THE 2015 MANFRED LACHS SPACE LAW MOOT COURT COMPETITION

TEAM No. 2

IN THE INTERNATIONAL COURT OF JUSTICE
AT THE
PEACE PALACE, THE HAGUE

Case Concerning Planetary Defense

THE SOVEREIGN PEOPLES INDEPENDENT DEMOCRATIC REPUBLIC (SPIDR)

(*Applicant*)

V.

THE UNITED REPUBLIC OF ADVENTURA (URA)

(*Respondent*)

ON SUBMISSION TO THE INTERNATIONAL COURT OF JUSTICE

MEMORIAL FOR RESPONDENT

THE UNITED REPUBLIC OF ADVENTURA

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QUESTIONS PRESENTED

1. Whether URA is liable under international law for damages to SPIDR caused by Syd-1.

2. Whether URA is liable under international law for any loss of or damage to the two KNUD spacecraft.

STATEMENT OF FACTS

1. The United Republic of Adventura (URA) and the Sovereign Peoples Independent Democratic Republic (SPIDR) are separated by the Cold Ocean, 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.[1]

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).[2]

3. URA is the lead state of the URA Consortium (URAC) which was formed to address and prevent actual collision threats posed by individual NEOs. URAC focuses on the development of "gravity tractors"[3] to deflect NEOs such that they do not pass through any threatening "keyholes.[4] URAC also licenses the utilization of NEO resources. All of the members of the consortium have signed or ratified the Moon Agreement.[5]

4. FUSA was able to develop and launch an unmanned space station known as the Titanium

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[1] Special Agreement Between the United Republic of Adventura and the Sovereign Peoples Independent Democratic Republic ¶ 1. [hereinafter *Compromis*].
[2] *Id.* ¶ 2.
[3] *Id.* ¶ 3. A gravity tractor works on the basis of two-way gravitational attraction between the NEO and the tractor, such that placing the tractor behind the NEO would marginally "speed it up" within its orbit; whereas placing the tractor behind the NEO would marginally "slow it down" likewise. By speeding it up the NEO would pass a future intersection with the orbit of the Earth well ahead of Earth passing that intersection, hence avoiding a collision; whereas slowing it down leads it to pass that intersection sufficiently much later than the Earth to achieve the same net result—no collision. *Id.* n.1.
[4] A keyhole is a limited three-dimensional area in outer space of such a nature that if the orbit of a NEO misses a keyhole ("keyhole deflection") ensures it will *not* collide with the Earth. *Id.* n.2.
[5] *Id.* ¶ 3.

Autonomous Save-the-Earth Industrial Depot (TASEROID). TASEROID serves as a depot for FUSA space activities and stores and then sells natural resources brought back from NEO missions to other space-faring nations and commercial entities.[6]

5. With the development and operation of TASEROID, FUSA also developed and launched the Twelve Yard Resource Utilization System (TYRUS). TYRUS is a robotic space system used to be launched to NEOs in order to harvest valuable mineral resources and deliver them to TASEROID.[7]

6. Meanwhile, the SPIDR Space Agency had also developed its own manned space station.[8] In 2003, the SPIDR Space Agency realized that Floyd-4, a roughly pig-shaped asteroid of some 600 by 150 by 200 meters in size, would make a near-Earth pass in June 2011.[9] The SPIDR space agency announced that its calculations undertaken in April 2010 demonstrated that Floyd-4's trajectory presented a risk of the NEO colliding with the Earth sometime in the future.[10] The SPIDR Space Agency also announced that it had developed the Kosmic Near-Earth Utility Developer (KNUD-1) in order to visit the asteroid and if possible, attach itself to the surface as part of its own NEO threat assessment and mitigation program.[11] KNUD-1 was launched in November 2010.[12]

7. Over the spring of 2011, FUSA singled out Floyd-4 as a target for its first NEO mission. Floyd-4 was to make a second nearby pass in February 2024 giving rise to a launch

[6] *Id.* ¶ 4.
[7] *Id.* ¶ 5.
[8] *Id.* ¶ 6.
[9] *Id.*
[10] *Id.*
[11] *Id.*
[12] *Id.*

window of less than two months in the course of late 2023.[13] FUSA examined Floyd-4 with telemetry using ground based equipment and lunar-orbiting spacecraft, and concluded that it likely was a carbonaceous chondrite containing considerable deposits of water and hydrocarbons.[14] In May 2011, FUSA announced that it had established a telepresence on Floyd-4 and would establish a physical presence on the asteroid by sending the first TYRUS mission to the NEO.[15]

8. In protest, SPIDR issued a statement on June 1, 2010, stating SPIDR had "priority" rights to any use or exploitation of Floyd-4, that 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.[16] The SPIDR Space Agency also declared that it had authorized the development of a much larger spacecraft, KNUD-2, to visit Floyd-4 during its next pass close to Earth during February 2012 in order to harvest the resources of the NEO and deliver any resources to the SPIDR space station.[17]

9. Regardless, KNUD-1 arrived at Floyd-4 as scheduled, and was able to attach itself onto Floyd-4's regolith in June 2011.[18] KNUD-1 relayed much information back to the scientific community and confirmed FUSA's discovery that was a carbonaceous chondrite containing water and hydrocarbons.[19]

10. URAC decided to commercially exploit the resources of Floyd-4 to provide a funding

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[13] *Id.* ¶ 7.
[14] *Id.*
[15] *Id.*
[16] *Id.* ¶ 8.
[17] *Id.*
[18] *Id.* ¶ 9.
[19] *Id.*

source for further NEO planetary defense activities.[20] URAC developed a economic-incentive system in which URAC would license private entities to harvest the resources of Floyd-4 in exchange for developed technologies and royalty payments.[21] The URAC declared that there was moratorium of extraction on the extraction of the resources on Floyd-4 and other NEOs, and that only states party to the Moon Agreement were eligible for licenses.[22]

11. URA and SPIDR offered periodic warnings to each other not interfere with their respective missions.[23] During UNCOPUOS meetings, both URA and SPIDR asserted they had the right under international law to conduct their respective missions on Floyd-4.[24]

12. FUSA launched TYRUS on October 22, 2023.[25] TYRUS reached Floyd-4 on February 6, 2024, and attempted to attach itself to the irregular surface.[26] Though it modified the surface, TYRUS was able to attach itself to Floyd-4.[27]

13. SPIDR attempted to launch KNUD-2 in order to overtake the mission of TYRUS, but was unable to due to potentially risky launch anomalies.[28] Therefore, KNUD-2 was launched on December 3, 2023.[29]

14. Without any consultations with FUSA, URAC, or UNCOPUOS, SPIDR announced

[20] *Id.* ¶ 10.
[21] *Id.*
[22] *Id.*
[23] *Id.* ¶ 11.
[24] *Id.*
[25] *Id.* ¶ 12.
[26] *Id.*
[27] *Id.*
[28] *Id.* ¶ 13.
[29] *Id.*

KNUD-2 was scheduled to arrive at Floyd-4 on March 7, 2024.[30] SPIDR thus demanded that FUSA remove TYRUS from Floyd-4 before that date so KNUD-2 could land on its preferred attachment area.[31] Neither URA nor URAC responded to the demand.[32]

15. Meanwhile, while TYRUS examined Floyd-4, new developments took place with respect to an asteroid named Syd-1.[33] Syd-1 was a diamond-shaped NEO about 100 meters in size and believed to be a carbonaceous chondrite.[34]

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 October 27, 2031, because of a keyhole in its trajectory, which it was scheduled to pass on October 27, 2028.[35] However, on February 17, 2024, after following analysis of new tracking data, FUSA estimated of a 1 in 80 chance of Syd-1 encountering the keyhole and subsequently impacting the Earth on October 27, 2031.[36]

17. 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.[37]

