27th MANFRED LACHS SPACE LAW MOOT COURT COMPETITION

Case Concerning Conflicting Activities in Outer Space, Planetary Protection, and Outer Space Security *(The Democratic Republic of Neapilia v. The Republic of Kalvion)*

*Melissa Force**

PART A: INTRODUCTION

The final rounds of the 27th Manfred Lachs Space Law Moot Court Competition were held in Bremen, Germany during the week of October 4, 2018, coinciding with the International Institute of Space Law (IISL) Colloquium held every year during the International Astronautical Congress. This year's regional finalists argued the moot court problem entitled, the "Case Concerning Conflicting Activities in Outer Space, Planetary protection, and Outer Space Security (The Democratic Republic of Neapilia v. The Republic of Kalvion)," co-authored by Marco Ferrazzani, European Space Agency, and George Kyriakopoulos, National and Kapodistrian University of Athens. This year's moot problem concerns activities in outer space carried out in parallel by two States, planetary protection and outer space security.

From a field of teams competing across five continents within four regional rounds over the past year, the Louisiana State University (North America), Belarusian State University (Belarus), University of Pretoria, South Africa (Africa), and the Symbiosis Law School, at Pune, India (Asia Pacific) were victorious in their respective regional competitions and advanced to compete in the semi-final rounds on Tuesday, October 2, 2018. The teams were paired based on the memorial scores, judged this year by Melissa de Zwart, Phetole Sekhula, Marco Ferrazani, George Kyriakopoulos, Catherine Doldirina, Chuck Dickey and Steven Freeland. In the first of these matches, judged by Tanja Masson-Zwaan, Joanne Gabrynowicz, Sridhara Murthi K R and José Monserrat Filho, the University of Pretoria South Africa (Africa) competed and prevailed against the Belarusian State University (EU). In the second of the semi-final matches, judged by Leslie I. Tennen, Marco Ferrazzani, George Kyriakopoulos and Sumara M. Thompson-King, the Symbiosis Law School

* Co-Chair, Manfred Lachs Space Law Moot Court Committee, IISL.

in Pune, India (AP) competed and prevailed against Louisiana State University (NA).

On October 4, 2018, the World Final round of the competition was held during the IAC at the Hanseatic Federal Court of Bremen, Germany in the famous Schwurgerichtsaal chamber, before current and former judges from the International Court of Justice in The Hague, H.E. Judge Hanqin Xue, (China) Vice President, International Court of Justice; H.E. Judge Peter Tomka, (Slovakia) International Court of Justice; and H.E. Judge Kirill Gevorgian, (Russian Federation) International Court of Justice. Pleading on behalf of the Applicant was the team from the Symbiosis Law School in Pune, India, represented by Ms. Shraddha Dubey, Ms. Someny Singhal and Mr. Malay Srivastava (support on brief) and faculty representatives, Pleading on behalf of the Respondent was the team from the University of Pretoria South Africa, represented by Mr. Simon Botha and Mr. Simon Motshweni. Ruling from the bench, the panel pronounced the Respondent as the prevailing party and declared the University of Pretoria, South Africa, as the winner. The panel then announced its decision to award Best Oralist honors to Mr. Simon Botha, from the University of Pretoria.

Following the competition, the Annual IISL Gala Dinner was held the Meierei Restaurant, Bürgerpark Bremen. The winning team was awarded the Manfred Lachs trophy (the original of which is on permanent display at the International Court of Justice in The Hague), the Lee Love Award for Best Team, a commemorative plaque and certificates to each team member. The runner-up team, the Symbiosis Law School in Pune, India, was awarded a commemorative plaque and certificates to the team members. The two semi-finalists, Belarusian State University (represented by Darya Bohdan and Alena Laurenava, guided by faculty advisor, Ekaterina Kouznetsova) and Louisiana State University (represented by Zachary Miller and Max Roberts, guided by faculty advisor, Jeff Brooks) were recognized with commemorative plaques and certificates for the team members. Belarusian State University was presented the Eilene M. Galloway Award for Best Memorials, awarded to the team with the highest combined score for memorials in the competition, and certificates were presented to the team members, Darya Bohdan and Alena Laurenava. The winner of the best oralist award, Mr. Simon Botha, from the University of Pretoria South Africa, was awarded the Sterns and Tennen Award for Best Oralist and a certificate. In addition, all the students received awards of law books donated by Eleven International Publishing, Brill/Nijhoff and Springer Publishing.

The Asia Pacific Regional took place in Adelaide, Australia 9-13 April 2018 among 30 teams representing Australia, India, Indonesia, Singapore, Iran, Japan, China, Pakistan, and Hong Kong. The winner was Symbiosis Law School of Pune, India, comprised of Malay Srivastava, Shraddha Dubey and Someny Singhal.

The African regional was held in Pretoria, South Africa 15-16 May 2018 among 4 teams from Uganda, Nigeria,, and South Africa (2). The Winner

was the University of Pretoria, Pretoria, South Africa, comprised of Simon Botha and Simon Motshweni.
The North America regional competition took place in Washington, D.C. 23-24 March 2018 among 18 teams, including a team from Canada. The winner was the team from Louisiana State University, comprised of Zach Miller and Max Roberts.
The European regional competition took place in Lisbon, Portugal 21-24 May 2018 among 25 teams from 18 different countries. The winner was the team from Belarusian State University (Belarus), comprised of Alena Laurenava and Darya Bohdan.

Participants in the African Regional Rounds:

- Makerere University, Kampala, Uganda
- Obafemi Awolowo University, City of Ile-Ife, Nigeria
- UNISA from South Africa
- University of Pretoria, Faculty of Law, Pretoria, South Africa

* Niger Delta pulled out because of financial constraints

Participants in the European Regional Rounds:

- University of Lisbon
- Nova Law School
- University Libre de Bruxelles
- St. Petersburg University
- Peoples Friendship University of Russia
- Belarus State University
- University of Lodz
- Kingston University
- University of Luxembourg
- University of Ljubljana
- University of Helsinki
- University of Leiden
- University of Vienna
- University of Wroclaw
- University of Orebro
- MIGMO University
- University of Genoa
- University of Paris Sud
- University of Sapienza
- Lauphana University

Participants in the North American Regional Rounds:

- Florida State University

- Louisiana State University
- George Washington University Law School
- Georgetown University Law Center
- University of Hawaii William S. Richardson School of Law
- University of Nebraska College of Law
- University of Mississippi
- New York University School of Law
- McGill University - Institute of Air and Space Law
- J. Reuben Clark Law School (BYU)
- St. Thomas University School of Law
- University of Michigan Law School
- University of California, Berkeley School of Law
- Texas Tech University School of Law
- University of Colorado Law
- University of Notre Dame Law School
- William and Mary Law School
- Osgoode Hall Law School (York University)

Participants in the Asia Pacific Regional Rounds:

The teams who registered and submitted written memorials are (teams in bold participated in the oral rounds):

- School of Law, Raffles University
- **Institute of Law, Nirma University**
- **The University of Adelaide**
- **City University of Hong Kong**
- ILS Law College Pune
- **National University of Singapore**
- **Symbiosis Law School, Pune**
- **Kyoto University**
- **National Law School of India University**
- International Christian University
- **West Bengal National University of Juridical Sciences**
- **Gujarat National Law University**
- **Chanakya National Law University**
- National Law University, Delhi
- **School of International Relations**
- **National Law University, Jodhpur**
- **The National University of Advanced Legal Studies, Kochi**
- **Keio University**
- **Wuhan University**

- **National Law Institute University**
- **China University of Political Science and Law**
- National Law University Odisha
- **O.P. Jindal Global University**
- **Dr. Ram Manohar Lohiya National Law University, Lucknow**
- **Beijing Institute of Technology (BIT)**
- Government Law College, Mumbai, Maharashtra
- Symbiosis Law School Hyderabad

Participants in the Final Rounds:

Symbiosis Law School in Pune, India
Students: Ms. Shraddha Dubey, Ms. Someny Singhal and Mr. Malay Srivastave (support on brief)

University of Pretoria, South Africa, Africa
Students: Mr. Simon Botha and Mr. Simon Motshweni

Awards:

- **Lee Love Award for Best Team:** University of Pretoria South Africa, Africa (Mr. Simon Botha and Mr. Simon Motshweni)
- **Sterns and Tennen Award for Best Oralist:** Mr. Simon Botha, University of Pretoria, South Africa
- **Eilene Galloway Award for Best Memorials:** Belarusian State University (Ms. Darya Bohdan and Ms. Alena Laurenava)

Judges of the Final Round:

- H.E. Judge Hanqin Xue, (China) Vice President, International Court of Justice
- H.E. Judge Kirill Gevorgian, (Russian Federation) International Court of Justice
- H.E. Judge Peter Tomka, (Slovakia) International Court of Justice

Sponsors of the regional teams:

- Sponsor of North American Team: National Aeronautics and Space Administration (NASA)
- Sponsor of European Team: European Centre for Space Law (ECSL)
- Sponsor of Asia Pacific Team: Japan Aerospace Exploration Agency (JAXA)
- Sponsors of African Team: Department of Trade and Industry, Republic of South Africa and South African National Space Agency

Sponsors of the Finals:

- Brill Nijhoff Publishers
- Eleven International Publishing
- European Space Agency (ESA)
- Excalibur Almaz
- International Astronautical Federation
- International Court Of Justice
- Springer Publishing Company
- Secure World Foundation
- South African Space Association

PART B: THE PROBLEM

Agreed Statement of Facts:

1. The Democratic Republic of Neapilia is a developed country. Until recently, its national oil and natural gas reserves have been contributing to the country's economic stability and consistent growth. Neapilia's strong economy has enabled it to invest significantly in space activities and related technologies. Within the domain of space exploration and planetary science, Neapilia has particularly focused on the creation of a human settlement on Mars.
2. Following a series of successful robotic missions on the surface of Mars, in 2040 the Neapilian Space Agency (NSA) launched a Civil Space Station orbiting Mars (known as 'TheosAres') and registered it in the Neapilian national register of objects launched into outer space.
3. The Republic of Kalvion is a former developing country, the economy of which has experienced massive growth since 2025. Such growth has been accompanied by the development of space activities, both civil and military. However, Kalvion lacks domestic non-renewable energy resources and traditionally has relied on imported oil and gas in order to sustain its economic growth. As a consequence, it has suffered longer and more severely than other States from the depletion of Earth's non-renewable natural resources, and has been forced to look for alternative sources of energy.
4. By 2045 the global population of Earth exceeded 9.2 billion and the United Nations (UN) forecast that renewable energy sources will not meet mankind's growing needs for long. Damage to Earth's environment over many decades from over-population and global warming has progressively made the environment less hospitable to agriculture. Lack of resources has triggered massive migrations and social unrest in several countries. The Food and Agriculture Organization has been preparing the world community for a food crisis in response to clear signs that Earth's natural reserves have reached critical levels.

