-2 to harvest any valuable minerals. URA responded by claiming the right to prior harvesting in combination with its decision to redirect the TYRUS mission to mitigate the threat posed by Syd-1 for the benefit of SPIDR as well as the rest of mankind.

25. The orbit of the Syd-1 was slightly altered by the gravity tractor, however it was determined after the keyhole event of 2028 that the risk corridor for the 2031 encounter did not completely miss the Earth but rather moved toward the SPIDR coast of the Cold Ocean.

26. In September 2031, the asteroid entered the atmosphere and produced an airburst with the estimated equivalent of 2.1 megatons of TNT at an altitude of roughly 10.1 kilometers over the Cold Ocean near SPIDR. The airburst completely destroyed the town of Dropgum, a fishing village located on the coast in northern SPIDR. Mass evacuations had been conducted along the impact corridor within SPIDR in advance of the impact, including Dropgum, and the loss of life was held to dozens of people.

27. Ensuing diplomatic discussions failed to resolve the dispute. Both States agreed to bring their dispute before the International Court of Justice by way of this Compromis.

28. Both URA and SPIDR are parties to the Outer Space Treaty, the Rescue Agreement, the Liability Convention, the Registration Convention, the UN Charter, the ITU Constitution and ITU Convention, as well as members of the UNCOPUOS Working Group on Near-Earth Objects, having signed up to the general commitments undertaken in that context. URA is a party to the Moon Agreement.

SUMMARY OF ARGUMENTS

I. URA IS LIABLE FOR DAMAGES UNDER INTERNATIONAL LAW TO SPIDR FOR CHANGING THE ORBIT OF SYD-1, WHICH RESULTED IN THE LOSS OF AND DAMAGE TO DROPGUM

A. URA is liable under Article II LIAB for the loss of life and damage to Dropgum. The damages suffered by Dropgum constitute loss of life and damage to property under Article I LIAB. Since the damages are indirect and there is adequate and proximate causal link with TYRUS' gravity tractor operation on Syd-1, they are compensable under the LIAB. No fault is required in order for URA to be held liable. Thus, URA is under an obligation to provide SPIDR with compensation under Article XII LIAB to the condition which would have existed if the damage had not occurred.

B. URA is liable the destruction of Dropgum, as it violated rules of the *corpus juris spatialis*. URA breached its duty to cooperate in outer space and did not achieve an international response to the Syd-1 threat, pursuant to Article IX OST as well as the COPUOS Recommendations on NEO threat mitigation. URA failed to act with due regard to the corresponding interests of all States, due to its unilateral decision to put SPIDR at greater risk through the alteration of Syd-1's trajectory. In parallel, URA introduced adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and did not take appropriate measures under Article IX OST.

C. URA is responsible for the destruction of Dropgum under general international law. It violated the customary rules of preventive action and the 'no harm' principle,

by causing damage to the environment to SPIDR *via* its gravity tractor operation on Syd-1, which resulted in the total destruction of Dropgum.

D. URA cannot claim that the wrongfulness of its action is precluded. A claim of URA to be exempted from responsibility based on the defense of necessity must be dismissed by the Court, as the requirements for its invocation are not satisfied.

II. URA IS LIABLE UNDER INTERNATIONAL LAW FOR THE LOSS OF OR DAMAGE TO THE FIRST KNUD-1 SPACECRAFT, AND THE LOSS OF THE KNUD-2 HARVESTING OPERATION ON FLOYD-4

A. URA is liable for the loss of or damage to KNUD-1

1. URA is liable under Article III LIAB for the damage to KNUD-1. Since the damage was directly caused to KNUD-1 by TYRUS' re-launch from Floyd-4 and URA is at fault, the damage is compensable under the LIAB.

2. URA is equally liable under Article VII OST, on the basis of objective liability. The prerequisites of damage and causal link are satisfied in the present case.

3. URA is internationally responsible under Article VI OST and the ARSIWA, for the violation of space law. URA failed to act for the benefit and in the interests of all States as established under Article I OST, by knocking over KNUD-1, which rendered the spacecraft uncontrollable and incommunicable. Additionally, URA did not act with due regard to the corresponding interests of all States by hampering SPIDR's KNUD-1 mission during TYRUS' re-launch, and did not undertake consultations before re-launching TYRUS in order not to harmfully interfere with KNUD-1.

- B. URA is liable for the loss of the KNUD-2 harvesting operation on Floyd-4
1. SPIDR had the right to proceed with the harvesting of Floyd-4. The right to free use of celestial bodies granted under Article I OST includes the use and exploitation of celestial bodies for economic benefit. Since property rights exist of the extracted resources of celestial bodies and SPIDR had established priority rights on Floyd-4 in accordance with international space law, SPIDR was entitled to proceed with its harvesting operation. Its right was disregarded and its operation was unlawfully hindered by URA, as KNUD-2 was severely damaged during landing, due to alterations on the surface of Floyd-4 caused by TYRUS.
 2. URA is liable under Article III LIAB for the damage to KNUD-2 and the loss of its harvesting operation. The damages to KNUD-2 are covered by the LIAB and there is proximate causal link between TYRUS' action and the damages to KNUD-2. The loss of KNUD-2's harvesting operation constitutes loss of profits, which is covered under the LIAB as compensable indirect damage. Finally, URA is at fault.
 3. URA is equally liable under Article VII OST for the loss of KNUD-2's harvesting operation on Floyd-4.
 4. URA is responsible under Article VI OST and the general rules on State responsibility. URA violated Article I OST, since it acted against the interests of SPIDR, by irretrievably damaging KNUD-2 and hampering the harvesting operation on Floyd-4. URA also breached its duty to undertake consultations before launching

TYRUS and failed to inform SPIDR of the results of its TYRUS mission under Article XI OST.

C. Even if URA had the right to free access on Floyd-4 under Article I OST, it abused its right. In case it is found that URA's action was not unlawful in the sense of being prohibited, it caused injury to SPIDR and, therefore, URA is internationally responsible.

ARGUMENT

I. URA IS LIABLE FOR DAMAGES UNDER INTERNATIONAL LAW TO SPIDR FOR CHANGING THE ORBIT OF SYD-1, WHICH RESULTED IN THE LOSS OF AND DAMAGE TO DROPGUM

URA is liable to SPIDR for the loss of life and damage caused to Dropgum after changing the orbit of Syd-1, under the LIAB. In doing so, URA must also be found responsible for the violation of primary rules of the OST. Furthermore, URA's action violated fundamental principles of international environmental law. Finally, it is submitted that URA cannot invoke the existence of circumstances precluding the wrongfulness of its actions.

A. URA is liable under Article II LIAB for the loss of life and damage to Dropgum

According to Article II LIAB, "a launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth [...]."¹ In the present case, Article II is applicable since its conditions are indeed fulfilled:

1. The destruction of Dropgum constitutes damage under Article I LIAB

Article I(a) LIAB stresses that the term "damage" includes "loss of life, personal injury or other impairment of health; or loss of or damage to property."² The definition of damage is broad, as is the scope of application of the Convention.³ According to the agreed facts, the town of Dropgum was completely destroyed and the loss of life was held

¹ Article II, LIAB.

² Article I, LIAB.

³ Kerrest/Smith II, 113.

to several dozen people.⁴ This resulted from the gravity tractor operation of TYRUS, which altered the orbit of Syd-1, resulting in the risk corridor moving toward the SPIDR coast of the Cold Ocean.⁵ Subsequently, the asteroid produced an airburst over the Cold Ocean near SPIDR. Following the provisions of LIAB, both loss of life and damages to property fall within the scope of Article I(a).