18. FUSA determined that within six months, Syd-1 would enter a window whereby it would be in a position where the TYRUS could be relaunched from Floyd-4 and rendezvous

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[30] *Id.* ¶ 14.
[31] *Id.*
[32] *Id.*
[33] *Id.* ¶ 15.
[34] *Id.*
[35] *Id.* ¶ 16.
[36] *Id.*
[37] *Id.* The "uncertainty ellipse" is the area around a central virtual impact point where, due to the margins of error in the calculations of orbital trajectories, there is *a* possibility of impact, with statistically speaking the most likely actual impact being in the heart of the ellipse—the central virtual impact point. *Id.* n.4.

with Syd-1.[38] TYRUS could then be utilized as a gravity tractor on Syd-1 in order to change its velocity sufficiently for the risk of collision with the Earth to be eradicated.[39]

19. On February 26, 2024, after considering all alternative options for addressing the threat posed by Syd-1, FUSA announced that URAC would relaunch TYRUS from Floyd-4, and confirm whether Syd-1 was on a trajectory for the keyhole.[40]

20. During relaunch, TYRUS knocked over KNUD-1, thus impairing KNUD-1's communication capabilities.[41] When TYRUS reached Syd-1 on August 19, 2024, it was determined that Syd-1 was indeed heading towards the 2028 keyhole and that and that the nominal impact point of Syd-1 in 2031 would lie in the Cold Ocean between URA and SPIDR.[42]

21. On August 22, FUSA decided to position TYRUS in front of the NEO to speed it up in order to divert Syd-1 away from the 2028 keyhole.[43] Within three more days, FUSA announced it had moved itself in front of the asteroid and the process of increasing velocity had commenced.[44]

22. Following FUSA's announcement on August 22, the SPIDR Space Agency determined that the TYRUS mission would drag the asteroid across the surface of the Earth over a portion of SPIDR territory before it disappeared off the Earth altogether.[45] The SPIDR Space Agency also stated that if something went wrong with the TYRUS mission, the

[38] *Id.* ¶ 17.
[39] *Id.*
[40] *Id.* ¶ 18.
[41] *Id.* ¶ 19.
[42] *Id.*
[43] *Id.*
[44] *Id.*
[45] *Id.* ¶ 20.

chances of Syd-1 actually crashing into SPIDR territory would be larger.[46]

23. Therefore, SPIDR protested the TYRUS mission stating that FUSA's decision put SPIDR at greater risk.[47] SPIDR suggested that moving Syd-1 in the opposite direction, that is slowing it down, "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."[48]

24. Meanwhile, KNUD-2 had reached Floyd-4 on March 27, 2024, and found the preferred landing site available as TYRUS left to intercept Syd-1.[49] TYRUS had modified the surface during its eventual attachment, and KNUD-2 had difficulty landing.[50] In the process of attachment, KNUD-2 sustained damaged to several instruments and was consequently limited in its operations.[51] KNUD-2 was only able to return a small portion of the resources intended to be extracted from Floyd-4.[52]

25. Subsequently, SPIDR announced it held URA liable for the damage sustained KNUD-2.[53] URA responded by claiming that it had the right to prior harvesting in combination with its decision to redirect the TYRUS mission to eliminate the threat posed by Syd-1 for the benefit of SPIDR as well as the rest of mankind.[54]

26. Later, though the orbit was Syd-1 was altered, it was determined that after the keyhole event of 2028, the risk corridor for the 2031 encounter did not completely miss the Earth

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[46] *Id.*
[47] *Id.* ¶ 21.
[48] *Id.*
[49] *Id.* ¶ 22.
[50] *Id.*
[51] *Id.*
[52] *Id.* ¶ 23.
[53] *Id.* ¶ 24.
[54] *Id.*

but had moved towards the SPIDR coast of the Cold Ocean.[55]

27. In September of 2031, Syd-1 entered in the atmosphere and produced an airburst over the coastal village of Dropgum.[56] The airburst destroyed the town and took the lives of several dozen people.[57]

28. SPIDR has claimed URA is liable for changing the orbit of Syd-1 which resulted in loss of life and damage to Dropgum.[58] SPIDR also claims that URA is liable for damage to the KNUD-1 spacecraft as well as the loss of the KNUD-2 harvesting operation on Floyd-4.[59]

29. In response, URA claims it is not liable for damages to SPIDR caused by Syd-1.[60] URA also claims it is not liable for damage to the two KNUD-2 spacecraft.[61]

30. 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.[62]

31. SPIDR and URA have agreed to submit their dispute for binding resolution by the International Court of Justice. [63]

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[55] *Id.* ¶ 25.
[56] *Id.* ¶ 26.
[57] *Id.*
[58] *Id.* ¶ 28.
[59] *Id.*
[60] *Id.* ¶ 29.
[61] *Id.*
[62] *Id.*
[63] *Id.* ¶ 27.

SUMMARY OF ARGUMENT

URA is not liable for damages to SPIDR caused by Syd-1 under the Liability Convention or under general international law. Despite its allegations, SPIDR is unable to prove causation under the Liability Convention. In addition, the damage resulting from the airburst of Syd-1 is not within the purview of risk established by the Liability Convention due to three limiting factors. First, the text of the outer space agreements supports the idea that the context of the space treaties is limited to novel situations arising from human activity. Second, the intended scope of the Liability Convention is limited to risks introduced by human activity. Finally, international law limits the scope of the Liability Convention.

URA is not liable for damages to SPIDR caused by Syd-1 under general international law due to a lack of fault on behalf of URA. URA has a right under international law to take necessary actions to preserve itself and its population. URA acted in accord with necessity as URA did not seriously impair the interests of SPIDR, URA was legally justified in the use of gravity tractors, and URA's ultimate deflection was legally and scientifically appropriate. Furthermore, URA fulfilled its obligations under the Outer Space Treaty, and SPIDR is estopped from assigning liability to URA for damages caused by Syd-1.

URA is not liable for any damage to the KNUD-1 or KNUD-2 spacecraft. Under the Outer Space Treaty and general international law, URA is entitled to free access to celestial bodies and the inaccurate legal statements from URA and URAC do not affect the claims at bar in the present case. In addition, the Abuse of Rights Doctrine cannot be applied proscriptively to ban conduct, and prior use of an area does not provide an ongoing right to that location. The damages to KNUD-1 resulted from an emergency situation and not a violation of international law on the part of URA. SPIDR cannot prove that TYRUS modifying the surface caused the

damages to KNUD-2. Even if the Court finds causation, URA did not act wrongfully in modifying the surface, and thus cannot be held liable in a fault-based system.

ARGUMENT

I. URA is not liable for damages to SPIDR caused by Syd-1.

A. URA is not liable for damages caused by Syd-1 under the Liability Convention

According to the Liability Convention, "[a] launching state shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the Earth or to an aircraft in flight."[64] However, URA is not liable for damages to SPIDR caused by Syd-1 because SPIDR cannot meet the burden of proof to demonstrate causation. Furthermore, the damage resulting from the airburst of Syd-1 is not within the purview of risk established by the Liability Convention.