5. Since 2035, UN Member States have been discussing possible collective solutions. However, no agreement has been reached and some States have started to look for alternative separate solutions.
6. Neapilia is one of the countries most affected by the crisis, which is exemplified by an ongoing housing crisis brought on by the population explosion within its small territory, spawning widespread social rioting since 2030. Neapilia can no longer rely on its energy surplus to fully fund new outer space programmes as it is now struggling to meet the needs of its own population.
7. In this regard, Neapilia's government issued a national space policy act stating, among other things, that exploitation of outer space could help overcome current global and national overpopulation and Earth resources crisis and invited the private sector to submit proposals for space-based solutions.
8. Salus Patriae ad Astra Corporation (SalPA Corp.) was a powerful private Neapilian company with an historical interest in innovative technology, in particular, in the field of outer space exploration and use. SalPA Corp. developed an ambitious proposal – to make Martian water resources accessible to humans. Mars has long been considered as the first potential destination for human resettlement, due to its surface conditions and the existence of water deposits at its poles and subsurface. Despite an average temperature on Mars of approximately –85°F (–65°C), it is still considered to be the only available hospitable celestial body in the Solar system (besides our planet), considering its proximity to Earth and its accessibility given the existing level of Neapilia's propulsion technology.
9. In June 2046, SalPA Corp. proposed a new invention called Anaklan, comprised of a pair of mirrors designed to orbit the poles of Mars and reflect the heat of the Sun, causing the existing CO2 ice cap (dry ice layer) to sublimate leading to the warming of the planet's surface. SalPA Corp. envisioned that this would melt the water ice and irrigate a large area of the planet, thereby contributing to the creation of necessary conditions for a human settlement on Mars.
10. The first stage of the Anaklan operation as announced by SalPA Corp. was a Technology Trial, during which:
    i. TheosAres would be used as a base of space operations.
    ii. Two Anaklan mirrors would be deployed in orbit from TheosAres over the poles of Mars (by 2052), separated by 180o in order to heat alternatively as they pass the north and south poles of the planet.
    iii. Astronauts on board TheosAres would practice manoeuvres with the mirrors and monitor the impact on heat reflection on the CO2 ice cap and the underlying water ice layer at the poles of Mars. The results of the Technology Trial were to be reported by the end of 2053.

iv. SalPA Corp. would concurrently develop a prototype of Habitable Atmospheric Modules (HAMs) which could sustain life and autonomous farming in the adapted atmospheric conditions and wetlands areas of Mars.

11. Subject to successful testing, SalPA Corp. anticipated the production of a series of larger Anaklan mirrors with the first deployments planned for 2060, with as many as 50 Anaklan mirrors operational by 2070 (the so-called '50 Klans of SalPA'). The Anaklan mirrors had been projected to warm the atmosphere of Mars sufficiently to enable the first HAMs to be deployed by 2063, at which time sufficient quantities of liquid water would be liberated on the surface.
12. All the technologies were to be designed and manufactured by SalPA Corp., which held the international patents protecting its exclusivity in the manufacturing of orbital mirrors and the early technology conceived in connection with the HAMs. No other equivalent technology exists elsewhere.
13. After the creation of supporting infrastructure, SalPA Corp. allowed public and private investors from around the world to purchase a license to use HAMs directly from SalPA Corp. in order to establish autonomous settlements on Mars. The license fees would more than recover the costs of the technology development and deployment of the orbital mirrors.
14. Neapilia's government immediately backed up SalPA Corp.'s Anaklan operation and HAM's development by investing public funds and taking a 49% equity stake in the company. Under its national space law, Neapilia authorised SalPA Corp. to carry out the Technology Trial and to use TheosAres and its crew for this purpose.
15. When the first mission to TheosAres launched in February 2050, Neapilia immediately included it in the Neapilian national registry and informed the UN Secretary General about the launch of a space vehicle owned and operated by SalPA Corp., declaring the generic purpose of the mission as a 'peaceful space exploration mission to Mars'.
16. In 2040, Kalvion, facing its own energy resources problem, decided to develop a large space programme with the aim of finding natural resources on other celestial bodies of the Solar system for the purposes of their extraction and exploitation. After the exploration phase's completion in 2045, Kalvion chose Mars as the most suitable planet to start mining operations. In the same year Kalvion authorised, under its national law, SIENAR Industries (SIENAR), a multinational company established in Kalvion and specialising in cutting edge space and mining technology to exploit any space resources they might obtain on Mars.
17. In 2048 SIENAR launched a series of spacecraft carrying Unmanned Mining Vehicles (UMVs) from Kalvion's territory deploying the UMVs directly to Mars. The UMVs developed by SIENAR were equipped with nuclear power generators, to provide for a very long operational lifetime.

By the end of 2049, the mining activities became fully operational and started to provide Kalvionian cargo spaceships returning to Earth with the necessary space resources.

18. In March 2051, SIENAR deployed the second generation of nuclear-powered UMVs on Mars (UMVs Mk2) with augmented mining capacity. Concurrently, SIENAR launched a scanning satellite, named "Aeneas-1", into polar orbit around Mars, in order to derive maximum benefit from the new UMV Mk2 technology. Aeneas-1 was designed to reveal high concentrations of Mars' resources and to remotely control UMVs Mk2 operations. Upon commencement of operation the "Aeneas-UMV Mk2" system proved its capability to provide Kalvion with a long-term viable solution for the domestic non-renewable natural resources substitution.
19. In November 2052, SalPA Corp. started the Technology Trial and deployed Anaklan mirrors in polar orbit around Mars. Astronauts on board TheosAres carried out practical manoeuvres with the mirrors and tested their effectiveness. This initial success prompted the NSA to issue an international press release describing the specific nature of the '50 Klans of SalPA' programme and inviting all nations to take advantage of the solution pioneered by SalPA Corp. 'for the benefit of Humankind'. In particular, public and private entities from all nations were invited to pre-order HAMs from SalPA Corp/ in advance of the full-scale deployment of the '50 Klans of SalPA'.
20. It was soon clear that 'the 50 Klans of SalPA' programme was very popular and SalPA Corp. was approached by a number of States and high net-worth individuals willing to purchase HAMs 'subject to successful demonstration of the first Anaklan mirrors during the Technology Trial'.
21. Kalvion's government was deeply troubled by NSA's announcement. SIENAR's UMVs and new UMV Mk2 specifically were designed to operate in Mars' natural environment. The '50 Klans of SalPA' programme, if successful, would trigger a series of modifications in the temperature of the surface of Mars, in the composition of its atmosphere and in the atmospheric pressure, with the result that SIENAR's technologies would no longer be fit for their primary mission and the delivery of space resources to Kalvion would have to eventually cease.
22. A large number of developing States were also alarmed by NSA's announcement. Some of them had very high population density and concurrent land shortages but did not have the sufficient budgets to obtain HAMs from SalPA Corp. and establish their own settlements on Mars. In the meantime, they worried that developed States and wealthy individuals would crowd all the 'best places' on Mars with their own HAMs.
23. In March 2053, Kalvion formally contacted Neapilia and requested the cessation of SalPA Corp.'s Anaklan Technology Trial specifying the consequences of such space activities for Kalvion's space mining

programme. In March 2054, an official response from the Neapilian Minister of Commerce invited Kalvion to enter into a HAMs' purchase agreement with SalPA Corp.

24. Meanwhile, the communication between Kalvion's Aeneas-1 and the UMVs Mk2 on the surface of Mars was lost despite the repeated efforts of SIENAR's technicians to restore it. Kalvion called an independent body of experts to investigate the problem, which concluded that the interruption of communication was due to the disturbances in the atmosphere and temperature conditions of Mars, possibly caused by the deployment of the Anaklan mirrors by SalPA Corp. The cessation of communication between Aeneas-1 and the UMVs Mk2 led to the termination of their mining activity on the surface of Mars.
25. Kalvion spearheaded a meeting of Heads of States for developing and developed nations who opposed the '50 Klans of SalPA' programme. The meeting, which took place in the Seychelles on 10 September 2054, was attended by Heads of States collectively representing nearly 9/10 of the Earth's population. The meeting culminated in the adoption of the 'Seychelles Declaration', which expressly stated that the environmental conditions of Mars should remain unaltered until international consensus and a multilateral agreement is reached on a specific regime of the exploitation and allocation of Mars' natural resources.
26. In reliance on the Seychelles Declaration, in November 2054 Kalvion formally requested the UN Security Council to condemn the acts of environmental intervention on Mars as constituting 'a threat to international peace and security' and to adopt appropriate measures in conformity with the UN Charter should Neapilia not cease such activities.
27. After a contentious meeting, with expression of conflicting views, the UN Security Council unanimously adopted a Resolution on 13 November 2054, which 'expressed concern' about 'the situation on Mars' and 'urged' Neapilia, while undertaking Mars exploration activities, 'to abide or comply with the principles enshrined in the treaties on outer space and, in particular, in the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967) and international space law and to take into consideration the rights and duties of other States in accordance with international law'.
28. In response to the above decision of the UN Security Council, in August 2055, the Prime Minister of Neapilia declared that the Mars operations are conducted with 'the noblest intentions' of his country 'for the welfare of all Humankind', that this process could not be reversed as it would be 'a disaster for Neapilia and all Humankind', and finally that Neapilia would keep the Security Council informed about the evolution of the Mars environmental intervention.