2. The damages sustained by Dropgum are covered under Article II LIAB

The Respondent might argue that the damage caused to Dropgum by Syd-1's entrance in the atmosphere is an indirect one and, thus, it is not covered by the LIAB. In this respect, SPIDR submits that, although the damage to Dropgum is indeed indirect (a), the LIAB covers not only direct but also indirect damages (b). It follows that URA must be held absolutely liable under Article II LIAB for indirect damages caused to Dropgum, as there is proximate causal connection between TYRUS' gravity tractor and the damages (c). Therefore, URA is under an obligation to pay compensation for the damages caused by its TYRUS mission.

a) The damage caused to Dropgum is indirect

In the present case, it was calculated by FUSA, URA's Space Agency, that Syd-1 was heading for the 2028 keyhole, being quite certain that it would collide with the Earth in the future. It was FUSA's unilateral decision to try to mitigate the threat posed by Syd-1 which resulted in the alteration of the asteroid's trajectory, *id est*, the shift of its risk corridor toward the SPIDR coast of the Cold Ocean.⁶ As already submitted, this action inevitably caused the loss of life of several dozen people and the total destruction of

⁴ Compromis, § 26.

⁵ Compromis, § 25.

⁶ *Ibid.*

Dropgum. Hence, these losses constitute damages connected to and indirectly caused by TYRUS' gravity tractor, as the consequences of this initial act.

b) The LIAB covers both direct and indirect damages

Article II LIAB establishes that in cases of damage caused by the space object of a launching State on the surface of the Earth or to aircraft in flight, that State shall be absolutely liable to pay compensation for such damage.⁷ Thus, Article II contains a non-fault based liability system, in which liability is automatic and unlimited, providing full compensation for victims.⁸ However, the Convention does not comprise any further explanation or reference as to whether only direct or indirect damage are covered as well; nor does any international legal document stipulate that only direct damages are covered by said Article.⁹ Damage in the context of Article II LIAB would be direct if it flowed directly and immediately from the operation of a space object, e.g. damage caused by contact with a space object.¹⁰ A damage without those characteristics, which is remote or consequential to the act, would be indirect.¹¹ Indirect damage is in any event not explicitly denied.¹² On the contrary, the compensability of indirect damage is widely accepted in legal doctrine.¹³ Furthermore, it is contended that the omission of any requirement regarding the way in which damage occurs leads to the conclusion that both types of damage, directly and indirectly caused, are included.¹⁴ Specifically, it has been

⁷ Article II, LIAB.

⁸ Kerrest/Smith II, 121-122.

⁹ Mosteshar, 404; Lee, 194, 225.

¹⁰ Carpanelli/Cohen, 2.

¹¹ Christol, 346, 359-362; Report of CASS.

¹² Burke, 282; CHRISTOL, THE MODERN INTERNATIONAL LAW, 96.

¹³ Foster, 158; Carpanelli/Cohen, 5; HURWITZ, 15.

¹⁴ DeBusschere, 101, 102 ; VAN BOGAERT, 172; Foster, 157, 158.

elaborated that the operating state of a space mission which causes damage on Earth as a consequence of only partially deflecting an asteroid is absolutely liable for that damage.¹⁵

Apart from that, this reasoning is enforced via treaty interpretation. Therefore, recourse must be made to the rules of interpretation of the 1969 VCLT in order to clarify Article II LIAB in this respect. In citing the general rule and the supplementary means of interpretation of treaties, Articles 31 and 32 VCLT codify customary international law.¹⁶

Article 31 VCLT emphasizes that a treaty shall be interpreted “in the light of its object and purpose”.¹⁷ The purpose of the LIAB is stressed in its Preamble which, according to the VCLT, is considered as an integral part of the text of a treaty¹⁸. More explicitly, States Parties recognize, *inter alia*, the need to ensure, in particular, the prompt payment under the terms of this Convention of a full and equitable measure of compensation to victims of such damage and seek to elaborate effective international rules and procedures concerning liability.¹⁹ It follows that the LIAB is a victim-oriented treaty, with a primary aim to protect individuals from the activities of those undertaking an inherently dangerous activity.²⁰ Since the purpose of the Convention is to ensure a prompt payment, *id est*, the efficient protection of the victims of damage caused by space objects, “damage” must be interpreted so that it includes both direct and indirect damage.²¹

Therefore, the recovery must be authorized for damages resulting both from a direct

¹⁵ ASE, 50.

¹⁶ SHAW, 839; Criddle, 2; Arbitral Award of 31 July 1989 (Judgment).

¹⁷ Art. 31, VCLT; Territorial Dispute 1994 (Judgment).

¹⁸ Art. 31(2), VCLT.

¹⁹ Preamble to the LIAB.

²⁰ Kerrest, 92.

²¹ SANDS, 898.

contact and for the indirect or consequential aspects caused by the operation of a spacecraft.²²

The settlement of Soviet Cosmos 954 incident also supports this view. After the satellite crashed on Canadian territory in 1978, the government of Canada addressed a claim to the Soviet Union based on the LIAB.²³ This incident constitutes subsequent State practice,²⁴ reaffirming the compensability of indirect damage.

c) The causal connection between TYRUS' gravity tractor and the damage to Droptum is adequate and proximate

Article II LIAB stresses that damage must be “caused by” the space object of a launching State.²⁵ It follows that a causal link must exist between the damage and the space object, in order for the former to be compensable under Article II.²⁶ The required degree of causality for liability to arise is determined as adequate and proximate.²⁷ A cause is defined as adequate when the outcome flows from the conduct in natural sequence. With regards to proximity, there must be proof of an uninterrupted initial causal link, namely of the absence of intervening causes “cutting off” the initial course of action.²⁸ Moreover, “caused by” can also be interpreted as simply directing attention to the need for a causal connection between the operation and the damage. It is the Applicant’s submission that causation under the aforementioned requirements is

²² *Supra*, note 13.

²³ “Cosmos 954” Settlement of Claims, Article I.

²⁴ Article 31(3) (b), VCLT.

²⁵ Article II, LIAB.

²⁶ *Supra*, note 20, at 97-99.

²⁷ Cheng, Liability, 115; Arangio-Ruiz, 12; Gorove, 141; Dembling, 135.

²⁸ Castellanos-Jankiewicz, 46-47; CHRISTOL 1991, 223; Smith, 257.

established. Any damage, therefore, that is one way or another linked with the initial act is compensable under LIAB.²⁹

Furthermore, it is submitted that the action must be the actual cause of damage, a *sine qua non* condition for its occurrence,³⁰ so that damage would not have occurred “but for” the initial action.³¹

In this case, the facts evolved in the following sequence: TYRUS initiated the gravity tractor of Syd-1 to speed up the orbit of the asteroid. The orbit of Syd-1 was thus altered.³² Nevertheless, Syd-1 did not miss the 2028 keyhole event and its collision with the Earth became certain.³³ Therefore, it was due to TYRUS’ intervention that the risk corridor did not miss the Earth, but rather moved toward the SPIDR coast of the Cold Ocean. Moreover, there is no indication of any subsequent incident altering the causal link between URA’s action and the orbit of Syd-1, thus establishing adequacy and proximity. Because of this alteration in Syd-1’s trajectory, said asteroid entered the atmosphere in 2031 and produced an airburst which destroyed the town of Dropgum and killed several dozen people.³⁴ Thus, the damage caused to Dropgum resulted from TYRUS, launched by FUSA. Consequently, URA is liable towards SPIDR, under Articles I and II LIAB.

3. No fault is required for liability to arise

The damages to property and the loss of life suffered by SPIDR occurred on the surface of the Earth, therefore Article II LIAB is applicable. This Article highlights that a

²⁹ Kerrest, at 91-93,158.