1. SPIDR cannot prove causation

Though the Liability Convention established a regime of strict liability in which fault need not be proved for damages within the scope of the Convention, causation of damages must still be proved. However, SPIDR cannot prove that URA's actions caused damage to Dropgum. Even when analyzing claims of damage using the Liability Convention, causation remains a factual question. In its most recent discussion of questions of fact, this Court has reaffirmed that "the burden of proof rests in principle on the party which alleges a fact."[65] Given this rule, SPIDR has the burden of proving URA's actions did in fact cause damage. It is stipulated between the parties that both URA and SPIDR were inside the "risk corridor of potential impact

[64] Convention on International Liability for Damage Caused by Space Objects art. II, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention].
[65] Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Croat. v. Serb.), 2015 I.C.J. 1, 65 (Feb. 3).

points," and therefore SPIDR was already at risk of impact.[66] This is analogous to the *Pulp Mills* case, in which the fact that an algae bloom was similar to the type of damage that would be expected in increasing nutrient levels in a river was found insufficient to prove causation given the preexisting risk of such a phenomenon.[67]

As a village on the Cold Ocean over which the potential impact points were centered, Dropgum was on the side of SPIDR closer to the center of the uncertainty ellipse. Using a gravity tractor to alter an asteroid's orbit results in risk being shifted east or west, rather than north or south.[68] As a result, the method of operation of gravity tractors and the geographical position of Dropgum imply it was one of the areas of SPIDR already at risk of an impact or airburst. A claim of increased risk to Dropgum fails to take into account the fact that small asteroids present the possibility of a devastating tsunami.[69] Scientific models indicate that an asteroid with a diameter of 100 meters has the potential to create a major tsunami several hundred kilometers from its impact point.[70] In the absence of clear proof that URA's action

[66] *Compromis* ¶ 16.
[67] Case Concerning Pulp Mills on the River Uruguay (Arg. v. Uru.), 2010 I.C.J. 1, 96-97 (Apr. 20).
[68] Alexis Madrigal, *Saving Earth from an Asteroid Will Take Diplomats Not Heroes*, WIRED (Dec. 16, 2009), http://www.wired.com/2009/12/saving-earth-from-an-asteroid/.
[69] J. Kunich, *Planetary Defense: The Legality of Global Survival*, 41 A.F. L. REV. 119, 124 (1997).
[70] For one specific scenario, a 100 meter diameter asteroid with a density of 3000 kg/m^3 and 45° angle of impact is predicted, if impacting 1000 meter deep water at 17 meters per second, to create a tsunami with an amplitude of just over a meter at 200 kilometers and about 2 feet at 400 kilometers. *See Earth Impacts Effects Program*, IMPERIAL COLL. LONDON, http://impact.ese.ic.ac.uk/ImpactEffects/ (last visited Mar. 8, 2015), *cited in* by L. F. Castillo Arganaras, *Natural Near Objects and The International Law of Outer Space*, 2008 INT'L INST. SPACE L. 283, 285. Note that amplitude gives the height of the deep water wave which is often several times lower than the run-up height created as the wave encounters the shore. SMS TSUNAMI WARNING, http://www.sms-tsunami-warning.com (last visited Mar. 3, 2015). The run up-effect poses a particular threat to many coastal population centers because of how the water is channeled by ports. *Id.*

caused damage to Dropgum, the burden of proof of factual causation cannot be met and URA must be exonerated from liability for the airburst of Syd-1.[71]

2. The damage resulting from the airburst of Syd-1 is not within the purview of risk established by the Liability Convention

Further, even if the Court finds that the probability of damage to SPIDR was increased due to URA's deflection efforts, it would still be inappropriate to apply the strict liability standard of the Liability Convention because the Convention was not designed to address pre-existing risks to the entire Earth. The Liability Convention stipulates that a state is "absolutely liable" for damages it causes to the ground, yet it has no provision for holding a state liable for only the percentage of risk shifted to an already at-risk country.[72] Holding URA liable for the entire damage in a case like the present would impose an inequitable burden on states taking action to protect the Earth.[73] Such a manifestly absurd and unreasonable application of the Liability Convention fails to account for its "object and purpose."[74] One space law scholar has gone so far as to say:

> The provisions of the Convention are, thus, limited in scope to liability cases for damages caused by a space object only. With regards to disaster management issues, this means that these provisions are only applicable if a satellite or another system used for disaster management purposes falls down on Earth and causes damages. As a consequence, all the others [sic] liability cases which may arise in connection with the use of space technologies for disaster management activities are not covered by the terms of the Convention.[75]

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[71] *See supra* note 67 and accompanying text.
[72] Liability Convention, *supra* note 64, art II.
[73] This Court has explicitly taken equity into account in previous cases. *See, e.g.*, North Sea Continental Shelf Cases (F.R.G. v. Den./F.R.G. v. Neth.), 1969 I.C.J. 4, 48-50 (Feb. 20).
[74] Vienna Convention on the Law of Treaties art. 31-2, May 23, 1969, 1155 U.N.T.S. 331 [hereinafter Vienna Convention].The Vienna Convention is generally accepted as summarizing customary international law and has been cited by this Court often. Maritime Dispute (Peru v. Chile), 2014 I.C.J. 1, 18-19 (Jan. 27).
[75] F. Tronchetti, *Space Treaties and Disaster Management*, 2008 INT'L INST. SPACE L. 673, 678-79.

This statement conflates the question of causation under the Liability Convention with the question of whether the Liability Convention is applicable at all. However, the scholar references in an exaggerated way the fact that the intended scope of the Liability Convention's strict liability regime encompassed novel risks introduced to the Earth by spaceflight. Damages that occur in the course of disaster prevention are not of this nature.

a) The text of the outer space agreements supports the idea that the context of the Liability Convention is limited to novel situations arising from human activity

"The intention, indeed the whole – 'teleological' – context of the Outer Space Treaty was to deal with activities of mankind and man's entry into outer space and to provide a legal context and framework for those."[76] This mindset is clearly reflected in the current text of the outer space agreements. The other major space treaties confirm that the risks of human space activity form the context and circumstances in which the Liability Convention was concluded.[77]

The Outer Space Treaty creates rules for space in the context of humans "launching" objects into space and provides a framework for assigning responsibilities and liabilities based on which state conducted the launching.[78] The Rescue Agreement creates a framework for the international community to give aid to these launching states and calls for return of a "space object" and its "component parts" belonging to the "launching authority."[79] The Registration Convention, a document drafted in close proximity with the Liability Convention, provides instructions regarding how an individual state is to notify others of its placement of a space

[76] Frans G. von der Dunk, *Defining Subject Matter Under Space Law: Near-Earth Objects Versus Space Objects*, 2008 INT'L INST. SPACE L. 293, 294-95.
[77] Vienna Convention, *supra* note 74, arts. 31, 32.
[78] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies art. VII, Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].
[79] Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space art. V, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119.

object in order to assign liability to risks introduced by such activity.[80] The text of the Liability Convention itself shows that it is similar in scope to the aforementioned space agreements. For example, the Convention shows its concern with risk introduced by human activity in its broad definition of space object as including "its component parts, its launch vehicle, and parts thereof."[81]

b) The intended scope of the Liability Convention is limited to risks introduced by human activity

Interpreting the scope of the Liability Convention as being tied to increased risks resulting from human activity receives confirmation upon examination of its *travaux préparatoires*:

> So far it seemed that no significant damage had been done to any State or person not directly associated with the launching; the risks would increase, however, as the number and size of the objects launched into outer space increased. It was primarily for the protection of the interests of the States and people who occupied the greater part of the land masses of the earth, but who had no substantial direct concern in space activities, that there was an urgent need for an affirmative and satisfactory liability agreement.[82]

Consequently, it can be said that "the intention of all delegations was quite clear: the intention was to refer to [space objects as] objects which had been introduced or were sought to be introduced into outer space by human agency."[83] As they sought to make sure the Convention

[80] Convention on Registration of Objects Launched into Outer Space, Jan. 14 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15.
[81] Liability Convention, *supra* note 64, art. I.
[82] Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Draft Agreement on Liability for Damage Caused by Objects Launched into Outer Space, U.N. Doc. A/AC.105/C.2/SR.92 (1968) [hereinafter U.N. Doc. SR.92].
[83] *Id.*

was broad enough to deal with all of the new risks of human spaceflight, several states voiced concern about damage originating from parts "detached from or torn from the space object."[84]

Because the point here is to cover all of the risks introduced by spaceflight, it would be an absurd construction of the Liability Convention to limit its scope to direct impacts of space objects. However, it is likewise absurd and unreasonable to expand its scope to apply to risks to the Earth not introduced by human activity, or to punish states that take action against such pre-existing risks. The application of strict liability to intervention against asteroids would in effect reward states for inaction, allowing them to reap the benefits of deflection if another state conducted it successfully, while reserving them an absolute right to fine the rescuing state upon failure. Such a situation is absurd and unreasonable, and recourse to the preparation documents shows that punishing attempts to mitigate natural disasters was outside the drafters' intention.[85]

Whether or not the damage results from the physical impact of a space object, the logic of the Liability Convention holds states liable for risks their space activities introduce to the Earth. Thus, a mission which brought a celestial body into Earth's orbit would be strictly liable for any damage resulting from the risk it had introduced and unable to exonerate itself even if there was no showing of fault or negligence. By the same logic, a mission which attempts to stop a celestial body that is already on a collision course with Earth is not within the scope of the Liability Convention if it does not increase the aggregate risk to Earth.