29. Following the UN Security Council's failure to stop SalPA Corp.'s '50 Klans' programme, Kalvion declared in a public statement its decision to adopt 'protection measures' if Neapilia would not cease immediately its intervention on Mars. Neapilia did not formally respond to this statement.
30. On 5 January 2056, TheosAres' personnel observed the two Anaklan mirrors orbiting Mars gradually beginning to change their angle by 3o per day. In-depth investigations showed that Anaklan's control system had been overtaken by a remote electronic interference from an unknown source outside the station.
31. The TheosAres staff was not able to restore control of the orbital mirrors, which had changed their angle by 30o within 10 days. The new positioning of the mirrors led the process of heating the Mars' poles to an unexpected end. Due to high scale of command interference, the system was irrevocably 'locked', requiring the installation of an entirely new control system.
32. SalPA Corp announced that it was unable to continue the '50 Klans' programme, which would be suspended indefinitely. All pending orders and contracts for HAMs were cancelled because the orbital mirror technology could not be demonstrated to the satisfaction of clients before the Technology Trial was suspended. SalPA Corp. thereafter filed for bankruptcy and was liquidated.
33. On 17 January 2056, the Kalvionian Minister of Foreign Affairs revealed that the interference with the Anaklan control system had been undertaken by cyber experts from Kalvion. He further stated that 'these lawful countermeasures would be maintained pending a declaration of the authorities of Neapilia that the '50 Klans' programme would be definitely abandoned'. Neapilia severely protested against the aforementioned declarations, nevertheless without producing any result whatsoever.
34. In an attempt to settle their disputes, Neapilia and Kalvion entered into diplomatic consultations, the results of which proved inconclusive. Neapilia initiated these proceedings by Application to the International Court of Justice. Kalvion accepted the jurisdiction of the Court and the parties submitted this Agreed Statement of Facts.
35. Neapilia requests the Court to adjudge and declare that:
    1. Kalvion's actions constituted an unlawful cyber-attack against Neapilia, contrary to international law and to the peaceful uses of outer space;
    2. Kalvion is liable for the total loss of the "50 Klans" programme and for all consequential damages, loss of profit and liquidation of SalPA Corp.'s; and
    3. Neapilia is not liable for the cessation of Kalvion's mining activities on Mars.

36. Kalvion requests the Court to adjudge and declare that:
    1. Kalvion's action preventing the operations of the Anaklan orbital mirrors was a lawful, non-aggressive, necessary act to defend its access to space resources and to ensure the protection of Mars' environment;
    2. Kalvion is not liable for any damage relating to the interruption of the "50 Klans" programme nor for any consequence on SalPA Corp.'s; and
    3. Neapilia is liable for the cessation of Kalvion's mining activities on Mars.
37. Both Neapilia and Kalvion are Parties to the UN Charter and the five treaties on outer space. Within the time frame of the case, no international exploitation regime has been established on Mars pursuant to Article 11 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979). There is no issue of jurisdiction before the International Court of Justice.

Special Clarification to the 2017 Lachs Competition Problem:
The reference to *ex aequo et bono* in the first submission in the Problem does not apply beyond that express reference.

PART C: BEST MEMORIALS

Belarusian State University, Belarus
Students: Ms. Darya Bohdan and Alena Laurenava

ARGUMENT OF APPLICANT, THE DEMOCRATIC REPUBLIC OF NEAPILIA

I. KALVION'S ACTIONS CONSTITUTED AN UNLAWFUL CYBER-ATTACK AGAINST NEAPILIA, CONTRARY TO INTERNATIONAL LAW AND TO THE PEACEFUL USES OF OUTER SPACE

A. EXISTING INTERNATIONAL LAW APPLIES TO CYBER-OPERATIONS

The most highly qualified publicists, whose teachings represent subsidiary means of determination of the rules of law under Art.38(1)(d) of the ICJ Statute, converge in the opinion that existing international law applies to cyber-operations though currently there are no cyber-specific international norms.[1] Moreover, state practice supports applicability of international law to cyberspace: it is stressed in UNGA Resolutions that in the digital age when

1 TM 2.0, p.3; Tsagourias, p.13; Pirker, p.193-194; Osula/Roigas, p.20-21; Hathaway/Crootof, p.817; Delibasis, p.15-17

cyber threats may endanger international stability and welfare,[2] it is necessary to respect the role of international law in cyber-relations of states.[3] Therefore, international law applies to cyber-operations.

B. KALVION'S ACTIONS CONSTITUTE A CYBER-ATTACK

There is no "*cyber-attack*" definition in treaties or customary law, yet one may be deduced from different doctrinal sources and state practice. Kalvion's actions constitute a cyber-attack as defined by Tallinn Manual 2.0,[4] ICRC Report 31IC/11/5.1.2,[5] the U.S. Memorandum on Joint Terminology for Cyberspace Operations,[6] the U.S. Department of Defence's Dictionary of Military Terms,[7] NATO Glossary of Terms and Definitions[8] and doctrine.[9] All these sources set qualifying element for cyber-operation to be considered as cyber-attack: damage or destruction. For the purpose of the cyber-attack, damage to the object is understood as the interference with functionality, especially the one, which requires the reinstallation of the operating system.[10] The cyber-attack undertaken by Kalvion's cyber experts[11] rendered Neapilian control system completely non-functional.[12] To restore the functionality an entirely new control system would have to be reinstalled,[13] hence, Kalvion's cyber-operation caused damage. Since Kalvion's cyber-operation caused damage to Neapilian objects, it constitutes a cyber-attack.

C. THE CYBER-ATTACK IS UNLAWFUL AS IT CONSTITUTES AN INTERNATIONALLY WRONGFUL ACT

Under customary rule of international law an action or omission constitutes an internationally wrongful act when it is attributable to a state and constitutes a breach of state's international obligation.[14] Norms of state responsibility are applicable to cyber activities of states.[15] Kalvion's cyber-attack constitutes an internationally wrongful act as it is attributable to Kalvion (1) and constitutes a breach of its international obligations (2).

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2 Res.64/211; Res.69/28
3 Res.70/125
4 TM 2.0, p.415
5 Report 31IC/11/5.1.2, p.37
6 Memorandum for Chiefs, p.5
7 Military Dictionary
8 NATO Glossary, p.2-C-11
9 Hathaway/Crootof, p. 826; Lin, p.63
10 TM 2.0, p.417-418 (para 11); Report 32IC/15/11, p.41; Hathaway/Crootof, p.826
11 Facts, para 33; Memorial I.C.1.
12 Facts, para 31
13 Facts, para 31
14 Art. 2 ARS; Phosphates in Morocco, p.28; Consular Staff, p.29; Gabčikovo-Nagymaros, p.54
15 Klabbers, p.485; TM 2.0, p.80 (para 4)

1. The cyber-attack is attributable to Kalvion

Conduct shall be considered as an act of a state under international law if the state acknowledges and adopts the conduct in question as its own.[16] Foreign Ministers represent their state's position internationally and their official statements may create international legal obligations binding on the state.[17] Kalvion's Minister of Foreign Affairs revealed that the interference with the control system was undertaken by Kalvion's cyber experts.[18] Since the Minister of Foreign Affairs acknowledged and adopted the cyber-operation on behalf of the statel in the official capacity, these actions are attributable to Kalvion.

2. Kalvion violated its international obligations

By committing the cyber-attack Kalvion violated the principle of peaceful uses of outer space (a), the principle of non-intervention (b) and its consultation obligation under Art. IX OST (c).

a. The cyber-attack is contrary to the peaceful uses of outer space principle

The customary principle of peaceful uses of outer space serves as a basis for contemporary space law and was enshrined[19] in numerous UNGA space resolutions.[20] UNGA Resolutions can constitute evidence of both elements of custom: general state practice[21] and *opinio juris*.[22] This custom was subsequently codified and detailed in Art. IV OST and Art. 3 MA.[23] Both of the treaties are binding upon Kalvion,[24] and Neapilia relies on these treaties to claim Kalvion's violations of the peaceful uses of outer space principle under Art. IV OST and Art. 3 MA.

i. Kalvion violated Art. 2(4) UN Charter, Art. IV OST and Art. 3(2) MA as the cyber-attack constitutes the use of force

According to Art. 2(4) UN Charter, all UN Members "shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations".[25] According to Art.

16 Art. 11 ARS; Concession des phares, p.198; Consular Staff, p.35
17 Watts/Foakes, p.1-2
18 Facts, para 33
19 WOLTER, p.10; LYALL/LARSEN, p.510
20 Res.1721(XVI); Res.1802(XVII); Res.1963(XVIII); Res.1962(XVIII)
21 S.W. Africa, p.291
22 Nicaragua, p.106-107
23 WOLTER, p.17, 21; LYALL/LARSEN, p.508; Tronchetti, p.332, 335
24 Facts, para 37
25 Art. 2(4) UN Charter

3(2) MA any threat or use of force on celestial bodies is prohibited.[26] According to Art. IV OST celestial bodies shall be used exclusively for peaceful purposes.[27]

Reference to the Purposes of the UN in Art. 2(4) means that the prohibition of threat or use of force serves not only to protect territorial integrity or political independence of a state,[28] but also applies to inter-state relations in outer space. Therefore, Art. 2(4) UN Charter, Art. IV OST and Art. 3(2) MA stipulate the same prohibition on the use of force in outer space. As ia evidenced by state practice, *i.e.* France stating in its reservation to MA, that it considers the prohibition under Art. 3(2) as a "reaffirmation" of the principle of non-use of force under UN Charter.[29] Thus, actions which constitute the use of force are in violation of all three of the above-mentioned provisions.