³⁰ COMBACAU/SUR, 545 ; MPEPIL, *Compensation*.

³¹ HART/HONORE, at 114-121.

³² Compromis, §§19, 25.

³³ Compromis, footnote 2.

³⁴ Compromis, §§25, 26.

State does not need to be at fault to be held liable.³⁵ Given the fact that outer space activities are ultra-hazardous,³⁶ namely inherently dangerous, a higher standard of caution is imposed on States, so that only the prerequisite of damage is needed.³⁷

In the case at hand, TYRUS' gravity tractor operation on Syd-1 was potentially risky, as calculated by the SPIDR Space Agency³⁸ and as evidenced by the subsequent damages sustained to Dropgum. Indeed, had TYRUS not altered Syd-1's initial orbit, SPIDR would not have been exposed to greater risk and damage would have most probably been avoided.

Therefore, URA must be held absolutely liable for the damages to Dropgum.

4. URA is under an obligation to provide SPIDR with full compensation under Article XII LIAB

The issue of compensation for damages caused by outer space activities is regulated by Article XII LIAB. According to this Article, the measure of compensation to be granted to the injured State is such that will restore the State "to the condition which would have existed if the damage had not occurred".³⁹ This Article is therefore based on the applicable rule of international law *restitutio in integro ex ante*.⁴⁰ Nevertheless, international jurisprudence has ruled that, according to customary law, in case *restitutio in integro* is not possible, full monetary compensation would bear to cover the damages sustained by the claimant State.⁴¹

³⁵ LACHS 2010, 115; Rylands v. Fletcher.

³⁶ Soucek, 342; FAURE/YING, 328; BUNKER, 74; LACHS 2010, 115; VIKARI, 278; WASSENBERGH, 92; Marchisio, 176.

³⁷ Kerrest/Smith II, 118.

³⁸ Compromis, § 20.

³⁹ Article XII, LIAB.

⁴⁰ UN Doc. A/AC.105/85, 3; Williams International Law, 79; MATTE, 169.

⁴¹ Lusitania, 39; Chorzów Factory, 47.

In the present case, *restitutio in integro* is no longer possible, as several dozen people died and the town of Dropgum was completely destroyed. Consequently, compensation is owed to SPIDR by URA for the aforementioned losses.

B. URA is responsible for the destruction of Dropgum, as it violated rules of international law under the *corpus juris spatialis*

1. The general rules of international law are applicable in outer space

SPIDR also submits to this honorable Court that URA must be held internationally responsible for the destruction of Dropgum due to TYRUS' gravity tractor, under the rules of international law on responsibility of States. Pursuant to Article III OST, international law applies to outer space;⁴² this includes not only long-established rules of customary international law, but other branches, *inter alia*, international environmental law.⁴³

The regime of international responsibility of a State is reaffirmed in the OST, under Article VI, which states, *inter alia*, that "States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies."⁴⁴ Thus, for every activity in outer space, a State shall bear international responsibility, even for private operations,⁴⁵ as paragraph 2 of this Article broadens the scope of international responsibility in outer space. Responsibility shall be borne especially when violation exists of the other provisions of the OST.⁴⁶ Article VI is understood as a specification of the general scheme for State responsibility.⁴⁷ Therefore,

⁴² Article III, OST.

⁴³ Ribbelink, 67.

⁴⁴ Article VI, OST.

⁴⁵ LACHS, 22, 122.

⁴⁶ Gerhard, 104.

⁴⁷ Van Traa-Engelmann, 140.

Article VI is a secondary rule of international law, which stresses the requirements for international responsibility to arise regarding outer space activities, once a primary obligation is breached. In the OST, including its context as well as the *travaux préparatoires*, there is no indication or evidence that a deviation from the general concept of public international law was intended.⁴⁸

Articles III and VI OST provide a basis for invoking the responsibility of URA for damages to SPIDR under the general rules of international law on the responsibility of States, as codified in the “Articles on Responsibility of States for Internationally Wrongful Acts” (hereinafter 'ARSIWA'), adopted by the International Law Commission (hereinafter 'ILC') in 2001. ARSIWA are widely regarded as a codification of the customary law of State responsibility⁴⁹ and pre-existing rules, since the Commission was based on State practice and international jurisprudence.⁵⁰

The ARSIWA set out the consequences for the breach of primary rules.⁵¹ Article 1 ARSIWA stipulates that “every internationally wrongful act of a State entails the international responsibility of that State.” An internationally wrongful act exists when, according to Article 2, conduct consisting of an action or omission (a) is attributable to a State under international law and (b) constitutes a breach of an international obligation of this State.⁵² These elements are mentioned in several judicial decisions such as the

⁴⁸ *Supra* note 46, at 114.

⁴⁹ Rosenstock, 792; OLUFEMI, 173.

⁵⁰ BROWNLIE, 35-41.

⁵¹ Report of the ILC 53rd session.

⁵² ILC Yearbook, 34.

Phosphates in Morocco case,⁵³ the *Diplomatic and Consular Staff* case⁵⁴ and the *Dickson Car Wheel Company* case.⁵⁵

Therefore, the ARSIWA are applicable in the case at hand, with regards to responsibility, an issue extraneous to the LIAB. Indeed, URA has breached its primary obligations both under the *corpus juris spatialis* and general international law as will be elaborated below.

2. URA breached its duty to cooperate and did not achieve an international response to the threat posed by Syd-1

The first sentence of Article IX OST stresses that “[i]n the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of cooperation.” In the field of space law, the principle of international cooperation is widely accepted as a prerequisite for any State activities in outer space.⁵⁶ Legal doctrine is firm in stating that international cooperation is a statutory obligation, rather than a mere aim, verifying the binding character of the principle on States.⁵⁷ Equally, cooperation in good faith is a general obligation on all States, with the United Nations Charter defining “cooperation in solving international problems” as one of its purposes.⁵⁸ In addition, URA’s obligation is more apparent by the fact that cooperation is a principle of the OST,⁵⁹ the ITU Constitution⁶⁰ and the MA.⁶¹ Thus, it is evident that the principle of cooperation has permeated through all sectors of

⁵³ *Phosphates in Morocco* (Preliminary Objections).

⁵⁴ *Diplomatic and Consular Staff*.

⁵⁵ *Dickson Car Wheel*, 669.

⁵⁶ *Williams Derecho Internacional*, 489.

⁵⁷ Ferrer, 223.

⁵⁸ UN Charter, Article 1(3).

⁵⁹ Preamble to the OST; Article IX, OST.

⁶⁰ ITU Constitution, Article 1.

⁶¹ MA, Article 4(2).

international law, being a *sine qua non* condition in the lawful and orderly conduct of States.⁶² Specifically, this Court ruled in the *Nuclear Tests case* that “[t]rust and confidence are inherent in international co-operation, in particular in an age when this co-operation in many fields is becoming increasingly essential.”⁶³ Finally, the binding character of the Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States, and therefore the principle of cooperation, as *pars pro toto*, was verified in the jurisprudence of this Court.⁶⁴

The obligation of international cooperation in outer space has been further elaborated and specified under the auspices of the UNCOPUOS, concerning the mitigation of Near-Earth Objects (NEOs) -celestial bodies which might cross the Earth’s orbit.⁶⁵ As NEOs constitute a possible danger to the Earth, their mitigation requires an international and interdisciplinary approach. In 2001, the UNCOPUOS established an Action Team on Near-Earth Objects (Action Team 14), aiming to formulate recommendations of principles governing NEO threat mitigation. Additionally, the Scientific and Technical Subcommittee of COPUOS established, in 2007, a Working Group on Near-Earth Objects, to propose international procedures to address the NEO threat.⁶⁶

Paragraph 186 of the Report of the Scientific and Technical Subcommittee in 2013 stresses that “activities in protecting the Earth from an asteroid impact involved diverse and complex scenarios that could be best addressed through international cooperation.”⁶⁷

⁶² SHAW, 1205.