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[84] Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Argentina, Belgium, France: Working Paper, Definition of a Space Object, U.N. Doc. PUOS/C.2/70/WG.1/CRP.16 (1970).

[85] During the drafting of the Liability Convention, one delegate "urged the space Powers to ponder the words of Professor Lachs, a Judge of the International Court of Justice, who had stated that the jurists task in shaping the law of outer space involved more than the framing of technical treaty clauses and the analysis of documents" and instead was to "remove threats to survival." Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Draft Agreement on Liability for Damage Caused by Objects Launched into Outer Space, U.N. Doc. A/AC.105/C.2/SR.128 (1969).

Syd-1 was destined to strike Earth unless URA or another state took immediate action. If URA had chosen not to intercept Syd-1, damage would still have been inflicted upon the Earth's surface, possibly upon another populated area through means of direct impact or consequent natural disasters. The compromis provides no indication that the total risk to Earth was increased. Rather, it hints that the "risk corridor did not completely miss the Earth" and that the URA mission had partially shifted the risk corridor in a direction in which the possible path of the asteroid now included a greater area of empty space.[86] The fact that these improved odds did not ultimately result in Syd-1 missing the Earth does not change the fact that the mission, unlike the situations envisioned by the Liability Convention, decreased the risk to the Earth.[87]

c) International law limits the scope of the Liability Convention

Article III of the Outer Space Treaty affirms that broader international law applies to space, and the principles of international law help to provide context to the treaties and deal with gaps in their explicit provisions.[88] There is precedent for narrowly reading the scope of applicable treaties to limit conflict with established international law. In the Advisory Opinion on Nuclear Weapons, this Court has said, "[It] does not consider that the treaties in question could have intended to deprive a State of the exercise of its right of self-defence under international law because of its obligations to protect the environment."[89]

In the same manner, the space treaties remain in effect during emergencies, but should not be interpreted in such a way as to undermine the right of states to protect themselves. The present situation is outside the scope of the Liability Convention, but is addressed by the broader

[86] *See Compromis* ¶¶ 20, 25.
[87] SPIDR's claims about relative risks to territory from deflection make no claim about the amount of population at risk and fail to account for the risk of tsunami. *See Compromis* ¶ 20.
[88] Outer Space Treaty, *supra* note 78, art. III.
[89] Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, 242 (July 8).

norms of international law.

B. URA is not liable for damages to SPIDR caused by Syd-1 under general international law or the Outer Space Treaty

First, URA is not liable for damages because it is not at fault as its actions are justified by necessity. Second, URA fulfilled its obligations under the Outer Space Treaty.[90] Lastly, SPIDR is estopped from holding URA liable because of its own actions and failure to make a timely protest against URA's planetary defense activities.

1. URA is not at fault under general international law

Under general international law, liability cannot be imputed to URA's actions of planetary defense as fault is to be identified with an unlawful act.[91] This principle is illustrated in the *Prats Case* in which a Mexican national, Salvador Prats, claimed that the United States was liable for its failure to prevent Confederate armies from burning a ship containing his property.[92] However, the Commissioner of the arbitral tribunal stated:

> There is no responsibility with *fault* (*culpa*), and it is too well known that there is no *fault* (*culpa*) in having failed to do what was impossible. The *fault* is essentially dependent upon the will, but as the will completely disappears before the force, whose action cannot be resisted, it is self-evident result that all the acts done before such force, without the possibility of being resisted by another equal or more powerful force, can neither involve a fault nor injury nor responsibility.[93]

In addition to illustrating the general rule of liability on the basis of fault, *Prats* held that an unlawful act is associated with the voluntary character of the act. But more importantly, *Prats*

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[90] Much of the analysis for Article II of the Liability Convention also applies to Article VII of the Outer Space Treaty and is not duplicated here.
[91] BIN CHENG, GENERAL PRINCIPLES OF LAW AS APPLIED BY INTERNATIONAL COURTS AND TRIBUNALS 223 (2006) [hereinafter CHENG, GENERAL PRINCIPLES].
[92] U.S.-Mex. Mixed Claims Comm'n (Prats v. U.S.), 29 R.I.A.A. 187, 189 (1868).
[93] *Id.* at 198.

held that fault only "goes as far as permitted by possibility."[94] Therefore, absent a showing of fault, states are not liable for the actions of hostile third parties (or by the same logic, asteroids) which they do not succeed in preventing from doing damage. SPIDR might attempt to differentiate the present case by saying that here, URA didn't merely fail to stop a third party, it intervened in the Syd-1 emergency in a way that was prejudicial to SPIDR. Such an argument can be shown to be incorrect from the principles of international law.

2. URA has a right under international law to take necessary actions to preserve itself and its population

Self-preservation is a basic premise of international law. Article 51 of the U.N. Charter makes this clear in the qualification it places on its other provisions dealing with conduct between states: "Nothing in the present Charter shall impair the inherent right of individual or collective self-defense."[95] The terminology refers to the classical international law doctrine of self-defense, which was grounded in the more basic right of self-preservation.[96] However, we are not left to infer a modern international law right of self-preservation against natural threats from the right of self-defense against people.[97] The doctrine of necessity, now codified in the Articles on State Responsibility,[98] provides a legal category to deal with, *inter alia*, threats that are

[94] *Id.* at 196.
[95] U.N. Charter art. 51.
[96] *See* HUGO GROTIUS, ON THE LAW OF WAR AND PEACE 18-41 (A.C. Campbell trans., Batoche Books ed., 2001).
[97] *Cf.* Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, 242 (July 8).
[98] Responsibility of States for Internationally Wrongful Acts art. 25, G.A. Res. 56/83, U.N. Doc. A/RES/56/83 (Jan. 28, 2002) [hereinafter State Responsibility]. The Articles are generally accepted as a summary of customary international law. Gabčíkovo–Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7, 39 (Sept. 25).

similar to self-defense insofar as the nature of the risk, but which do not involve war against another state.[99]

In accordance with the inherent right of self-preservation, a state may invoke necessity in order to preclude the wrongfulness of an act not in conformity with an international obligation.[100] A State may invoke necessity if the act is the "only way for the State to safeguard an essential interest against a grave and imminent peril," and "[the act] does not seriously impair an essential interest of the State or States towards which the obligation exists, or the international community as a whole."[101] TYRUS' interception and subsequent deflection of a near-Earth object was the only way for any State to safeguard against damage to sovereign territory or the loss of human life that would have resulted from impact. The probable point of impact was somewhere in the Cold Ocean, but this was not completely certain. Furthermore, assuming that Syd-1 was to reach this impact point, it is known that an impact of Syd-1's size could create a devastating tsunami affecting URA, SPIDR, or neighboring coastal states.[102]

a) URA's actions did not seriously impair the interests of SPIDR

Claims of necessity may be precluded if they seriously impair the interest of another state. Clearly, SPIDR has an essential interest in not sustaining asteroid impact. However, in the present case, SPIDR was already at risk both directly and indirectly. The science of the more