A cyber-operation constitutes a use of force when it has necessary scale and effects.[30] The criterion of "scale and effects" was used by the Court to qualify certain actions as an armed attack.[31] This criterion is also applicable to the qualification of cyber-operations as a use of force.[32]

The criterion of "scale and effects"[33] comprise several elements, four most relevant of which are considered below. Presence of any of the elements is sufficient for an action to be qualified as a use of force.[34]

First element: the cyber-operation qualifies as use of force when it significantly impacts the functioning of controlling technology, especially that of essential state system.[35] The control system of the "50 Rays Programme", attacked by Kalvion, was essential for Neapilia since the programme was the only means capable of resolving the overpopulation crisis, affecting Neapilia the most for 26 years and causing "widespread social rioting".[36] Irrevocably locking the control system of the programme[37] Kalvion significantly impacted controlling system of essential Neapilia's programme and therefore, committed an act of the use of force.

Second element: cyber-operations that result in kinetic effects of physical nature qualify as a use of force.[38] Kalvion's cyber-attack changed the mirrors'

26 Art. 3 MA
27 Art. IV OST
28 TM 2.0, p.329 (para 2)
29 UNTC
30 Roscini, p.242; Ziolkowsky, p.172-173; TM 2.0, p.330; Lin, p.73
31 Nicaragua, para 195
32 TM 2.0, p.331 (para 1)1
33 Ziolkowsky, p.173; TM 2.0, p.334-336
34 TM 2.0, p.333
35 Antolin-Jenkins, p.172 *shared by* Roscini, p.246; Lin, p.74;
36 Facts, para 6
37 Facts, para 31
38 Ziolkowsky, p.173

angle by 30°,[39] which can be qualified as kinetic effects of physical nature and therefore constituted the act of use of force.
Third element: cyber-operations that significantly impinge critical national interests qualify as a use of force.[40] While Neapilia was one of the countries most affected by the overpopulation crisis,[41] the programme intended to resolve its problems served Neapilia's vital national interest. By interfering with the programme, Kalvion impinged on Neapilia's critical national interests, committing an act of the use of force.
Fourth element: the operations whose effects are measurable and direct are qualified as a use of force.[42] Kalvion's cyber-attack was aimed directly at the functionality of OptronRay mirrors' control system and cyber-attack's effects (non-functionality of 2 mirrors and the control system) can be measured.[43]
Meeting four above-mentioned elements Kalvion's cyber-attack had necessary scale and effects to be qualified as the use of force in violation of Art. 2(4) UN Charter, Art. IV OST, Art. 3(2) MA.

ii. Even if the cyber-attack cannot be qualified as the use of force, it constitutes a hostile act in violation of Art. 3 MA

The wording of Art.3(2) MA prohibiting "any threat or use of force or any other hostile act or threat of hostile act" on celestial bodies[44] means that a use of force is but one of the possible hostile acts and there can be hostile acts that are less grave than a use of force.[45] Since MA lacks the definition of a "hostile act"[46] it must be interpreted in accordance with the ordinary meaning.[47] The ordinary meaning of the word "hostile" is "marked by malevolence, having an intimidating, antagonistic, or offensive nature".[48]
Kalvion's actions interfered with and ultimately locked Neapilian control system and changed mirrors' angle leading to the suspension of the Technology Trial,[49] thus depriving Neapilia of a chance to resolve global and national crisis. Even if not the use of force, such actions are malevolent, antagonistic, offensive and are qualified as hostile act.

39 Facts, para 30
40 TM 2.0, p.334 (para 9)
41 Facts, paras 6-7
42 TM 2.0, p.334-335 (para 9)
43 Facts, paras 28-30
44 Art. 3(2) MA
45 Zedalis, p.68
46 Zedalis, p.68
47 VCLT, Art. 31(1), applies to MA as customary norm: Genocide Case, para 160; Indonesia/ Malaysia, p.645-646; Botswana/Namibia
48 Merriam-Webster's; Burton's, p.315; Black's Law, p.806
49 Facts, paras 31-32

b. KALVION VIOLATED THE PRINCIPLE OF NON-INTERVENTION

The principle of non-intervention prohibits all states to intervene directly or indirectly in internal or external affairs of other states.[50] The Court stated several times that this principle is of customary nature,[51] as *opinio juris* in its respect is "numerous and not difficult to find".[52] Prohibited intervention must have two elements: affect matters of internal or external affairs and be coercive.[53]

i. Kalvion intervened in Neapilian internal affairs

Matters of internal affairs are matters in which each state is permitted "to decide freely", in particular on the "choice of political, economic, social system".[54] Kalvion intervened in Neapilian's attempt to resolve the overpopulation crisis, which caused widespread social rioting in Neapilia.[55] The choice of the lawful ways to resolve its social problems is the matter on which Neapilia is permitted "to decide freely", therefore by affecting such matters Kalvion intervened in Neapilia's internal affairs.

ii. The intervention was coercive

The use of force is always recognized to be coercive and to constitute an intervention.[56] As it was submitted above,[57] Kalvion's cyber-attack constitute use of force. Even if the cyber- attack is not qualified as a use of force, it is still coercive since in order to be coercive an act must deprive the state of its freedom of choice and force the state to refrain from acting in a particular way.[58] Kalvion's Minister of Foreign Affairs declared that Kalvion's cyber operation "would be maintained pending a declaration of the authorities of Neapilia that the '50 Rays' programme would be definitely abandoned".[59] This statement signifies that by committing the cyber-attack Kalvion indeed intended to coerce Neapilia to discontinue the Technology Trial and abandon the programme, *i.e.* to refrain from acting in a particular way. Since Kalvion's actions possess both elements of prohibited intervention Kalvion violated the non-intervention principle.

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50 Declaration on Friendly Relations, princ.3; Declaration on Rights and Duties; Nicaragua, para 205
51 Congo, paras 161-165; Nicaragua, para 202; Corfu Channel, p.35; Kohen, p.157
52 Nicaragua, para 202
53 Nicaragua, para 205; TM 2.0, p.314 (para 6); Kohen, p.161
54 Nicaragua, para 205
55 Facts, paras 6-7
56 TM 2.0, p.319 (para 22); Nicaragua, para 205
57 Memorial C.2.a.i
58 Declaration on Friendly Relations, princ.3, proved to be customary in Congo, para 162; TM 2.0, p.317 (para 18)
59 Facts, para 33

c. IN ANY EVENT KALVION VIOLATED CONSULTATION OBLIGATION UNDER ART. IX OST.

State must undertake international consultations if there is an activity or experiment planned by the state or its nationals (i); the state has reason to believe the activity or experiment would cause potentially harmful interference (ii); and it would potentially interfere with the activities of other states in the peaceful exploration and use of outer space (iii).[60] Kalvion's cyber-attack met all three criteria.

i. The cyber-attack was an activity planned by Kalvion

Kalvion warned Neapilia about the possibility to take "protection measures" before the cyber- operation was undertaken,[61] thus, Kalvion planned it.

ii. Kalvion had reason to believe the activity would cause potentially harmful interference

"Harmful interference" in space constitutes obstruction that is injuring, damaging or interfering with normal operation.[62] Physical interference is one of categories of harmful interference.[63] "Reason to believe" in Art. IX OST should be interpreted as having knowledge that proves the assertion that a planned activity would cause potentially harmful interference.[64]
Kalvion's actions locked Neapilian control system, having interfered with its functionality, and changed mirrors' angle, having physically interfered with mirrors' movement.[65] Therefore, Kalvion's actions constituted harmful interference. All these actions were made intentionally, therefore Kalvion was in full knowledge of their effects and therefore had reason to believe that they would cause potentially harmful interference.

iii. Kalvion's actions interfered with the activities of other states in the peaceful exploration and use of outer space

Neapilian activities were activities in peaceful exploration and use of outer space, as Neapilia did not commit any prohibited military actions, acting in full compliance with the provisions of Art. IV OST and Art. 3 MA.[66]
Thus, Kalvion had reason to believe that its actions would cause potentially harmful interference with activities of other states in the peaceful exploration and use of outer space, yet it did not undertake any international consultations, in breach of Art. IX OST.

60 Art. IX OST
61 Facts, para 29
62 Black, p.5; Mineiro, p.337 using Merriam-Webster's; Annex to ITU Convention
63 Mineiro, p.337
64 Mineiro, p.336
65 Facts, paras 31-32
66 Art. IV OST; Art. 3 MA

B. KALVION'S ACTIONS CANNOT BE QUALIFIED AS LAWFUL COUNTERMEASURES

Kalvion claims that its actions are "lawful countermeasures",[67] precluding wrongfulness of its act. However, Kalvion's cyber-attack cannot be qualified as lawful countermeasures since Neapilia did not commit any internationally wrongful act (1) and the cyber-attack does not meet the requirements of lawful countermeasures (2).