⁶³ Nuclear Tests, para 49.

⁶⁴ Nicaragua, para 191; Kosovo, para 80.

⁶⁵ Williams, 4, 5.

⁶⁶ A/RES/62/217.

⁶⁷ Report of Scientific and Technical Subcommittee; Interim report; A/RES/51/122; DAVIS, 14.

Paragraph 23 of the Action Team 14 Recommendations in 2011-2012 stipulates that “[r]esponse to the NEO impact hazard requires measures to detect, track and characterize the orbital and physical properties of potentially hazardous NEOs, as well as measures to modify the trajectory of such NEOs in order to prevent an impact and measures to limit the consequences on the ground.”⁶⁸ Concerning the long-term preparation and detection on planetary defense, there has been extensive practice from States and international organizations. Specifically, the European Space Agency has developed a multi-segment Space Situational Awareness Program. The European Commission established the NEO Shield preparing techniques’ program. Moreover, the Russian Federation operates the MASTER network of robotic telescopes for asteroid discovery.⁶⁹ It follows that the NEO threat can be effectively addressed only through international cooperation.

Albeit said recommendations are not a formal source of international law under Article 38 of the I.C.J. Statute, their elaboration was accompanied by an active participation of States, including SPIDR and URA.⁷⁰ Such participation is indicative of a positive *opinio juris*⁷¹ and a *consensus* of the international community with regard to their implementation. Although these recommendations are not binding themselves upon States, the duty to international co-operation is already established in Articles I and III of the Outer Space Treaty. Specifically, co-operation under Article III is an essential principle of both the UN Charter and the Friendly Relations Declaration of 1970 and has, therefore, binding character upon States. It is the principle of good faith that shapes

⁶⁸ Recommendations of the Action Team; Planetary Defense Conference Report, 11.

⁶⁹ DAVIS, 8, 9.

⁷⁰ Compromis, §§ 2, 30.

⁷¹ Argañarás, 8.

States' obligations. Therefore, the UN COPUOS Recommendations are regarded as an elaboration of the principle of co-operation, and must be followed by States.⁷²

Nevertheless, URA chose to ignore them. In this case, URA acted unilaterally in order to mitigate the threat posed to Earth by Syd-1. URA followed a unilateral course of action during the gravity tractor operation, contrary to the COPUOS Recommendations. Indeed, not only URA disregarded SPIDR's proposal for an effective threat mitigation technique,⁷³ but also the alternative options assessed in URAC were rapidly discarded and URA proceeded unilaterally in an attempt to mitigate the threat.⁷⁴ It also failed to determine the risk of potential damage to SPIDR by Syd-1. URA did not operate any long-term preparation or telescoping system so as to be prepared for Syd-1's threat, contrary to current widespread practice. Consequently, URA did not verify the alteration of Syd-1's orbit and thereby did not inform SPIDR of the consequences, as owed to.⁷⁵ Following this unilateral action, URA failed to effectively mitigate the threat posed by Syd-1, which caused significant damage to SPIDR. Since URA did not act in accordance with its duty of international cooperation under the COPUOS Recommendations, it is internationally liable for the damage to Dropgum.⁷⁶

3. URA did not act with “due regard to the corresponding interests of all States Parties to the OST”

SPIDR submits that URA has simultaneously violated the “due regard” principle under Article IX OST, stressing that States shall conduct all their activities in outer space,

⁷² CRAWFORD, 723; Land and Maritime Boundary 1998 (Preliminary Objections) 4; Kolb, 872.

⁷³ Compromis, §§20, 21.

⁷⁴ Compromis, §18.

⁷⁵ Compromis, §25.

⁷⁶ Report of the Scientific and Technical Subcommittee; Interim report.

including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty.⁷⁷ The principle of due regard encapsulated in Article IX imposes the duty to explore and use outer space and conduct space activities with a certain standard of care, taking into account the rights and interests of other States.⁷⁸ This duty was first introduced in the field of air law⁷⁹ and then included in the OST, thus being generally accepted as legally binding. The degree of care is measured *ad hoc*, so that it is appropriate to the demands of the particular case.⁸⁰ Specifically, it must be proven, in the context of an activity in outer space, beyond reasonable doubt, that everything were made to avert the occurrence of harm.⁸¹

In the case at hand, however, no such proof can be established. URA's TYRUS interfered with Syd-1's trajectory and altered it. In response, the SPIDR Space Agency warned that, if something went wrong, the risk and chances of Syd-1 actually crashing into SPIDR territory would be considerably larger.⁸² This "unilateral decision by FUSA to put SPIDR at greater risk" disregarded the interests of SPIDR. As a result, URA acted solely for its own interests, and did not perform the mitigation technique with due regard to the corresponding interests of all other States Parties to the Treaty.

4. URA failed to avoid adverse changes to the environment of the Earth resulting from the introduction of extraterrestrial matter and failed to undertake appropriate measures under Article IX OST

Article IX OST further stresses that States "shall pursue studies of outer space, including the Moon and other celestial bodies and [...] conduct exploration of them so as

⁷⁷ Article IX, OST.

⁷⁸ Marchisio, 175.

⁷⁹ Article 3(d), Chicago Convention.

⁸⁰ BLACK'S 4th edition.

⁸¹ Marchisio, 176.

⁸² Compromis, §20.

to avoid [...] 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.”⁸³ This is a primary rule of international law whose violation brings about the international responsibility of States.

In the present case, Article IX OST has been violated by URA, whose spacecraft caused adverse changes to SPIDR’s territory through its gravity tractor operation and the measures adopted unilaterally were inappropriate.

Article IX OST refers to “adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter.” The notion of “adverse changes” is closely related to that of “harmful contamination” which refers to a contamination that is capable of causing significant harm.⁸⁴ In parallel, the obligation to take all appropriate measures to prevent harm, or to minimize the risk thereof, is not confined to activities appreciated as presenting such a risk, but extends to identification of a possible risk involved in any activity in outer space.⁸⁵ It requires reasonable efforts by a State to inform itself of factual and scientific data regarding a contemplated activity and address it through measures in timely fashion. Said Article must be read in conjunction with Article 7 (1) MA, which imposes the obligation on States to take measures to avoid the disruption of the existing balance of outer space and “also take measures to avoid harmfully affecting the environment of the Earth through the introduction of extraterrestrial matter or otherwise.”⁸⁶

⁸³ Article IX, OST.

⁸⁴ Cypser, 315, 324.

⁸⁵ Marchisio, 177.

⁸⁶ MA, Article 7.

In the case at hand, the asteroid's entering the atmosphere of the Earth due to TYRUS' gravity tractor of Syd-1 constitutes "introduction of extraterrestrial matter". The subsequent airburst led to the total destruction of Droggum, loss of lives and damage to properties in SPIDR territory.⁸⁷ Such damage constitutes an "adverse change" of SPIDR territory, as human lives cannot be revived and the environment cannot be restored to its pre-existing shape. Moreover, the measures undertaken by URA were inappropriate: it did not take into consideration the warnings of the SPIDR Space Agency about increasing the risk of potential damage to SPIDR and disregarded the alternative proposal of the Applicant's government.⁸⁸ Thus, URA has violated its obligations under Article IX OST.