[99] Some scholars have analyzed NEO issues using the doctrine of self-defense: "If states are entitled to use force against a perceived attacking state in the defence of a third state, *a fortiori* they would in principle be entitled to use force in defending a third state without such force being applied against any particular state." Frans G. von der Dunk, *Legal Aspects of NEO Threat Response and Related Institutional Issues*, 2010 SECURE WORLD FOUND. 1, 11. The doctrine of necessity is, however, a more apt way to categorize the issues arising from NEO threats than the doctrine of self-defense, given that there is no intentional use of force against human beings involved in NEO deflection.
[100] State Responsibility, *supra* note 98, art. 25.
[101] *Id.*
[102] *See supra* note 70 and accompanying text.

feasible deflection methods means that "[r]isk shifting is an inseparable element of risk elimination in NEO deflection."[103] This Court has recognized that equity is part of the underlying foundation of international law.[104] It would be inequitable to consider the interest of one already-at-risk state in not having risk temporarily increased to be an essential interest which blocks other states from taking action that is necessary to eliminate the risk. This is especially the case given that URA can show affirmative reasons for all steps of its actions during the use of a gravity tractor in attempting to divert a preexisting risk.

b) URA was legally justified in the use of gravity tractors

First, if SPIDR objects to the legality of gravity tractors more generally, this is not supported by the evidence of the opinion of the international community, which appears to support this method because, *inter alia*, it can move an asteroid without having to be concerned with its composition.[105] Gravity tractors present far fewer legal problems than the most obvious alternative deflection method, nuclear weapons, as gravity tractors can be tested without fear of violating treaties.

Nuclear weapons would likely be legal to use in defense of the planet, however, the Nuclear Test Ban Treaty is written broadly enough as to prevent them from being tested, even for non-military applications.[106] Likewise, the Non-Proliferation Treaty limits the ability of states to access them,[107] and the Outer Space Treaty prohibits stationing them in space.[108] To avoid the

[103] Russell L. Schweickart, *Decision Program on Asteroid Threat Mitigation*, 2008 INT'L INST. SPACE L. 322, 326.
[104] *See supra* note 73 and accompanying text.
[105] *See* DEALING WITH THE THREAT TO EARTH FROM ASTEROIDS AND COMETS 58 (Ivan Bekey ed., 2009) [hereinafter DEALING WITH THREAT].
[106] *See* Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water art. I, Aug. 5, 1963, 14 U.S.T. 1313, 480 U.N.T.S. 43.
[107] Treaty on the Non-Proliferation of Nuclear Weapons, Mar. 5, 1970, 21 U.S.T. 483, 729 U.N.T.S. 161.

issues associated with alternative methods, gravity tractors have been advocated by publicists,[109] and have been under development by the URAC states without record of protest.[110] This evidence of state practice on the part of space powers is relevant, as customary international law rules can apply for a region, like space, or among a group of states, like the space powers.[111]

c) The direction of deflection was legally and scientifically appropriate

Gravity tractor technology is limited to shifting an asteroid's orbit horizontally, which limits the feasibility of deflecting without first passing over populated areas. "'It's going to be slowly dragged across the Earth. You don't have the option of dragging it down through the Antarctic.'"[112] Physics provides further constraints as an

> examination of Gauss's equations governing the evolution of orbit elements under a low-thrust acceleration tells us the best way to change semi-major axis in a secular way is to apply acceleration along the asteroid's direction of motion (or in the opposing direction).[113]

The position of SPIDR appears to be that TYRUS should have been placed opposite the direction of motion, but an examination of the scientific literature reveals a conspicuous lack of simulations involving a deflection using a gravity tractor behind the asteroid. On the other hand, a detailed study has been done on deflecting an asteroid in which the desired position for the spacecraft was the "center-of-mass along the positive velocity direction of the asteroid."[114] Given the limited time-frame for making a decision, it was reasonable to choose the more studied plan and put the spacecraft in front of the asteroid, which had the effect of speeding it up. Given Syd-

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[108] Outer Space Treaty, *supra* note 78, art. IV.
[109] DEALING WITH THREAT, *supra* note 105, at 58.
[110] *Compromis* ¶ 3.
[111] Right of Passage Over Indian Territory (Port. v. India), 1960 I.C.J. 6, 39 (Apr. 12).
[112] Madrigal, *supra* note 68 (quoting Rusty Schweickart).
[113] D.K. Yeomans et al., *Near Earth Object (NEO) Analysis of Transponder Tracking and Gravity Tractor Performance*, 2008 B612 FOUND. 1, 20.
[114] *Id.* at 27.

1's orbit, this meant that the risk would be redistributed to the East rather than to the West. Claiming that this difficult decision was done for an improper reason both contradicts the principle that bad faith is not presumed[115] and also ignores the scientific evidence which provides affirmative reasons to believe that URA had a good-faith basis for its decisions.

Given the situation, there is little doubt that it was necessary for URA to immediately intercept and deflect Syd-1. The threat was much greater than that posed to Britain in the *Caroline Incident*, in which it was indicated that the presence of a ship which was supporting rebels presented a peril which was "instant, overwhelming, and leaving no choice of means, and no moment of deliberation."[116] In that case, the British deliberately and directly violated American sovereignty in a case where the rebels posed no threat to the United States. Here, URA incidentally increased the risk to SPIDR while attempting to stop a threat to URA, SPIDR, and other countries.

URA was afforded a narrow six-month window in order to move TYRUS into position.[117] Furthermore, there is no evidence that URA had time or available resources to deliberate and create alternative solutions. Once the transponder tracking confirmed the precise location of Syd-1, the risk was, though years in the future, certain and thus imminent. As this Court in the *Gabčíkovo–Nagymaros Project* stated, "[A] 'peril' appearing in the long term might be held to be 'imminent' as soon as it is established, at the relevant point in time, that the realization of that peril, however far off it might be, is not thereby any less certain and inevitable."[118]

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[115] *See, e.g.*, Lake Lanoux Arbitration (Fr. v. Spain), 12 R.I.A.A. 281 (1957).
[116] National Jurisdiction: Its Legal Effects, 2 Moore DIGEST § 217, at 412 (quoting correspondence from the *Caroline Incident*).
[117] *Compromis* ¶ 17.
[118] Gabčíkovo–Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7, 42 (Sept. 25).

3. URA fulfilled its obligations under the Outer Space Treaty

SPIDR might claim that URA's act of planetary-defense was a violation of the Outer Space Treaty. However, such an allegation contradicts the interpretation of the international community.[119] Article I of the Outer Space Treaty declares that "States shall facilitate and encourage international cooperation" when conducting activities in outer space.[120] In its interpretation, the United Nations has stated that "States are free to determine all aspects of their participation in international cooperation in the exploration and use of outer space on an equitable and mutually acceptable basis."[121] Similarly, space faring powers such as the United States have declared that Article I "does not create legal obligations with respect to the terms of international cooperation on any existing or future space objects."[122] In sum, though mutual cooperation is required when conducting space activities, an individual state may participate in international cooperation in whatever lawful manner it sees fit.