1. Neapilia did not commit any internationally wrongful act

A state may only take countermeasures against a state which is responsible for an internationally wrongful act.[68] Neapilia complied with its international obligations and, therefore, cannot be the target of countermeasures.

a. Neapilia complied with its obligation not to introduce adverse changes in Mars' environment under Art. 7(1) MA

States shall not disrupt the existing balance of celestial bodies' environment by introducing adverse changes.[69] Space environmental law cannot be considered separately from the concepts of terrestrial environmental law.[70] Changes in the Earth' environment in order to ensure human vital activities are introduced daily and are considered permissible, *i.e.*, industrialized farming causes 'acceptable' level of environmental harm.[71]
Changes of Mars' environment, intended to make Mars (the only planet with the needed potential)[72] suitable for human resettlement in the face of the global overpopulation crisis[73], do not qualify as adverse given that the alternative of not making such changes could threaten the future of the whole human population. Non-functionality of Kalvion's UMVs Mk-2[74] alone does not mean that the changes were adverse.
Thus, Neapilia complied with Art. 7(1) MA.

b. Neapilia complied with its obligation not to interfere with the activities of other states under Art. 8(3) MA

State's activities on celestial bodies shall not interfere with the activities of other states there.[75] Kalvion claims, that Neapilia's activities led to the cessation of communication between "Aeneas-1" and the UMVs Mk2.[76]

67 Facts, para 33
68 Art. 49(1) ARS; Gabčikovo-Nagymaros, para 83
69 Art. 7(1) MA
70 LYALL/LARSEN, p.275
71 HOLDER/LEE, p.78
72 Facts, para 8
73 Facts, para 19
74 Facts, paras 17,21
75 Art. 8(3) MA
76 Facts, paras 24,36

Firstly, the independent body of experts stated that the direct reasons of such cessation were the disturbances in the atmosphere and temperature conditions of Mars.[77] These disturbances were "*possibly*" caused by the deployment of the OptronRay mirrors,[78] however, they could have been caused by natural factors as well. For instance, dust storms are inherent environmental condition of Mars and they sometimes affect the whole planet.[79] Dust storms may be durable and severe, for example the one in September 1971 - January 1972 made it impossible for space probe "Mariner 9" to make photos of the surface of Mars.[80] Dust storms could affect UMVs functionality.[81]
Secondly, Kalvion itself declared that its mining system would only be non-functional if the whole "50 Rays" programme succeeds – that is when all 50 mirrors would be functional.[82] However, by the time of the cessation of communication with UMVs Mk-2 only two mirrors were deployed.[83]
Kalvion bears the burden of proving that Neapilia's actions were the reason of the cessation of communication between "Aeneas-1" and UMVs-2.[84] Since Kalvion can provide only experts' opinion that state just *"possible"* causality, causal link between Neapilia's actions and the cessation of communication cannot be decisively affirmed, and in the absence of such causality, Neapilia cannot be found in breach of Art. 8(3) MA.

c. NEAPILIA COMPLIED WITH ITS CONSULTATION OBLIGATION UNDER ART. IX OST

State must undertake international consultations if:

1) There is an activity or experiment planned by the state or its nationals;
2) The state has reason to believe that the activity or experiment would cause potentially harmful interference; and,
3) The interference must potentially interfere with the activities of other states in the peaceful exploration and use of outer space.[85]

Neapilia acted in accordance with Art. IX OST since it had no reason to believe that its actions would interfere with activities of other states. Art. IX

77 Facts, para 24
78 Facts, para 24
79 Martian Dust Storms
80 Mariner 9
81 Rucker, p. 84
82 Facts, para 21
83 Facts, para 19
84 Nicaragua Jurisdiction, para 101; Asylum Case, p.281
85 Art. IX OST

OST leaves the assessment of existence of reason to believe in potentially harmful interference to states' discretion due to three main reasons.
Firstly, Art. IX does not authorize any international body to assess whether there is "reason to believe".[86]
Secondly, since the OST was created as a treaty of proscriptive principles which cannot be interpreted by solely reviewing their text, state practice for the interpretation is needed.[87] *Thirdly*, state practice has yet to clearly establish the scope of the consultation obligation.[88] Therefore, Neapilia had the discretion to decide whether it has reason to believe in potentially harmful interference. Prior to its Technology Trial Neapilia assessed that there was no reason to believe that harmful interference would occur, since Kalvion's UMVs could work in harsh environmental conditions of Mars and Neapilia inferred that making these conditions milder and more Earth-like would not harm UMVs. Thus, Neapilia complied with its consultation obligation under Art. IX OST.

d. NEAPILIA COMPLIED WITH ITS OBLIGATION TO PAY DUE REGARD TO THE CORRESPONDING INTERESTS OF OTHER STATES UNDER ART. IX OST

States shall conduct their activities in outer space with due regard to the corresponding interests of other states.[89] "Due regard" does not impose a uniform obligation to avoid any impairment of other states' interests[90] and depends on the nature and importance of other states' interests as well as on the nature and importance of activities, affecting them.[91] Neapilia's activities were intended to resolve global crisis,[92] therefore they served the interests of all Humankind. The will of states to exercise special protection over the Humankind's interests is evidenced by the notions of *jus cogens*, *erga omnes* and the concept of "common heritage" in international law.[93] Kalvion's interests in mining Mars' resources for purely domestic use[94] weigh less than those of Humankind. Thus, conducting its Technology Trial Neapilia paid due regard to the corresponding interests of other states under Art. IX OST.

2. Kalvion's cyber-attack does not satisfy criteria of lawful countermeasures

To be lawful, countermeasures must satisfy each of the following criteria: countermeasures must not affect the obligation to refrain from use of force

86 Mineiro, p.351
87 Mineiro, p.352
88 Mineiro, p.352
89 Art. IX OST
90 Chagos, para 519
91 Chagos, para 519
92 Facts, paras 7,19,28
93 Villalpando, p.338, 400-406; Tanaka, p.333, 339; TRINDADE, p.4, 327
94 Facts, para 3

(a) as well as obligations under other peremptory norms of international law (b); countermeasures should be commensurate with the injury suffered (c). Also states should notify the responsible state of their decision to take countermeasures and offer negotiations (d). Kalvion's actions do not meet these requirements.

a. KALVION'S ACTIONS CONTRADICT CRITERION OF ART. 50(1)(A) ARS NOT TO AFFECT OBLIGATION TO REFRAIN FROM THE USE OF FORCE

Countermeasures cannot affect the obligation to refrain from the use of force.[95] Kalvion's actions constituted use of force,[96] therefore, they do not qualify as lawful countermeasures.

b. KALVION'S ACTIONS CONTRADICT ART. 50(1)(D) ARS NOT TO AFFECT OBLIGATIONS UNDER PEREMPTORY NORMS

Countermeasures cannot affect the obligations under peremptory norms.[97] Principle of non- intervention constitute peremptory norm of general international law.[98] Kalvion violated principle of non-intervention,[99] therefore Kalvion violated obligation not to affect peremptory norms.

c. KALVION'S ACTIONS ARE NOT COMMENSURATE WITH THE INJURY SUFFERED AS REQUIRED UNDER ART. 51 ARS

Countermeasures must be commensurate with the injury suffered.[100] Even if the cessation of communication between "Aeneas-1" and UMVs-2 was caused by Neapilia, it could lead only to the decrease of mining productivity but not to its full cessation, as UMVs-1 were autonomous and could work without communication with "Aeneas-1",[101] therefore Kalvion had the possibility to proceed with mining to resolve its resource crisis. Kalvion's cyber- attack led to the total loss of "50 Rays" programme and liquidation of SalPA Corp,[102] totally depriving Neapilia of the only possibility to resolve the crisis. Thus, Kalvion's countermeasures were not commensurate with the injury suffered.

95 Art. 50(1)(a) ARS; Declaration on Friendly Relations, princ.1; Corfu Channel, p.35; Nicaragua, para 249; S.C.Res.316; S.C.Res.111
96 Memorial I.C.2.a).i
97 Art. 50(1)(d) ARS
98 Sette-Camara sep.op., p.199; Dupuy, p.8; Macdonald, p.870
99 Memorial I.C.2.b)
100 Art. 51 ARS; Air Services, para 83; Gabčikovo-Nagymaros, paras 85,87; Territorial Jurisdiction, p.27
101 Facts, paras 17,18
102 Facts, para 32

d. KALVION FAILED TO FULFIL PROCEDURAL REQUIREMENTS UNDER ART. 52 (1)(B) ARS

Before taking countermeasures an injured state shall notify the responsible state of any decision to take countermeasures and offer to negotiate.[103] Kalvion neither notified Neapilia of the decision to take countermeasures nor offered negotiations. Kalvion did notify Neapilia of "protection measures",[104] which cannot be regarded as proper notification since protection measures do not equal countermeasures under ARS. "Countermeasures" is a well-established term of international law, whose main element is always non-performance of state's international obligation.[105] There is no established legal term "protection measures" in international law. For example EU in its official press-release used word 'to protect' in order to describe EU sanctions or "restrictive" measures.[106] And such measures do not constitute non-performance of state's international obligations,[107] contrary to countermeasures. Therefore, being notified of "protection measures" Neapilia could infer, that Kalvion was going to undertake some lawful responsive measures. Since Kalvion failed to duly notify Neapilia of countermeasures Kalvion violated its procedural obligation.

C. KALVION SHOULD BEAR RESPONSIBILITY FOR ITS INTERNATIONALLY WRONGFUL ACT

The state responsible for internationally wrongful act must cease it, offer guarantees of non- repetition and make full reparation for the injury.[108] Neapilia hereby asks the Court to recognize Kalvion's cyber-attack as an internationally wrongful act. Therefore, Kalvion should cease its cyber-attack and offer guarantees of its non-repetition. Kalvion is under the obligation to make restitution by restoring the functionality of Neapilia's control system and restoring mirrors' angle. All questions of compensation for the damage caused are considered below.[109]

II. KALVION IS LIABLE FOR THE TOTAL LOSS OF THE "50 RAYS" PROGRAMME AND FOR ALL CONSEQUENTIAL DAMAGES, LOSS OF PROFIT AND LIQUIDATION OF SALPA CORP.

Total loss of the "50 Rays" programme and consequential damages in the form of loss of profit and liquidation of SalPA Corp. constitute damage inflicted upon Neapilia, thus it has standing to bring the claim before the Court (A). Kalvion is liable for the total loss of the "50 Rays" programme as

103 Art. 52(1)(b) ARS; Air Services, paras 91,94-96
104 Facts, para 29
105 Art. 49 ARS; Commentary, para 6; Air Services, para 8
106 EU web-site
107 TFEU, Art. 215
108 Art. 30,31 ARS
109 Memorial, II

well as for all consequential damages under Art. III LIAB (B). Even if Kalvion is not liable under LIAB, it is liable under Art. VII OST (C). In any event, Kalvion is liable under general rules of international law (D).

A. NEAPILIA HAS STANDING BEFORE THE COURT

The Parties recognize the jurisdiction of the Court.[110] However, if the Respondent raises the issue of *jus standi,*[111] — the link allowing the state to bring the claim on precise legal rule,[112] the Applicant submits that it has standing both for the total loss of the "50 Rays" programme and consequential damages to SalPA Corp.