C. URA is responsible for the destruction of Droggum under general international law

Under general international law, States are prohibited from conducting activities without regard for the rights of other States. States' obligations may arise from conventional rules, but also from international custom, as evidence of a general practice accepted as law.⁸⁹ It is widely supported that a duty of prevention of harm already exists, not just as a rule of responsibility for injury *ex post facto*,⁹⁰ but imposing the adoption of appropriate measures before actual damage has occurred, or to exert a State's best possible efforts to minimize the risk.⁹¹ International jurisprudence and legal doctrine consistently reaffirm the existence of the principle⁹² and its application to the

⁸⁷ Compromis, §26.

⁸⁸ Compromis, §§20,21.

⁸⁹ Article 38 (1)(b), I.C.J. Statute.

⁹⁰ BIRNIE/BOYLE, 95.

⁹¹ SANDS/PEEL, 201.

⁹² Trail Smelter; Lac Lanoux; Baxter, 247.

environment as a principle of general international law.⁹³ As crystallized in Principle 21 of the Stockholm Declaration,⁹⁴ the prevention principle has acquired the status of customary law,⁹⁵ stressing the responsibility of States “to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States.”

Furthermore, a fundamental rule of customary nature is the “no harm” principle,⁹⁶ namely a State’s duty not to cause damage to the environment of other States. This customary obligation has been emphasized by the I.C.J.⁹⁷ Notably in the *Corfu Channel* case, the Court stressed a State’s obligation “not to allow knowingly its territory to be used for acts contrary to the rights of other States”.⁹⁸ The application of the principle extends to situations where harm is caused by an activity not within the territory of a State, but merely under its control e.g. a polluting spacecraft.⁹⁹ Therefore, it has evolved so as to forbid States to cause damage to the environment of other States due to their activities.¹⁰⁰

The aforementioned principle, in conjunction with the principle of prevention, is codified under Principle 21 of the 1972 Stockholm Declaration and has been reiterated in Principle 2 of the 1992 Rio Declaration,¹⁰¹ reflecting a customary rule of international law.¹⁰² What is more, the obligation not to cause environmental damage is absolute, thus

⁹³ Iron Rhine case.

⁹⁴ A/Conf.48/14.

⁹⁵ De Sadeleer, 182; A/RES/3049 112.

⁹⁶ French, 5.

⁹⁷ Legality of Nuclear Weapons, 226, 242; Gabčíkovo-Nagymaros (Judgment) 7.

⁹⁸ Corfu Channel (Merits), 4.

⁹⁹ RUWANTISSA, 62, 63; VIKARI, 150.

¹⁰⁰ SHAW, at 851-853; HILIER, 808.

¹⁰¹ A/Conf.151/26, 874.

¹⁰² Handl, 534; Leigh, 134,135; Okowa, 280.

it is valid irrespective of fault.¹⁰³ However, even if fault is normally required, it is accepted that an exception is justified once the activity of the State is ultra-hazardous.¹⁰⁴

In the present case, by applying gravity tractor on Syd-1, URA damaged the environment of SPIDR. Indeed, it is TYRUS's activity of altering the trajectory of Syd-1, which was under URA control, which caused damage to SPIDR.¹⁰⁵ No appropriate measures were taken by URA in order to minimize the risk of collision; the alternative options for addressing the threat were rapidly discarded, indicating the absence of substantial determination of the risk.

Taking into consideration that outer space activities are *par excellence* ultra-hazardous,¹⁰⁶ URA's gravity tractor operation does not demand fault for URA to be responsible. Furthermore, given that URA had developed other threat mitigation programs under the auspices of URAC,¹⁰⁷ extreme care was reasonably expected.

On the other hand, substantial damage to the territory of the injured State is a precondition for the no harm principle to be breached.¹⁰⁸ Damage is "substantial" if the injured State can no longer exercise its rights. Accordingly, the injured State is entitled to reparation.¹⁰⁹

¹⁰³ SCHNEIDER, 170-174; MPEPIL, *Liability for Environmental Damage*.

¹⁰⁴ SHAW, 887, 888.

¹⁰⁵ Compromis, §§25, 26.

¹⁰⁶ DIEDERIKS-VERSCHOOR, 14.

¹⁰⁷ Compromis, §3.

¹⁰⁸ OPPENHEIM, 291.

¹⁰⁹ Leigh, 129, 143.

URA caused severe damage to SPIDR's environment during the gravity tractoring. It is due to its conduct that Syd-1's impact moved towards the SPIDR coast of the Cold Ocean and resulted in damages to Drogum.¹¹⁰

Consequently, URA is responsible for the damage to property as well as for the loss of lives in Drogum.

D. URA cannot claim that the wrongfulness of its action is precluded

At this point, the Applicant submits that a claim of URA precluding the wrongfulness of its act based on the defense of necessity must be dismissed. The prerequisites for invoking necessity are determined in Article 25 ARSIWA. Said Article states that “[n]ecessity may not be invoked by a State as a ground for precluding the wrongfulness of an act not in conformity with an international obligation of that State unless the act: (a) is the only way for the State to safeguard an essential interest against a grave and imminent peril; and (b) does not seriously impair an essential interest of the State or States towards which the obligation exists, or of the international community as a whole.”¹¹¹ The conditions for the plea of necessity are considered of customary nature, as reiterated in international jurisprudence.¹¹² Necessity is accepted only on a strictly exceptional basis, only in case there is an irreconcilable conflict between an essential interest and an international obligation of a State.¹¹³

¹¹⁰ Compromis, §26.

¹¹¹ Article 25, ARSIWA.

¹¹² Russian Indemnity; Société Commerciale; Gabčíkovo-Nagymaros (Judgment).

¹¹³ ARSIWA Commentaries, 80.

Arguments invoking Article 25 are discarded if there were other means available, even if those options cost more or require the State to do more to achieve its goal, or if cooperation with international organizations or other States is needed.¹¹⁴

In the present case, URA cannot invoke necessity. In August 2024, URA used TYRUS to speed up Syd-1, in order to ensure that the asteroid would miss the 2028 keyhole.¹¹⁵ Firstly, there was another possible manner of addressing the Syd-1 threat, since a gravity tractor can equally slow down an NEO “to achieve the same result- no collision” even if that would temporarily include a portion of URA territory.¹¹⁶ Moreover, several dozen human lives were lost and damages to property were sustained to Dropgum. Therefore, the conditions for necessity are not met, making a potential argument on behalf of URA void.

¹¹⁴ ARSIWA Commentaries, 83; BROWNLIE, 311; Heathcote, 493.

¹¹⁵ Compromis, §19.

¹¹⁶ Compromis, footnote 1, §21.

II. URA IS LIABLE UNDER INTERNATIONAL LAW FOR THE LOSS OF OR DAMAGE TO THE FIRST KNUD-1 SPACECRAFT, AND THE LOSS OF THE KNUD-2 HARVESTING OPERATION ON FLOYD-4

SPIDR submits that URA is liable under the LIAB and the OST for the damage to KNUD-1, as well as for the loss of the KNUD-2 harvesting operation on Floyd-4. Additionally, it is SPIDR's submission that URA is also *responsible* for said losses or damages under the provisions of the OST.

A. URA is liable for the loss of or damage to the first KNUD-1 spacecraft

1. URA is liable under Article III LIAB

According to Article III LIAB, "in the event of damage being caused elsewhere than on the surface of the Earth to a space object [...] of a launching State by a space object of another launching State, the latter shall be liable only if the damage is due to its fault [...]." It is the submission of the Applicant that URA is liable under Article III, since its requirements are fulfilled.

a) The damage to KNUD-1 is covered under the LIAB

As demonstrated above, the term "damage" means, *inter alia*, loss of or damage to property of States.¹¹⁷ This damage is covered regardless of whether it is direct or indirect.¹¹⁸

In the present case, the damage caused to KNUD-1 is direct. KNUD-1 was knocked over in the process of TYRUS' re-launch and lost all of its communications.