SPIDR might provide a follow up objection that Article XI of the Outer Space Treaty requires that states inform the "the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of [its space] activities."[123] But, with the term "feasible and practicable," this article implies that a state is merely required to publish information "according to its own discretion."[124] Consequently, "there is no obligation to supply such information in advance, or promptly, or in full . . . ."[125] Though

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[119] *See, e.g.*, Gerry L. Gilmore, *Navy Missile Likely Hit Fuel Tank on Disabled Satellite*, U.S. DEP'T OF DEF. (Feb. 21, 2008), http://www.defense.gov/news/newsarticle.aspx?id=49030 (describing an event in which the United States unilaterally destroyed its own defunct satellite).
[120] Outer Space Treaty, *supra* note 78, art. I.
[121] G.A. Res. 51/122, ¶ 2, U.N. Doc. A/RES/51/122 (Dec. 13, 1996).
[122] CARL Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 43 (1982).
[123] Outer Space Treaty, *supra* note 78, art. XI.
[124] BIN CHENG, STUDIES IN INTERNATIONAL SPACE LAW 253 (1997).
[125] *Id.*

these standards are minimal, URA went beyond such standards and constantly informed SPIDR and the international community of impending risks associated with Syd-1 as well as its intention to mitigate such risks.[126]

SPIDR might object that there was limited notice provided prior to URA choosing to deflect the asteroid by speeding it up. However, this is a result of technological limitations rather than any dereliction of responsibility on the part of URA. Gravity tractor missions are two stage affairs. In many cases

> a radio transponder will have to be sent to the asteroid in order to provide adequately accurate and timely information to rationally commit to a deflection. In such instances the GT design can serve the dual role of first determining the precise orbit of the asteroid and therefore the need for deflection, and then, if a deflection is indicated, execute the mission.[127]

Therefore, prior to TYRUS arriving and using its transponder to track the asteroid, URA did not have the data to be certain of what response would be required. Upon confirming that deflection was necessary, URA needed to act quickly because tractoring efficiency is "a function of start time" in which "[l]onger durations . . . provide ever-increasing statistical confidence in the miss."[128]

Furthermore, a failure to notify would likely be insufficient to find liability even in the absence of these facts as this Court has classified notification failures as procedural failures that did not result in a substantive violation. Thus, a declaration of the procedural violations was sufficient, with no other compensation required.[129]

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[126] *Compromis* ¶¶ 16, 18-20.
[127] Russell Schweickart et al., *Threat Mitigation: The Gravity Tractor*, 2006 B612 FOUND. 1.
[128] D.K. Yeomans et al., *supra* note 113, at 15.
[129] Case Concerning Pulp Mills on the River Uruguay (Arg. v. Uru.), 2010 I.C.J. 1, 106.

4. SPIDR is estopped from assigning liability to URA

Even aside from the general and customary principles of law which show the legality of URA's action, SPIDR is barred from asserting a claim in relationship to many of the actions of URA because it has itself engaged in the same activity. International custom indicates that "[a] State is barred from questioning the legality of a claim which it has itself asserted or condoned."[130] For example, in a time of war between Mexico and France, the Queen's Advocate from Great Britain determined that Mexico had the right adjudicate French prizes in neutral ports.[131] Though France objected to this practice, the British advocate stated, "France can have no right to complain if its Enemy pursues the same course which she has Herself thought fit to adopt."[132]

Both URA and SPIDR were both heavily engaged in the Working Group of Near-Earth Objects of UNCOPUOS, and SPIDR has directly engaged in monitoring of dangerous near Earth objects, while combining this activity with commercial projects. It cannot object to URA doing the same. Furthermore, it cannot attack URA by alleging unilateral action given that its own actions, in claiming exclusive right to monitor the risk from Floyd-4,[133] involved less cooperation with other countries than did those of URA. SPIDR's delay in publishing data regarding risks from Floyd-4 indicates that it interprets requirements of notice in the same way as URA.[134] SPIDR never claimed that deflection itself was illegitimate.[135] When SPIDR

[130] I.C. MacGibbon, *Estoppel in International Law*, 7 INT'L & COMP. L.Q. 468, 497 (1958).
[131] *Id.*
[132] *Id.*
[133] *Compromis* ¶ 8.
[134] *Id*. at ¶ 6.
[135] The conduct of SPIDR's Space Agency may also be considered by the Court. In the *Savarkar Case*, an arbitral tribunal ruled that France had implicitly consented to the arrest through the conduct of its gendarme, who aided the British authorities in the arrest. *See* The Savarkar Case (U.K. v. Fr.) 11 R.I.A.A. 243, 252-55 (1911). If police forces can indicate the attitude of a State

protested, SPIDR only demanded that URA use a method that would have caused Syd-1 to pass over URA territory — it appears that they conceded the appropriateness of deflection as such.

This Court held that the United Kingdom as a sophisticated state on the North Sea should have known that Norway was taking measures prejudicial to its rights and on that basis, the United Kingdom was held to have acquiesced in Norway's fisheries delimitation system by not protesting earlier.[136] SPIDR, a technologically advanced space power involved in NEO mitigation efforts, should have known that gravity tractor deflections involve a binary risk distribution choice and that a deflecting state might have reason to make a decision quickly upon getting a transponder in place. Yet SPIDR was completely silent and did not protest FUSA's deflection efforts from February 2024 to August 2024.[137] During this time, URA constantly informed the international community of its intentions to intercept and alter the orbit of Syd-1.[138] It wasn't until three days before TYRUS was to commence deflection operations that SPIDR chose to protest the efforts of URA.[139] Consequently, SPIDR is estopped from making its claim of wrongfulness through its established acquiescence.

II. URA is not liable for any loss of or damage to the two KNUD spacecraft

Under the Liability Convention, liability for damages to other spacecraft is apportioned on the basis of fault.[140] URA is not liable because it had a right to freely access celestial bodies and neither the damage to KNUD-1 nor the damage to KNUD-2 was brought about as a result of fault on the part of URA.

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towards apprehending a criminal such that another State is not violating international law by sending police into its territory, its space agency might provide evidence of a State's position on asteroid deflection.

[136] Fisheries Case (U.K. v. Nor.), 1951 I.C.J. 116, 138-39 (Dec. 18).
[137] *See Compromis* ¶ 18-21.
[138] *Id.* ¶ 18-19.
[139] *Id.* ¶ 20-21.
[140] Liability Convention, *supra* note 65, art. IV.

A. URA is entitled to free access to celestial bodies under the Outer Space Treaty and international law

URA's argument before this Court hinges on the free access provisions of the Outer Space Treaty, which invalidates SPIDR's argument that URA could not land on Floyd-4. The Outer Space Treaty makes this clear via the broad statement that, "Outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law."[141] The Outer Space Treaty does not limit us to making an inference from the general rule, however, but immediately follows with, "and there shall be free access to all areas of celestial bodies."[142]

As a result, while some areas of space law involve situations not specifically addressed by the treaties, the Outer Space Treaty clearly contemplates the issue of multiple states operating on celestial bodies, and makes it clear that they have the right to do so. Article II makes it clear that this applies to situations in which a state has been on a celestial body, and makes it clear that "use and occupation"[143] does not grant the right to claim sovereignty. In other words, being the first to use or explore does not grant one "priority rights"[144] to use and explore—the free access provisions remain in place regardless.

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[141] Outer Space Treaty, *supra* note 78, art. I.
[142] *Id.* During the negotiations, these provisions were described as having "flowed naturally and logically from the prohibition of claims to territorial sovereignty." Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Conclusion of a Treaty Governing the Exploration of Outer Space, The Moon and Other Celestial Bodies, U.N. Doc. A/AC.105/C.2/SR.58 (1966). So, if SPIDR attempts to justify its interference with free access by claiming that they fall short of a claim of sovereignty, it ignores the intended effects of Article II.
[143] Outer Space Treaty, *supra* note 78, art. II.
[144] *See Compromis* ¶ 8.

1. Inaccurate legal statements from URA and URAC do not affect the claims at bar in the present case

It is true that the provisions in Articles I and II of the Outer Space Treaty invalidate many of the assertions made by both SPIDR and URA in the initial exchanges of protest regarding their respective missions to Floyd-4. Firstly, it is conceded that URA and URAC had no authority to put a moratorium on the extraction of Floyd-4's resources or to limit extraction to members of the Moon Agreement or to licensees of URAC.[145] The agreement between the URAC states is valid between themselves, but it does not bind third party states.[146] However, the damages in the present case did not flow from URA and its partners' erroneous attempts to apply elements of the Moon Agreement to non-parties. Rather, the KNUD probes were damaged as a consequence of a combination of SPIDR's refusal to take into account the right of other states to explore Floyd-4 and emergency circumstances beyond the control of any state.