Under Art. I(a), III LIAB those states which suffered the loss or damage to their property possess *jus standi* to invoke liability.[113] Neapilia authorized SalPA Corp. to conduct the Technology Trial using the national civil space station and astronauts.[114] Neapilia owned 49% of SalPA Corp.'s (the company holding an international exclusive patent for OptronRay mirrors and HAMs' technologies) equity stake.[115] Moreover, the "50 Rays" programme served Neapilian national interest of solving global and national overpopulation crisis.[116]

The "50 Rays" programme consisted of several parts, each performing special functions:

1) OptronRay mirrors, warming Mars' surface,
2) "TheosAres", controlling the mirrors and
3) HAMs, designed to sustain life in new Mars conditions, subject to deployment after the success of the Technology Trial.[117]

The interconnectedness of all parts of the programme made it impossible to continue operations in a situation of damage to even one of its components.[118] Kalvion's actions brought to a halt operationality of the OptronRay mirrors.

In any event, the damage is inflicted to Neapilia as it was the shareholder of SalPA Corp. Thus, the total loss of the "50 Rays" programme, loss of profits and the liquidation of SalPA Corp. constitutes damage to Neapilia and it has standing before the Court.

110 Facts, para 37
111 Art.34(1) ICJ Statute; AMERASINGHE, p.117
112 Martínez, p.4
113 Dunk, p.90-91
114 Facts, paras 2,10,14
115 Facts, paras 12,14
116 Facts, para 7
117 Facts, paras 10-11
118 Facts, paras 11

B. KALVION IS LIABLE UNDER ART. III LIAB

Kalvion's liability is based on LIAB (2) and arises from damage caused by Kalvion (3). *Condiciones sine quibus non* of liability under Art. III LIAB are the damage caused in a place other than the surface of the Earth (3) by space object of one launching state (1) to space object of another launching state (2) due to the fault of the latter (4). As all the criteria for liability are met and Neapilia complied with LIAB procedure established for filing a claim on liability (5), Kalvion is liable.

1. Damage was caused to Neapilia's space objects

"TheosAres" and OptronRay mirrors are "space objects" (a) to which Neapilia is a launching state (b).

a. "TheosAres" and OptronRay mirrors are "space objects" within the meaning of Art. I(d) LIAB

The definition of a "space object" contained in Art. I(d) LIAB — "component parts of a space object as well as its launch vehicle and parts thereof" — is vague. A more precise definition that can be used as a means of interpretation of this treaty provision is contained in national space laws. It can be either object "launched or intended to be launched into outer space, including its components"[119] or even "launch vehicles, payloads, and any components thereof that are intended to go above 100 kilometers".[120] The doctrine describes a "space object" as "any man-made object which is at least attempted to be physically brought into outer space".[121] Both "TheosAres" and OptronRay mirrors are man-made objects launched into space,[122] therefore, they fall under the definition of "space objects".

b. Neapilia is a launching state of "TheosAres" and optronray mirrors under art. I(c) liab

Under Art. I(c) LIAB a "launching state" is the state "which launches or procures the launching of a space object" or a "State from whose territory or facility a space object is launched". This definition is identical to the definition given in Art. I(a)(i)(ii) RC for the purposes of national registration of space objects.
Neapilia launched and registered "TheosAres" and OptronRay mirrors,[123] thus, is qualified as the "launching state" thereof.

119 Art.2 Austrian Space Law
120 Part 2(8) Australian Space Law
121 Dunk, p.87
122 Facts, paras 2,9
123 Facts, para 2; Clarifications, para 13

2. Kalvion's control over "TheosAres" is equal to actions of the launching state

Though Kalvion did not launch "TheosAres", it exercised control over it and thus is liable. Space activities, including those involving cyber operations, are subject to the space law regime of liability[124]. It stems from the interpretation of the general rule of Art.VI OST, that "appropriate state" in terms of liability is the state able to control the object. To identify such state both: legal entitlement and factual capability must be evaluated.[125] General terms of Art. I(c) LIAB need evolutionary interpretation as treaties "of continuing duration" shall be presumed to designate such general terms of evolving meaning.[126] Once Kalvion committed the cyber-attack, Neapilia lost the factual capability to control the object, while Kalvion gained control over it and was *de facto* able to act as the "launching states".

Neapilia admits that it is formally the launching state in respect of "TheosAres" and OptronRay mirrors,[127] but emphasizes that the control over "TheosAres" was exercised by Kalvion when the damage was inflicted. By its cyber-attack Kalvion overtook OptronRay's control system and used it to change the angle of OptronRay mirrors,[128] inflicting damage upon Neapilian space objects. Thus, for the purposes of application of LIAB, Kalvion's actions qualify as the actions of the launching state.

3. Consequences of Kalvion's actions constitute damage within the meaning of Art.III LIAB

a. *The total loss of the "50 Rays" programme constitutes damage*

Loss of property of juridical persons[129] is "damage" within the meaning of Art.III LIAB. While LIAB does not specify the "loss", currently the ordinary meaning[130] of "loss" may be derived from state practice in the field of space insurance.[131] Space-leading countries like USA, France and the Netherlands have provisions in national space insurance laws regulating the concept of "loss",[132] while some European Union's states resort to general regulation on products' liability for the definition.[133] Thus, "total loss" means *inter alia* the impossibility to control an object by ground stations[134] and to use it for the

124 TM 2.0, Rule 60(b), p.281 (para 4)
125 STUBBE, p.265
126 Navigational Rights, para 66
127 Memorial II.A.2.a.ii
128 Facts, paras 30-31
129 Art. I(a) LIAB
130 Art.31(1) VCLT
131 Gaubert, p.911
132 Gaubert, p.91814-9201
133 EU Directive 1999/34/EC
134 Gaubert, p.934

arranged purpose.[135] As a result of Kalvion's cyber-attack, Neapilia *de facto* lost the possibility to control its space objects and use them in accordance with the original intention of implementing the programme.

A prerequisite of liability is the causal link between the action and damage, the assessment of which is based on criterion of foreseeability.[136] Kalvion foresaw the total loss of the "50 Rays" programme, *i.e.* the impossibility to control OptronRay mirrors, since the cyber-attack was committed by Kalvion with the sole purpose of forcing Nealipilia to "definitely abandon" the programme.[137] Thus, Kalvion is liable for the total loss of the "50 Rays" programme.

b. KALVION INFLICTED CONSEQUENTIAL DAMAGE

Damage, loss or injury, which flow not directly and from the act, but from its consequences or results — are recoverable under LIAB.[138] The damage is qualified as consequential if it is compensable. Compensation paid to restore "the condition which would have existed if the damage had not occurred" is determined "in accordance with international law" (Art.XII LIAB). The general rule provides that compensation covers any financially assessable damage including lost profits.[139]
Consequential damage in the form loss of profit (i) and liquidation of SalPA Corp. (ii) occurred as a result of Kalvion's cyber-attack.[140]

i. Kalvion is liable for the loss of profit of SalPA Corp.

Loss of profit, *i.e.* absence of anticipated increase of assets,[141] is consequential damage arising from existence of relations with third parties.[142] Contractual arrangements are the evidence of loss of profit, allowing its recovery.[143] This approach was confirmed during LIAB's drafting[144] and upheld by practice of the leading space nation, the USA, in *Martin Marietta v. INTELSAT case,* prescribing that lost profits are recoverable if that is established by applicable

135 Insuring Space Activities, p.8; Gould, p.53; Meredith, p.13
136 Commentaries to Art. 31 ARS, para 10; *Portuguese Colonies case*, p.1031; Carpanelli, p.6- 7; Christol, p.358-359
137 Facts, para 33
138 Christol, p.360; Diamond, p.668; Burke, p.282
139 Art. 36 ARS
140 Memorial II.A.2.b
141 EE&MC Compensation Loss of Profit, p.1; Commentaries to Art. 36 ARS, para 27
142 Ashley, p.264
143 Commentaries to Art. 36 ARS, para 27; *Cape Horn Pigeon case,* p.63; *Yuille Shortridge and Co. case*; *Sapphire International Petroleums,* p.187,189; *Factory at Chorzów,* p.47- 48,53; *LIAMCO case,* p.140
144 UN Doc A/AC.105/C.2/L.10, Art. II

treaty governing the relations.[145] This interpretation is a subsidiary means for determination of the rule of law under Art. 38(1)(d) ICJ Statute.
HAMs are integral part of the "50 Rays" programme to be deployed on Mars in 2063 after appropriate changes of the environment ensure "sufficient quantities of liquid water [...] on the surface",[146] therefore, suspension of the programme in 2056[147] led to the cessation of HAMs development and production. SalPA Corp. was approached "by a number of States and high net-worth individuals" willing to purchase HAMs "subject to successful demonstration of the first OptronRay mirrors during the Technology Trial"[148], yet execution of these purchase arrangements was rendered impossible after the cyber-attack. Therefore, the two criteria are met as there were contractual relations with anticipated profit and they were lost due to the cessation of the programme. Thus Kalvion is liable for the loss of profit of SalPA Corp.

ii. Kalvion is liable for the liquidation of SalPA Corp.

Liquidation of a company qualifies as financially accessible damage, subject to compensation.[149] Such damage is recoverable in space sector as consequential damages.[150] Moreover, when the damage is inflicted with intent, the court adjudicating the claim may arrange punitive damages as part of reparation.[151]
Liquidation of SalPA Corp. resulted from loss of profit due to the total loss of the "50 Rays" programme, which Kalvion intentionally caused by its cyber-attack and for which Kalvion is liable,[152] thus Kalvion is liable for the liquidation of SalPA Corp.