¹¹⁷ See above, I A 1.

¹¹⁸ Sinha, 4, 5; Houston Lay/Taubenfeld, 252. 259; See above, I A 2.

b) The damage was “caused by” TYRUS

The damage to KNUD-1 resulted from TYRUS’ re-launch. It must be noted that 1) prior to TYRUS’ re-launch from Floyd-4 KNUD-1’s scientific instruments were in perfect condition and functioned properly¹¹⁹ 2) KNUD-1 was knocked over in the process of TYRUS’ re-launch and 3) KNUD-1’s antenna was oriented down toward the surface of the asteroid only after the TYRUS re-launch. This rendered KNUD-1 uncontrollable and resulted in the loss of all its communications.¹²⁰ It follows that the damage to KNUD-1 was indeed caused by TYRUS.

c) URA is at fault

As far as fault under Article III LIAB is concerned, fault is considered as intent or negligence.¹²¹ Negligence exists when the launching State has not shown the appropriate amount of care or “observant attention”, *id est*, a standard of reasonable diligence exercised by a government in attempting to prevent the occurrence of harm.¹²² The standard for negligence is due diligence.¹²³ Due diligence is an obligation which encompasses not only the adoption of appropriate rules and measures, but also a certain level of caution in their enforcement to safeguard the rights of others.¹²⁴ The due

¹¹⁹ Compromis, §9.

¹²⁰ Clarification 19.

¹²¹ MPEPIL, *Fault*, 2007; Mazzeschi, 16.

¹²² Diplomatic and Consular Staff (Judgment) 3; BLACK’S 4th edition; Mejía-Kaiser, 274.

¹²³ Blomeyer-Bartenstein, 141.

¹²⁴ Pulp Mills, 69; Barnidge, 81.

diligence standard is measured *ad hoc*.¹²⁵ This means that in outer space activities, which are considered to be ultra-hazardous, a high level of diligence is demanded.¹²⁶

URA has shown negligence for failing to present due care and attention during its re-launch operation on Floyd-4. This duty of due care required from URA to assess the already known circumstances, namely the complicated topography, the existence of KNUD-1 on the preferred attachment site, as well as the difficulties TYRUS faced during landing. Therefore, it should have shown extra caution when re-launching TYRUS. However, it failed to do so. The lack of this attention is indicative of URA's negligent behavior which establishes its fault.

Even if it is held by this Court that fault constitutes any act or omission which violates an obligation,¹²⁷ URA is at fault for breaching its obligations under Article IX OST. URA violated the principle of due regard to the corresponding interests of all States as well as its duty to undertake appropriate consultations, as shown below.¹²⁸

2. URA is liable under Article VII OST

Even in the case it is held by this Court that URA is not at fault, it must still be held liable under Article VII OST. This Article is applicable since according to Article 23 of the Liability Convention, the provisions of this treaty shall not affect other international agreements between the States Parties. In fact, it must be read in conjunction with Article 30 para. 2 of the VCLT, which states that, when a treaty specifies that it is subject to an

¹²⁵ Advisory Opinion 2011 ITLOS, 43; Alabama Claims, 125.

¹²⁶ Soucek, 342; FAURE/YING, 328; BUNKER, 74; LACHS, 115; VIKARI, 278; WASSENBERGH, 92; Marchisio, 176.

¹²⁷ CHENG GENERAL PRINCIPLES, 225; Accioly, 369, 370 (1959); Russian Indemnity.

¹²⁸ See below, II A 3.

earlier or later treaty, the provisions of that other treaty prevail.¹²⁹ Therefore, Article VII OST, which prescribes, *inter alia*, that each State Party which launches an object into outer space and from whose territory or facility an object is launched, is internationally liable for damage to another State Party by such object in outer space applies. Given that only the prerequisites of damage and causal link are required for this article to be applied, Article VII incorporates the objective nature of international liability and does not require the existence of fault (strict liability).¹³⁰ Since the aforementioned prerequisites are met, URA is liable for the damage to KNUD-1 even if it is not at fault.

3. URA is responsible under Article VI OST and the general rules of State responsibility

It has already been stated that a State bears international responsibility for the violation of a primary rule of international law which is attributable to it.¹³¹ Once such breach is established, secondary rules on State Responsibility are drawn into effect. In the present case, a violation of primary rules has taken place on behalf of URA resulting to the damages to KNUD-1 spacecraft; therefore, Article VI OST, as well as the ARSIWA, are applicable.

a) URA violated Article I OST

According to the first sentence of Article I OST, “[t]he exploration and use of outer space [...] shall be carried out for the benefit and in the interests of all countries.” However, this freedom is limited by the OST itself; any activity is allowed in space as

¹²⁹ Article 30, VCLT; Bonin, 2.

¹³⁰ MPEPIL, *Outer Space, Liability for Damage*; Cheng, *Liability*, 115, 117; BROWNLIE, 423; VERSHOOR/KOPAL, 37; von der Dunk, *Responsibility*, 363, 364, 365; Kerrest/Smith I, 121, 132; Pfeifer, 221;

¹³¹ See above, I B 1.

long as it is carried out for the benefit and interests of mankind.¹³² States are prohibited from disregarding or harming the interests of any other State when conducting space activities.¹³³

In the case at hand, URA acted against the benefit and interests of SPIDR by damaging the KNUD-1 spacecraft. When TYRUS knocked KNUD-1 over and caused the loss of all its communications, it also rendered KNUD-1 uncontrollable.¹³⁴ Therefore, KNUD-1 could not resume its operation nor be directed from Earth, essentially becoming a piece of space debris.¹³⁵ It is clear that the activity of TYRUS hampered the interests of SPIDR served by the KNUD-1 mission. Furthermore, URA also acted against the interests of the international community as a whole by increasing the number of space debris in outer space, and by depriving the scientific community of the further information derived from KNUD-1's scientific research on the asteroid.¹³⁶

b) URA violated Article IX OST

(1) URA did not act with due regard to the corresponding interests of SPIDR

Under the first sentence of Article IX, “in the exploration and use of outer space [...] States Parties to the Treaty [...] shall conduct all their activities in outer space with due regard to the corresponding interests of all other States Parties [...].” The obligation which, therefore, derives from the wording of this Article is that of respecting other States' interests when conducting space activities.

¹³² Jakhu, 41; Marcoff, 339.

¹³³ Paxson, 494; LEE Mining, 195.

¹³⁴ Clarification 12.

¹³⁵ ILA International Instrument Protection of the Environment from Damage Caused by Space Debris, 305-325; Space Debris Mitigation Guidelines; IAA Position Paper on Orbital Debris, 3.

¹³⁶ Compromis, §9.

The principle of due regard is understood as an obligation to take into account, both prior to planned and during ongoing operations, the legal rights of other States.¹³⁷ Non-interference with activities of other States is a general rule of international law, applied by this Court in the 1974 *Fisheries Jurisdiction* case.¹³⁸ According to that ruling, a State has to take into consideration the legitimate interests of other States when it exercises its freedom of action and conduct itself with due regard to the other States' rights. The failure of a State to demonstrate due regard to the rights of other States may result in the harmful interference with other States' space activities.¹³⁹ Accordingly, States should avoid taking any measures aimed at hampering the space activities of other States.¹⁴⁰

In the case at hand, URA did not demonstrate due regard when re-launching TYRUS. URA attached TYRUS on the same area of the asteroid as KNUD-1, despite SPIDR's warnings about safety risks involved in attaching a second spacecraft on the surface of Floyd-4.¹⁴¹ URA's failure to show due regard is also proven by the damage to KNUD-1. Therefore, URA failed to show the required due regard, and thus violated Article IX OST.