2. The Abuse of Rights Doctrine cannot be applied proscriptively to ban conduct

SPIDR might attempt to avoid the force of the Outer Space Treaty's provisions by acknowledging them and then claiming that there was some abuse of these rights. This is a difficult argument because there is a presumption against abuse of right.[147] Therefore, the rule does not apply here as it is directed at dealing with cases where a freedom is misused in order to accomplish an illegitimate end.[148] It would not justify a ban on exercising freedom of exploration as, according to the generally accepted view, "the doctrine of abuse of rights is of no force, since it does not have the support at international law to be invoked in a general manner and focuses

[145] *See id.* ¶ 10.
[146] Vienna Convention, *supra* note 74, art. 34.
[147] CHENG, GENERAL PRINCIPLES, *supra* note 91, at 310.
[148] *See id.* at 122.

on compensation for, not prevention of, damage."[149] Ultimately, this legal doctrine cannot be used to ban a state from exercising the general right to freedom to navigate and explore celestial bodies, though it could be used to show liability in cases where there was some ill intent in using a freedom which caused harm, rather than a mission with legitimate goals followed by the threat of a natural disaster, as in the present case.

3. Prior use of an area does not provide an ongoing right to that location

SPIDR's earlier launch of KNUD-1 gave it no right to demand that TYRUS not land in the location desired for KNUD-2. Moreover, TYRUS was not obligated to move in order to let KNUD-2 land because ownership inheres in the space object, not the surface.[150]

It is true that there is precedent for safety zones around a space object.[151] However, there is no actual state practice for exclusion zones around empty previous landing sites on asteroids, and there is certainly no precedent for one state claiming an exclusive right to visit a celestial body.[152]

Similarly, states are required under the Outer Space Treaty to show "due regard" for the interests of other states.[153] However, the general provision cannot be interpreted so as to require a state to completely surrender their explicitly guaranteed right to visit a celestial body. Even in

[149] HOWARD A. BAKER, SPACE DEBRIS: LEGAL AND POLICY IMPLICATIONS 74 (1989).
[150] *Compare* Outer Space Treaty, *supra* note 78, arts. VI, VIII, *with* art II.
[151] *See* F. Kenneth Schwetje, *Protecting Space Assets: A Legal Analysis of "Keep-Out Zones*," 15 J. SPACE L. 131, 132-42 (1987).
[152] Though there have been exclusion zones in near-Earth orbit and there are great physical differences between an asteroid and near-earth orbit, customary norms for the one should not automatically narrow the force of the Outer Space Treaty's free access provisions for the other. Maritime Dispute (Peru v. Chile), 2014 I.C.J. 1, 48, 54 (Jan. 27). In this case, the Court indicated that State practice in the form of government actions at distances of up to 60-80 miles from the coast was not sufficient to establish a customary rule for waters 80-200 miles from the coast. This illustrates the caution of the court in narrowing rights to the commons in a case where the physical similarities between the two areas under consideration were greater than between near earth orbit and asteroids.
[153] Outer Space Treaty, *supra* note 78, art. IX.

the law of the high seas which specifically recognizes some states as having "special situations" and rights to resources,[154] the ICJ has ruled that a state cannot "unilaterally exclude" vessels from access to common resources.[155] Therefore, this is much more the case in outer space, where the relevant treaties do not include such a concept and were intended to exclude it. The Court in *United Kingdom v. Iceland*, with Judge Manfred Lachs presiding, summarized the maritime law as follows:

> The concept of preferential rights is not compatible with the exclusion of all fishing activities of other States. A coastal State entitled to preferential rights is not free, unilaterally and according to its own uncontrolled discretion, to determine the extent of those rights. The characterization of the coastal State's rights as preferential implies a certain priority, but cannot imply the extinction of the concurrent rights of other States.[156]

Accordingly, given the Outer Space Treaty's even more absolute protections of free access, SPIDR cannot invoke Article IX to assert that the mere entry of a foreign spacecraft onto a celestial body it was exploring constitutes harmful interference.[157] The present wording of Article IX was framed so as avoid giving states "'a veto'" over the space activities of other states.[158] In the Treaty Preparation materials for the Outer Space Treaty, the purpose of Articles IX and V is framed as requiring "that the same universal respect for life and limb which had been

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[154] Fisheries Jurisdiction Case (U.K. v. Ice.), 1974 I.C.J. 3, 5-6 (July 25).
[155] *Id.* at 28.
[156] *Id.* at 27-28.
[157] The meaning of Article IX is illuminated by the drafters' discussion of similar language in Article XII: "The words 'on a basis of reciprocity' in article XII did not confer any right or power to veto proposed visits to other countries' facilities on a celestial body. A veto was not compatible with reciprocal rights." U.N. GAOR, 21st Sess., 1st comm. mtg. at 428, U.N. Doc. A/C.1/PV.1492 (Dec. 17, 1966) [hereinafter U.N. Doc. PV.1492]. Given the lack of a broad power to exclude in Article XII, it is incongruent to find such a power in Article IX.
[158] Michael C. Mineiro, *FY-1C and USA-193 ASAT Intercepts: An Assessment of Legal Obligations Under Article IX of The Outer Space Treaty*, 34 J. SPACE L. 321, 329 (2008).

traditional among mariners at sea should also exist among astronauts."[159] There is nothing in the Outer Space Treaty's text or history to indicate that merely landing on a celestial body could violate Article IX. Even if there were some case in which that was possible, there is no evidence for any interference with the operations of KNUD-1 prior to the discovery of an emergency situation which required drastic action.

SPIDR claimed that it alone had the ability to ascertain the safety of landing on the Floyd-4 asteroid. Yet, there is nothing in the facts to indicate a technological gap between the two countries which would have made SPIDR better able to assess the risks of landing on Floyd-4. Indeed, it appears that both countries had the ability to study the surface of that asteroid.[160] The compromis indicates that the probable composition of the Floyd-4 was accurately assessed independently by FUSA before this was confirmed by SPIDR's probe.[161] With regard to TYRUS itself, it is stipulated between the parties that the probe is "highly capable,"[162] thus more specifically undermining SPIDR's attempt to claim that only SPIDR had the ability to make a safety determination. The Court indicated in the *Gabčíkovo–Nagymaros* case that uncertain scientific claims by one state are insufficient to allow that state to derogate from the rights and obligations provided for by a treaty.[163] As a consequence, SPIDR's unsupported claims should not override URA's right of free access to celestial bodies.

[159] U.N. Doc. PV.1492, *supra* note 157, at 428.
[160] *See, e.g., Compromis* ¶¶ 9, 12.
[161] *Id.* ¶ 7.
[162] *Id.* ¶ 5.
[163] Gabčíkovo–Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7, 42 (Sept. 25).

B. URA is not liable for damages to KNUD-2

URA is not liable for damages to KNUD-2 which resulted after it failed to dock with the surface. This is true firstly because the Outer Space Treaty allows for use[164] of space and celestial bodies, includes the right to engage in activities which modify the surface of a celestial body.[165] Further, SPIDR itself has engaged in activities intended to modify the surface,[166] and is thus estopped from claiming that modifying the surface violates space law.

A further problem with SPIDR's claim is that in international litigation "the burden of proof falls on the claimant," and in the case of KNUD-2, SPIDR cannot satisfy it with regard to the issue of causation.[167] The compromis records that there were multiple delays as a result of "anomalies" with regard to KNUD-2, but it is not recorded whether these problems were resolved prior to launching.[168] At the same time, the evidence indicates that SPIDR was in a hurry to launch the KNUD-2 spacecraft in order to beat TYRUS to the asteroid.[169] While SPIDR was certainly within its rights to attempt to get to the asteroid first, in doing so it assumed the risk of damages resulting from rushing the mission.