4. Kalvion is at fault

The term "fault" is neither defined by LIAB nor by state practice.[153] Thus, the Applicant resorts to LIAB's *travaux préparatoires*, which define "fault" as "willful or reckless act or omission",[154] the definition developed in the doctrine — "intent or negligence to cause damage in respect of someone else active in space"[155] and the notion of fault as "intention to harm" adopted in

145 *Martin Marietta Corp. v. INTELSAT*
146 Facts, paras 10-11
147 Facts, para 32
148 Facts, para 20
149 Art. 36(2) ARS; Commentaries to Art. 36 ARS, para 25; Saiga-2, para 175; Hedley v. Heller
150 Mosteshar, p.8
151 Palmisano, para 36; Wittich, para 44
152 Facts, para 32; Memorial III.B.3.a,c
153 Iridium 33 and Cosmos 2251 Collision
154 UN Doc A/AC.105/C.2/L.8/Rev.1, Art. II(2)
155 Dunk Liability, p.366; Smith, p.580 156

ARS.[156] Kalvion several times demanded the cessation of the "50 Rays" programme, including spearheading a high-level meeting and approaching the UN Security Council.[157] Not satisfied with the results, Kalvion committed the cyber-attack.[158] Kalvionian Minister of Foreign Affairs admitted the intent to ensure the termination and full abandonment of the "50 Rays" programme.[159] Thus, Kalvion is liable under Art. III LIAB.

5. Required procedure under LIAB is fulfilled

Neapilia complied with requirements to file the claim (a) and since the establishment of the Claims Commission is not mandatory (b), may invoke LIAB.

a. Neapilia presented its claim via diplomatic channels and within a one-year term after occurrence of damage

A claim for compensation of damage must be presented through diplomatic channels[160] within one year after the occurrence of damage.[161]
The cyber-attack, which caused the damage to the "50 Rays" programme, occurred in January, 2056.[162] At the same month SalPA Corp. was liquidated[163] and Neapilia protested against Kalvion's cyber-attack and entered into diplomatic consultations,[164] the result of which proved inconclusive.[165] In September 2056[166] Neapilia initiated the proceedings in the ICJ. Thus, Neapilia complied with the requirements to file a claim against Kalvion under LIAB.

b. Establishment of a Claims Commission is not mandatory

If a claim is presented through diplomatic channels, but was not resolved within one year, a Claims Commission shall be established.[167] However, the only case when LIAB was invoked as a ground for claim pointed the non-obligatory nature of the Commission's creation.[168]

156 Commentaries to Art.2 ARS, para 10
157 Facts, paras 23,25-26
158 Facts, para 30
159 Facts, para 33
160 Art.IX LIAB
161 Art.X(1) LIAB
162 Facts, para 30
163 Facts, paras 30,32
164 Facts, para 34
165 Facts, paras 30,34
166 Case Publication
167 Art.XIV LIAB
168 "Cosmos 954" case

This practice shall be taken into consideration for LIAB interpretation under Art. 31(3)(b) VCLT as subsequent practice of the application of the treaty[169]. Thus, having complied with necessary requirements, Neapilia may invoke LIAB as a basis of Kalvion's liability for damage.

C. EVEN IF LIAB IS NOT APPLICABLE, KALVION IS LIABLE UNDER ART. VII OST

Art. VII OST enshrines liability for damage caused by space objects, thus, constituting *lex generalis* for liability in the space, while LIAB rules are applicable as *lex specialis*.[170] However, Art. XXIII(1) LIAB specifies that it "does not affect other international agreements in force insofar as relations between the State Parties to such agreements are concerned".
Neapilia and Kalvion are parties to the OST and LIAB.[171] Therefore, even if LIAB is not applicable, liability for damage arises from Art. VII OST. While the damage (the total loss of "50 Rays" programme and consequential damage to SalPA Corp.) was inflicted by Kalvion,[172] the latter is liable under Art. VII OST.

D. IN ANY EVENT, KALVION IS LIABLE UNDER GENERAL RULES OF INTERNATIONAL LAW

A consequence of an international wrongful act is obligation to make reparation,[173] which may take a form of compensation if the damage is not made good by restitution.[174] Within the law of state responsibility the term "liability" is referred to as a duty to pay for all damages,[175]

i.e. pay compensation.

The ground for claim for compensation — international wrongful act or damage — is the only difference between ARS and LIAB. Consequently, compensation may be paid in a parallel with each other, if both grounds are met. Otherwise, discharge of compensation under LIAB does not preclude compensation under ARS.
As was shown above LIAB and ARS have identical rules on determination of damage and its compensation,[176] therefore, damage suffered by Neapilian is

169 Art. 31(3)(b) VCLT
170 LACHS, p.114
171 Facts, para 37
172 Memorial II.A.2.b
173 Art.31 ARS
174 Art.36 ARS; *Gabčíkovo-Nagymaros, para 152*
175 Commentaries to Art. 31 ARS, para 12 referred to T.Weir "Complex liabilities"; Commentaries to Art. 47 ARS, para 4; *Certain Phosphate Lands in Nauru, PO*, para 48; CRAWFORD, p.643
176 Memorial II.A.3.a,b

recoverable in a form of compensation.[177] Thus, Kalvion being responsible for an international wrongful act,[178] is under the obligation to pay compensation for all inflicted damages.

III. NEAPILIA IS NOT LIABLE FOR THE CESSATION OF KALVION'S MINING ACTIVITIES ON MARS

Kalvion may not invoke Neapilia's liability in relation to Kalvion's illegal mining activities on Mars (A). Even if Kalvion's mining activities on Mars are legal, Kalvion lacks standing to file a claim against Neapilia (B). Neapilia is not liable for the cessation of Kalvion's mining activities on Mars neither under Art. III LIAB (C), nor under Art. VII OST (D). In any event, Neapilia is not liable under general international law (E).

A. KALVION'S MINING ACTIVITIES ON MARS ARE ILLEGAL, THEREFORE, KALVION MAY NOT RAISE THE CLAIM OF NEAPILIA'S LIABILITY

Extraction of space resources by individual subjects of law amounts to their appropriation and is prohibited (1). Even if such activity is allowed, the sole purpose shall be scientific research but not commercial use (2). Thus, in any event, Kalvion's mining activities on Mars are illegal.

1. Kalvion's mining activities on Mars violate the non-appropriation principle

Neapilia relies on the *ex injuria jus non oritur* principle stipulating that states cannot benefit from an illegal act.[179] Art.II OST provides for an obligation of non-appropriation of the outer space, the Moon and celestial bodies. *Travaux préparatoires* reveal the content of the Art.II OST as prohibition of creating sovereignty and property rights in space.[180] In addition Art.11 MA provides for the status of natural resources in space as "common heritage of mankind" and prohibits establishment of property rights over them.

Private entities are allowed to carry out space activities once authorized by a state of nationality in conformity with Art.VI OST, which, consequently, implies that when a state is prohibited from conducting an activity it also cannot authorize a private entity to perform it.[181] "Resource extraction is a functional equivalent to appropriation"[182] and when states grant private entities property rights over space resources they exercise appropriation under Art.II OST "by any other means".[183] At the same time, in relation to

177 Memorial II.A.3.a,b
178 Memorial I.C,D
179 Eastern Greenland, p.45; Anzilotti dis.op., p.95; BROWNLIE, p.509
180 F.Tronchetti, p.3 referring to Pop
181 F.Tronchetti, p.3
182 Blount&Robinson, p.170
183 Blount&Robinson, p.166

private property rights, the OST "undercuts the ability of any government to recognize or enforce a private claim".[184] Contrary to its obligations under space law treaties, Kalvion authorized SIENAR to extract resources on Mars and further used it for domestic purposes,[185] which constitutes appropriation.

Thus, while Kalvion's mining activities on Mars were illegal, Kalvion cannot claim Neapilia's liability arising from its cessation. Even if mining activities on Mars are legal per se, Kalvion's mining activities on Mars violate the non-appropriation principle, as their purpose is not scientific research. Even presuming that mining and use of resources on Mars can be legal, the regime of such activities in absence of specially established rules under Art.11 MA shall be similar to regimes which govern resources of other common heritage of mankind areas.

While the management of resources of seabed and ocean floor and subsoil thereof, which have the status common heritage of mankind,[186] is regulated by International Seabed Authority,[187] it is relevant to consider Antarctica which does not have similar specific authority. Legal regime of Antarctica with its developments is considered to be that of common heritage of mankind.[188] The legal regime of explorative and exploitative activities of Antarctica resources are deemed to be conducted only with the view of scientific research purpose, not commercial use.[189]

Kalvion's mining activities were conducted for the purpose of resources supply,[190] therefore, are not scientific. Since Kalvion's mining activities on Mars are illegal, Kalvion is precluded from claiming Neapilia's liability for their cessation.

B. EVEN IF KALVION'S MINING ACTIVITIES ARE LEGAL, KALVION LACKS STANDING TO FILE A CLAIM FOR DAMAGE CAUSED TO SIENAR

State of nationality of juridical person, *i.e.* state of incorporation, may exercise diplomatic protection over the company.[191] Nevertheless, when a company is controlled or exercises its activities in a state other than the state of incorporation, the former is determined as the "state of nationality" for the purpose of diplomatic protection.[192] Irrespective of diplomatic protection,

184 Pop, p.278 referring to Silber K. "A little piece of heaven — space-based commercial development will happen sooner than you think. How a system of extraterrestrial property rights might emerge. Reason; November 1998"
185 Facts, paras 16-17
186 Art.136 UNCLOS
187 Art.153 UNCLOS
188 Keyuan, p.197
189 Tronchetti, p.806; Art. 7 Madrid Protocol
190 Facts, para 17
191 Art. 9 ADP
192 Art. 9 ADP; Commentaries to Art. 9 ADP, para 5

Art. XI(2) LIAB allows juridical persons to pursue a claim directly against LIABle state.

Firstly, though SIENAR was established in Kalvion, it is a multinational company.[193] SIENAR specializes in cutting age space technologies and is linked with Kalvion only through the provision of products of its activities.[194] However, acknowledging multinational character of SIENAR and lacking information about other SIENAR's activities, determination of Kalvion as "state of nationality" for diplomatic protection is precluded.

Secondly, being a developed country,[195] Neapilia has efficient legal system providing for accessible means of legal redress. It is SIENAR that developed UMVs, launched and deployed them and "Aeneas-1" on Mars and its orbit[196] and allegedly suffered damage from the cessation of mining activities on Mars. Moreover, SIENAR is still conducting its activities. Cumulatively, SIENAR not Kalvion has standing to present the claim for damage due to the cessation of mining activities on Mars.