(2) URA did not undertake consultations regarding the re-launch of TYRUS

The third sentence of Article IX stipulates that “[i]f a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, [...], would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space, [...], it shall undertake

¹³⁷ Draft Articles on Transboundary Harm; MPEPIL, *Due Diligence*; BLACK'S 4th edition, 590; Dictionnaire, 770.

¹³⁸ *Fisheries Jurisdiction* 1974, 3.

¹³⁹ Mineiro, 4.

¹⁴⁰ Marchisio, 175; Cypser, 324.

¹⁴¹ Compromis, §11.

appropriate international consultations before proceeding with any such activity or experiment.” For this provision to be applicable, two conditions must be met: First, there must be a planned activity or experiment in outer space. Second, there must be reason to believe that the activity or experiment would cause potentially harmful interference with activities of other States Parties in the peaceful exploration and use of outer space.¹⁴²

URA was under an obligation to undertake consultations before the re-launch of TYRUS from Floyd-4 since all of the above conditions are fulfilled. URA had indeed planned an activity in outer space; that is, TYRUS’ re-launch from Floyd-4 to Syd-1.¹⁴³ Moreover, taking into account TYRUS’ problematic attachment to the asteroid, the alterations on the surface of Floyd-4, and KNUD-1’s presence on the same attachment spot it was to be expected that TYRUS’ re-launch could cause potentially harmful interference with KNUD-1. Since all conditions are fulfilled, it is clear that URA should have requested consultations before re-launching TYRUS as well.

B. URA is liable for the loss of the KNUD-2 harvesting operation on Floyd-4

1. URA hampered SPIDR’s harvesting operation on Floyd-4

a) SPIDR had the legal right to harvest Floyd-4

(1) The harvesting of the resources of celestial bodies is lawful

Article I(2) OST states, *inter alia*, that celestial bodies shall be free for use by all States.¹⁴⁴ The term “use” describes both the economic and non-economic use of celestial bodies. Thus, the use of outer space for economic ends includes exploitation of the

¹⁴² Hacket, 109.

¹⁴³ Compromis, §18.

¹⁴⁴ Article I, OST.

celestial bodies for profit.¹⁴⁵ In addition, the “common interest” principle of Article I(1) OST should be interpreted in terms of economic benefits resulting from the exploitation of outer space.¹⁴⁶

(2) Property rights exist on the harvested natural resources of celestial bodies

Harvesting natural resources of celestial bodies would not be possible without the granting of property rights on the resources extracted. The non-appropriation principle of Article II OST is unclear on whether the ban of national appropriation applies only to the area of the celestial bodies or also to their natural resources. As distinguished scholars have stated,¹⁴⁷ property rights exist on the extracted mineral resources.¹⁴⁸ Besides, Article II establishes said principle against a *territorial* concept.¹⁴⁹ Extraction of minerals is compatible with Article II OST¹⁵⁰ as the territorial nature of the celestial bodies is not threatened. Additionally, the appropriation of natural resources is considered as part of the object and purpose of this Treaty, namely the “free use” of outer space.¹⁵¹ The implementation of this purpose leads to the conclusion that property rights must exceptionally be granted on the resources extracted.¹⁵² Such a conclusion is reinforced through interpretation based on the *effet utile*, which takes into account the treaty’s object and purpose together with good faith to ensure the effectiveness of the terms of the

¹⁴⁵ Hobe I, 35; Tan, 161; Böckstiegel/ Benkö, 282; VAN TRAA-ENGELMANN, COMMERCIAL, 20; Rosenfield, 73-77.

¹⁴⁶ BENKÖ/ GRAAFF/ REIJNEN, 74; OGUNBANWO, 214.

¹⁴⁷ Baca, 1069; J. Benson, 46; Dasch/Smith/Pierce, 174.

¹⁴⁸ White, 83; TRONCHETTI, 214; Gal, 47; Lee Property Rights, 409, 413; CHRISTOL, THE MODERN INTERNATIONAL LAW, 262.

¹⁴⁹ Cheng Extra-Terrestrial, 132, 142; White, 13.

¹⁵⁰ Goedhuis, 219.

¹⁵¹ *Ibid*; TRONCHETTI, 31.

¹⁵² Baca, 1041, 1069; J. Benson, 46; Dasch/ Smith/ Pierce, 174; White, 83.

treaty.¹⁵³ Thus, since the right to “free use” could not be exercised without property rights,¹⁵⁴ national property rights do exist over natural resources of the celestial bodies.

b) URA ignored SPIDR’s priority rights to exploit Floyd-4

There can be no commercialization in outer space without the acceptance of the existence of priority rights in commercial exploitation. Regarding the exploitation of mineral resources, priority is justified due to their limited amount and the limited access to them. In addition, the principle “first come, first served” applies to activities of commercial nature in space, once a space object occupies a location.¹⁵⁵ A precedent already exists in international law, with regard to the geostationary orbit. More specifically, the ITU allocates orbital slots in the geostationary orbit on a “first come” basis.¹⁵⁶ The reason is that the GEO constitutes a natural resource that is limited, as the ITU has stated.¹⁵⁷ It follows that, since it is impossible for all States so interested to simultaneously station their satellites in the GEO, only a certain number may be allowed at a time. The same applies to any area in space that is similarly limited in access.¹⁵⁸

The aforementioned assertions apply in the present case. The attachment site of Floyd-4 was limited in area due to its complicated topography.¹⁵⁹ Additionally, KNUD-1 was the first spacecraft to land on Floyd-4. This meant that KNUD-1 would occupy a large part of the preferable attachment site. As such, any other spacecraft landing on the

¹⁵³ VILLIGER, 428; Greek/ Turkish Populations; Lighthouses case; Gabčíkovo-Nagymaros (Judgment), O’CONNELL, 253; Chorzów Factory

¹⁵⁴ Darwin, 278.

¹⁵⁵ SGROSSO, 63; White, 83.

¹⁵⁶ Lambright/Ya Ni, 106; Frieden, 127.

¹⁵⁷ ITU Constitution, art. 44.

¹⁵⁸ Cohen/ Steen/Hamilton, 3.

¹⁵⁹ Compromis, §9.

same site would unavoidably find itself in alarming proximity to KNUD-1, compromising both operations. SPIDR's KNUD missions had priority on the asteroid and SPIDR was the only State competent to judge the safety risks involved in attaching a second spacecraft on the asteroid. SPIDR had indicated its priority to URA in time; nonetheless, URA ignored it. For these reasons, SPIDR's priority in harvesting Floyd-4, as well as URA's failure to respect it, should be recognized.

Even if it is claimed by the Respondent that it had the right to 'prior harvesting' in accordance with Article 11(5) MA,¹⁶⁰ it is the Applicant's submission that the MA has not attained widespread support from States as most are opposed to the "common heritage of mankind" concept. This was also the case concerning Part XI of the 1982 UNCLOS which was after all amended by the 1994 Agreement.¹⁶¹

In the present case, SPIDR had every right to prior harvesting of the resources on Floyd-4. However, its activities were unlawfully hindered by URA, which not only demonstrated a disregard for SPIDR's priority, but also prevented SPIDR from exercising its harvesting rights on the asteroid. Due to surface alterations caused by TYRUS on Floyd-4, KNUD-2 was severely damaged during the landing phase. Consequently, KNUD-2 was not able to operate at its full harvesting capacity and had to depart from the asteroid earlier than planned.¹⁶² Hence, KNUD-2 only managed to deliver a fraction of the resources it was supposed to collect.¹⁶³ Thus, SPIDR suffered huge consequential damage, in the form of loss of profits from the resources it was unable to gather.

¹⁶⁰ Article 11 (5), MA.

¹⁶¹ UNCLOS; Klein, 320.