The mutually agreed upon facts with regard to the launch of KNUD-2 do not by themselves show negligence on the part of the SPIDR Space Agency as far as the launch itself. Nonetheless, these facts contextualize the problem KNUD-2 had attaching itself to the asteroid,

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[164] *Cf.* STEPHEN GOROVE, STUDIES IN SPACE LAW: ITS CHALLENGES AND PROSPECTS 217 (1977).
[165] Gorove, in assessing the legality of a hypothetical mission to remove one of the moons of Mars from its current orbit stated, "the drafters did not intend to go beyond the textual stipulations and impose on outer space the requirement that it must be used exclusively for peaceful purposes." *Id.* at 89 n.12.
[166] *See Compromis* ¶¶ 8, 9, 23, 24, 28.
[167] CHENG, GENERAL PRINCIPLES OF LAW, *supra* note 91, at 334.
[168] *See Compromis* ¶ 13.
[169] *Id.*

an activity which was already known to be risky.[170] It is stipulated that the surface had been altered as part of the ordinary operation of the TYRUS spacecraft, though it is not clear that the inability to attach resulted from the alterations.[171] More specifically, this Court has said in cases of inference of fact from indirect evidence, such as would be needed to support the SPIDR claim here, the evidence would need to "leave *no room* for reasonable doubt."[172]

If for some reason the Court does not wish to apply this strict standard to the current facts, it remains a general rule of international law that "[t]he international responsibility of the State is not to be presumed."[173] In the event of lack of clarity regarding causation, the Court should rule to exonerate URA on this issue.

Even assuming this unproven connection, it is important to note that the compromis also indicates that SPIDR knew the URA spacecraft was about to begin use and exploration of Floyd-4. SPIDR had the responsibility to design a craft that could interact with a changing space environment, including changes resulting from the legitimate space activities of other parties.[174]

C. URA is not liable for damages to KNUD-1

SPIDR may claim that URA's re-launch of TYRUS from the surface of Floyd-4 caused damage to KNUD-1. However, there was a threat to human life on Earth which required urgent

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[170] The European Space Agency's probe, *Philae*, has similar difficulty in attaching to a comet. *See* Terrence McCoy, *Why Rosetta's Malfunctioning Anchoring Harpoons are 'Clearly Worrisome,'* WASH. POST (Nov. 13, 2014), http://www.washingtonpost.com/news/morning-mix/wp/2014/11/13/why-rosettas malfunctioning-anchoring-harpoons-are-clearly-worrisome/.
[171] *See Compromis* ¶ 22.
[172] Corfu Channel Case (U.K. v. Alb.) 1949 I.C.J. 4, 18 (Apr. 9).
[173] *See* CHENG, GENERAL PRINCIPLES, *supra* note 91, at 305 (citing Spanish Zone of Morocco Claims (U.K. v. Spain), 2 R.I.A.A. 615, 619 (1924)).
[174] SPIDR claims damages for expected profits to KNUD-2 mission. *Compromis* ¶ 28. Note that the there is authority indicating that causation is construed more narrowly in cases like the present where there is no ill intent. U.S.-Venez. Mixed Claims Comm'n (U.S. v. Venez.), 9 R.I.A.A. 115, 121 (1903) ("[International law] denies compensation for remote consequences, in the absence of evidence of deliberate intention to injure.").

action as it is stipulated there was a limited window of time in which TYRUS could be used to redirect Syd-1.[175] Because of humanitarian concerns, TYRUS was only on Floyd-4 for twenty five days and scrapped a possibly commercially viable mission.[176] As an international tribunal put it in the *Naulilaa* case, it is "'necessary to exclude losses unconnected with the initial act, save by an unexpected concatenation of exceptional circumstances.'"[177] Therefore, the damage from relaunch cannot be used to show that TYRUS should not have touched down in the first place. No evidence has been submitted showing TYRUS spacecraft would have hastily relaunched had it not been for the emergency. If, in the absence of the threat from Syd-1, the TYRUS spacecraft would not have relaunched during the lifetime of KNUD-1, this seriously undermines SPIDR's attempt to attach liability on the basis of their claims regarding risks from the initial landing.[178]

Given what the international community has said about the special importance of human life in a variety of instances, it is consistent with international law for URA to apply a similar standard to a danger to a large area of the Earth's surface, and send its spacecraft to attempt to protect human life with all possible speed. While not directly binding on space, the Law of the Sea Convention ("UNCLOS") indicates the practice of states in a similar area of law, and affirmatively requires that vessels "proceed with all possible speed to the rescue of persons in distress, if informed of their need of assistance."[179]

The Outer Space Treaty contains a parallel provision for the protection of astronauts: "[T]he astronauts of one State Party shall render all possible assistance to the astronauts of other

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[175] *Compromis* ¶ 17.
[176] *Id.* ¶¶ 12, 19.
[177] CHENG, GENERAL PRINCIPLES, *supra* note 91, at 242.
[178] For emergency and foreseeability as reasons for exoneration, see BAKER, *supra* note 149, at 70, 84.
[179] United Nations Convention on the Law of the Sea art. 98, Dec. 10, 1982, 1833 U.N.T.S. 397.

States Parties."[180] Paralleling the protections to persons at sea in UNCLOS, the protection in Article V of the Outer Space Treaty is to people, not merely to spacecraft in general. Likewise, the Convention on Rescue and Return of Astronauts applies different levels of protection to human life and property.[181] Therefore, to the extent the international community has considered the issue with regard to space activities, it has continued the international practice of treating human life as of more value.

Examining the *travaux tréparatoires*, we find this straightforward reading of the treaties confirmed. The incorporation of maritime rules for preserving human life was explicitly referenced during the negotiation of the Outer Space Treaty.[182] Likewise one delegate said regarding the issue of reimbursement during the preparation of the Rescue Agreement,

> Clearly the same principle should not be applied to expenses arising out of operations conducted to assist or rescue astronauts, whose safe recovery and return would be analogous to air and sea rescue operations. The general rule in such cases was not to claim for the cost of rescue operations in so far as they related to assistance and distressed persons. The return of a space vehicle [would] have no humanitarian implications.[183]

Liability Convention delegates specifically referenced the connection between the principles in the treaties and framed both as being driven by humanitarian considerations.[184] So, the preference for human life in the major space treaties is not an illusion created by an overly close reading in the text, but was in fact a distinction that diplomats at the time considered important.

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[180] Outer Space Treaty, *supra* note 78, art. V.
[181] *See* GOROVE, *supra* note 164, at 95-115.
[182] U.N. Doc. PV.1492, *supra* note 157, at 428.
[183] Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Draft International Agreement on Assistance to and Return of Astronauts and Space Vehicles, U.N. Doc. A/AC.105/C.2/L.9 (1964).
[184] *See* U.N. Doc. SR.92, *supra* note 82; *see also* Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., Draft Agreement on Liability for Damage Caused by Objects Launched into Outer Space, U.N. Doc. A/AC.105/C.2/SR.52 (1965).

Given the coherence of multiple sources of law, it is reasonable to conclude that customary international law supports giving people priority over property.

URA publicly announced that it intended to make the launch four days prior to doing so, thus they gave SPIDR time to take measures to prepare KNUD-1 for the launch. It would be unreasonable to expect URA to limit potentially life-saving activity out of a concern for a robotic probe. Given that URA acted reasonably under the circumstances, it committed no wrongful or negligent act in relaunching, and in a fault-based system, cannot be held liable for damages sustained by KNUD-1.

SUBMISSIONS TO THE COURT

For the foregoing reasons, the Government of the United Republic of Adventura, Respondent, respectfully requests the Court to adjudge and declare that:

1. URA is not liable under international law for damages to SPIDR caused by Syd-1; and

2. URA is not liable under international law for any loss of or damage to the two KNUD spacecraft.