¹⁶² Compromis, 22.

¹⁶³ Compromis, 23.

Therefore URA prevented SPIDR from fully exercising its lawful rights of exploitation under Article I(2) OST.

2. URA is liable under Article III LIAB

a) The damage to KNUD-2 is covered under the LIAB

The damage to the instruments and solar panels of KNUD-2 was caused indirectly by TYRUS. Specifically, the damage was caused by the adverse changes introduced by TYRUS on the surface of Floyd-4.

b) The damage was caused by TYRUS

There is a proximate causal connection between the actions of TYRUS and the damage to KNUD-2. Specifically, TYRUS managed to attach on the regolith of Floyd-4 only after irreversibly altering the NEO's surface.¹⁶⁴ It was TYRUS' impact on the surface of Floyd-4 that caused irreparable damage to the instruments and solar panels of KNUD-2, since the landing of the latter on the altered surface was problematic due to said alteration.

c) Loss of profits constitutes damage under the LIAB

The damage caused to the KNUD-2 spacecraft led to the loss of the harvesting operation on Floyd-4. Loss of profits is covered under indirect damage,¹⁶⁵ when it is shown that the profit would have been expected in the ordinary cause of events.¹⁶⁶

In the present case, KNUD-2's scientific instruments were damaged irretrievably and its solar panels could operate only at 30% of their intended capacity.¹⁶⁷ Hence, KNUD-2

¹⁶⁴ Compromis, § 22.

¹⁶⁵ Kerrest/Smith I, 141. Carpanelli/Cohen, 10; Amco Asia; LIAMCO;

¹⁶⁶ Chorzów Factory; O'CONNELL, 987.

managed to deliver only 10% of the resources it was supposed to collect and had to depart just four months after docking.¹⁶⁸ The fact that KNUD-2 had already begun the extraction of a fraction of the resources (10%) is indicative of the future resources (90%) it would have collected had it not been damaged. Consequently, because of the damage to KNUD-2, SPIDR suffered huge economic damage in the form of loss of profits from the resources it was unable to gather.

d) URA is at fault

As demonstrated above, fault is considered as intent or negligence.¹⁶⁹ URA has shown negligence for failing to present due care and attention during its landing operation on Floyd-4. Specifically, it is stated in the agreed facts that TYRUS required several unsuccessful attempts in order to attach on Floyd-4, and altered the surface in the process. Although it is clarified that URA was not aware of these alterations until KNUD-2's arrival it should have become aware of the conditions of TYRUS' landing, and informed SPIDR accordingly, bearing in mind the upcoming KNUD-2 mission.¹⁷⁰ This negligent behavior of URA establishes its fault.

Even if it is held that fault constitutes any act or omission that violates an obligation,¹⁷¹ URA is still at fault for the damage to KNUD-2 since it has breached its obligations under Articles IX and XI OST as demonstrated below.¹⁷²

¹⁶⁷ Compromis, §22.

¹⁶⁸ Compromis, §23.

¹⁶⁹ *Supra*, note 121.

¹⁷⁰ Clarification 19; Report of the ILC 53rd session; Draft Articles on Transboundary Harm; Crawford/Olleson, 460.

¹⁷¹ *Supra*, note 127.

¹⁷² See below, II B 4.

3. URA is liable under Article VII OST

As already shown above, URA is liable for the damages to both KNUD spacecraft even if it is not at fault.¹⁷³

4. URA is responsible under Article VI OST and the general rules of State responsibility

a) URA violated Article I OST¹⁷⁴

By introducing adverse changes on the surface of Floyd-4, URA hampered SPIDR's interests of harvesting Floyd-4's resources since KNUD-2 was irrecoverably damaged.¹⁷⁵ Therefore, by acting against the interests of SPIDR, URA violated Article I OST.

b) URA violated its duty to undertake international consultations under Article IX OST

URA was under the duty of undertaking international consultations before the launch of TYRUS since the conditions mentioned above are met.¹⁷⁶ Firstly, URA had planned the launching of TYRUS to Floyd-4.¹⁷⁷ Secondly, URA had serious reason to believe that its landing might potentially have a harmful interference with SPIDR's mission as SPIDR had already informed the international community of the complicated topography of Floyd-4.¹⁷⁸ Moreover, URA had been promptly informed of the safety risks involved in attaching a second spacecraft on the asteroid. Potential alteration of the surface of the asteroid during TYRUS' attachment would possibly be harmful to any future attachment

¹⁷³ See above, II A 2.

¹⁷⁴ See above, II A 3a.

¹⁷⁵ Compromis, §22.

¹⁷⁶ See above, II A 3 b 2.

¹⁷⁷ Compromis, §7.

¹⁷⁸ Compromis, §9.

on the same preferable area. For these reasons, URA was under the obligation to undertake international consultations before launching TYRUS.

c) URA violated its duty to inform under Article XI OST

According to Article XI OST, States Parties to the Treaty agree to inform the Secretary-General of the United Nations as well as the public and the scientific community, to the greatest extent feasible and practicable, *inter alia*, of the results of such activities. The provisions of this Article incorporate the general concept of international cooperation in space activities.¹⁷⁹

In the present case, URA was under an obligation to inform SPIDR of the results of TYRUS' landing on Floyd-4, namely the alterations of the asteroid's surface. The fact that URA was not aware of the alteration until KNUD-2's arrival, is of no importance since it should have taken measures to become informed.¹⁸⁰ However, URA breached Article XI OST by failing to inform the international community and specifically SPIDR whose interests were directly affected, of said results.

C. Even if URA had the right to free access on Floyd-4 under Article I OST, it abused this right

Last but not least, even if it is accepted by the Court that URA had the right to access Floyd-4, regardless of SPIDR's priority rights, the Applicant submits that URA is responsible for abusing its right to free access under Article I of the OST.¹⁸¹ The concept of "abuse of rights" provides that States are responsible for their acts, which are not

¹⁷⁹ Mayence/Reuter, 191

¹⁸⁰ See above, II A 1 c.

¹⁸¹ Article I, OST; Jakhu, 31, 44. (2006).

unlawful in the sense of being prohibited, however cause injury to other states.¹⁸² The prohibition of abuse of rights is considered a general principle of law¹⁸³ and has been widely accepted in international law¹⁸⁴ as the PCIJ has ruled in the case concerning *Certain German Interests in Polish Upper Silesia* case.¹⁸⁵ In the aforementioned case, the Court ruled that a misuse of the right of Germany to dispose of its property would entail the character of a breach of the Treaty.

In the present case, URA misused its right of free access under Article I OST by introducing adverse changes¹⁸⁶ on Floyd-4 and by depriving SPIDR of its right to landing KNUD-2 safely and on the preferred attachment spot. The Respondent exercised this right in a way that prevented the Applicant from exercising its own respective right. Therefore, URA abused its right.

¹⁸² LAUTERPACHT, 286.

¹⁸³ Byers, 390, 391.

¹⁸⁴ Fisheries 1951; Free Zones; Shrimp WTO.

¹⁸⁵ *Certain German Interests*.

¹⁸⁶ Article VII, MA.

SUBMISSIONS TO THE COURT

For the foregoing reasons, the government of the Sovereign Peoples Independent Democratic Republic, Applicant, respectfully requests the Court to adjudge and declare that:

- (i) URA is liable for damages under international law to SPIDR for changing the orbit of Syd-1, which resulted in the loss of life and damage to Dropgum; and
- (ii) URA is liable under international law for the loss of or damage to the first KNUD-1 spacecraft, and the loss of the KNUD-2 harvesting operation on Floyd-4;
and to dismiss all claims to the contrary.

Respectfully submitted on behalf of the Applicant,
Agents for the Applicant.