C. NEAPILIA IS NOT LIABLE UNDER ART. III LIAB

Even if Kalvion may invoke LIAB, Neapilia is not liable under Art. III as the necessary criteria are not met (1). Regardless of fulfillment of criteria under Art. III LIAB, Neapilia is not liable as Kalvion did not comply with procedure of filing the claim (2).

1. Even if Kalvion may invoke LIAB, Neapilia is not liable under Art. III

As was stated above, liability under Art. III LIAB arises if cumulative criteria are met: the damage is caused to space object of one state by space objects of other launching state due to the fault of the latter.[197] While space activities are conducted by means of space objects, damage to respective space objects amounts to the damage to space activities.

Neapilia indeed qualifies as the launching state of space objects "TheosAres" and OptronRay mirrors.[198] However, Neapilia did not inflict damage to Kalvion's objects (a). Even if the damage was caused by Neapilia, it was neither foreseeable (b) and nor led to the cessation of Kalvion's mining activities (c). In any event, the absence of Neapilia's fault gives no rise to liability (d).

193 Facts, para 16
194 Facts, para 16
195 Facts, para 2
196 Facts, paras 16-18
197 Memorial II.2,3.c
198 Memorial II.A.2.a.ii

a. NEAPILIA DID NOT INFLICT DAMAGE TO KALVION

Activities of Kalvion's space objects "Aeneas-1", UMVs-2 on Mars' surface (i) and flights of cargo ships (ii) taken in conjunction, form "Kalvion mining activities on Mars" and neither of which were damaged by Neapilia.

i. Neapilia did not inflict damage to Kalvion's "Aeneas-1" and UMVs-2

Neapilia admits that in the context of space objects functionality, electronic or laser interference may amount to damage.[199] Nevertheless, an obligation to make reparation and compensation arises only when the causal link between the action of the state and the damage suffered by the other party from it is established[200] and LIAB is applicable to damage with an adequate causality.[201] "A degree of certainty" shall be provided[202] for the Court to pronounce on LIABility for damage.

While the Respondent claims that the only possible reason for the cessation of the mining activities are Neapilia's actions, it fails to consider other possible reasons for changes in the environment, for instance, dust cycles, including storms.[203]

Taking this into consideration the reasoning that the "loss of communication" occurred "due to disturbances in the atmosphere" only "possibly" caused by Neapilia's programme,[204] the loss can be equally attributed to a dust storm, and, therefore, the causal link between Neapilia's actions and the cessation of mining activities of missing.

ii. Neapilia did not inflict consequential damage to Kalvion's natural and juridical persons

As was submitted above,[205] in accordance with the definition given in the doctrine "consequential damage" means either damage or loss arising from the consequences of injury, which main characteristic is link to the act.[206]

The termination of Kalvion's cargo flights between the Earth and Mars resulted from the cessation of mining activities on Mars.[207] While Neapilia is not liable for respective cessation,[208] Neapilia is also not liable for termination of Kalvion's supply flights with Marcian resources.

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199 Dunk, p.85; Smith&Kerrest, p.111,114-115,126-129,174-175; HURWITZ, p.50, 53-54
200 Commentaries to Art. 31 ARS, para 9; Commentaries to Art. 36 ARS, para 5
201 Kerrest & Thro, p.67 referring to UN Doc A/AC.105/C.2/SR.103 (1968)
202 Corfu Channel, Merits, p.17
203 Memorial I.B.1.b)
204 Facts, para 24
205 Memorial II.3.b)
206 Christol, p.360; Diamond, p.668; Foster, p.158
207 Facts, para 24
208 Memorial for the Applicant, III B 2 (a),(b)(i)

B. THE DAMAGE WAS UNFORESEEABLE

The test for the causal link between the act and damage covered by liability is the test of its foreseeability.[209] The damage to Kalvion's space objects and the consequent cessation of Kalvion's mining activities could not have been anticipated in a term of 15 month after the beginning of the Technology Trial for several reasons. Firstly, UMVs-2 has been considered as reliable mining technology with an operational lifetime of 5 years.[210] When the Technology Trial began, only 1,5 year of UMVs-2 operational lifetime has past.[211] Secondly, the most recoverable mineral resources on Mars are of volcanic origin and are concentrated in craters,[212] not in polar areas where OptronRay mirrors were functioning. Finally, a satisfactory change of Mars environment was anticipated ten years after the programme's launch — only by 2063 and only after the second generation of larger mirrors is deployed for a three-year term.[213]

Thus, merely beginning to perform the Technology Trial with first generation of smaller mirrors on Mars poles, Neapilia could not foresee the damage to Kalvion's space objects having long operational lifetime and being situated in other areas of Mars. Therefore, Neapilia is not liable for the cessation of Kalvion's mining activities.

C. EVEN IF THE DAMAGE WAS CAUSED BY NEAPILIA, IT DID NOT LEAD TO THE CESSATION OF KALVION'S MINING ACTIVITIES ON MARS

Kalivon insists that cessation of its mining activities on Mars resulted from the loss of communication between "Aeneas-1" and UMVs-2, "possibly" caused by deployment of OprtonRay mirrors.[214]

Assuming *arguendo* that the deployment of OptronRay mirrors could interfere with the communication of "Aeneas-1" and UMV's-2, still that is functionality aspect of the satellite, but not the UMVs technology as such. Kalvion mining activities were successfully conducted without any supporting satellite for 5 years prior to the deployment of "Aeneas-1".[215] Therefore, Neapilia could decrease the amount of mined resources to the level of 2048-2051,[216] if Kalvion uses UMVs-1 once again, but the cessation of Kalvion's mining activities on Mars as a whole was not caused by Neapilia's actions. Thus, Neapilia is not liable for respective cessation.

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209 Carpanelli, p.6-7; Christol, p.358-359; Commentaries to Art. 31 ARS, para 10; *Portuguese Colonies case*, p.1031
210 Facts, paras 17-18,23
211 Facts, paras 18-19
212 NASA Scientists Discover Unexpected Mineral on Mars
213 Facts, para 11
214 Facts, para 24
215 Facts, para 17
216 Facts, para 17

D. IN ANY EVENT, NEAPILIA ACTED DILIGENTLY AND THE DAMAGE TO KALVION'S MINING ACTIVITIES WAS INFLICTED IN THE ABSENCE OF NEAPILIA'S FAULT

As was previously indicated, "fault" for the purposes of Art. III means intent or negligence.[217] While Neapilia's "50 Rays" programme had the sole intent of solving the global overpopulation crisis "for the benefit and welfare of all Humankind",[218] the criterion of "intent" in respect of fault is not met.
"Negligence", as referred to during LIAB's drafting, means "full knowledge that the damage will probably result".[219] Absence of negligence is proved by actions in conformity with due diligence principle,[220] *i.e.* taking by responsible government diligent steps to achieve desired result.[221] According to customary "no harm" rule states informed about existence of a danger, are obliged to give necessary notification,[222] and take precautionary measures to prevent harm, at least to give warning to avoid and abate harmful effects.[223] "Obligations of prevention"[224] are obligations of conduct, not the result.[225] In order to solve national and global overpopulation crisis, in absence of any collective solution, Neapilia has been looking for a space-based solution since 2030.[226] The OptronRay operation was of no danger to Mars or any activity on it and was announced before Kalvion started mining activities on Mars.[227] Neapilia fulfilled procedures prescribed by space law treaties and kept the public updated on the programme's performance.[228] Thus, Neapilia acted diligently and cannot be found at fault and thus liable.

2. Regardless of merits of liability under Art. III LIAB, Neapilia is not liable as Kalvion did not comply with procedure of filing a claim

Kalvion failed to present the claim for damage via diplomatic channels (a) and within one year from the occurrence of damage or identification of launching state (b), thus, is not eligible to file a claim before the Court. The Applicant admits that establishing a Claims Commission is not mandatory.[229]

217 Memorial II.A.3.c
218 Facts, paras 4,19,28
219 Mazaroff, p.90
220 Palmisano, para 23; Koivurova, paras 1, 4
221 Koivurova, paras 1, 3
222 Corfu Channel, p.22; Koivurova, para 3
223 Sucharitkul, p.831
224 ILC Report1999, para 178
225 Ibid; HANQIN, p.165; Koivurova, para 8
226 Facts, paras 4, 5, 7
227 Facts, paras 9, 10,17
228 Facts, paras 15, 19
229 Memorial II.A.3.d.ii

a. KALVION DID NOT COMPLY WITH THE REQUIREMENT OF PRESENTING A CLAIM VIA DIPLOMATIC CHANNELS

According to Art. IX LIAB the claim for compensation for damage must be presented via diplomatic channels or through the Secretary General of the United Nations if states do not maintain diplomatic relations. Neapilia and Kalvion have maintained diplomatic relations and earlier Kalvion contacted Neapilia to request cessation of the "50 Rays" programme prior of damage occurrence.[230] However, when Kalvion's activities suffered damage, allegedly caused by Neapilia, Kalvion did not resort to diplomatic channels to present respective claim to Neapilia before filing a claim to the Court, thus, may not invoke Neapilia's liability under LIAB.

b. KALVION FAILED TO MEET THE TIME-LIMIT REQUIREMENT FOR PRESENTING A CLAIM

The claim for damages must be presented within one year from the moment of inflicting damage or identification of LIABle state.[231]
Kalvion insists that damage to its mining activities on Mars occurred in March 2054 due to Neapilian space activities,[232] which signifies that the occurrence of the damage and identification of LIABle state by Kalvion took place around that time. However, the claim for liability was raised by Kalvion after January 2056,[233] with a delay of approximately two years.
Thus, failing to comply with the time limit for filing the claim, Kalvion is not eligible to present it before the Court.

D. NEAPILIA IS NOT LIABLE UNDER ART. VII OST

As was stated above, if the state is not liable under Art. III LIAB, it may still be liable under Art. VII OST.[234]
Nevertheless, the criterion of "damage" must be met. As Neapilia's space objects did not inflict damage to Kalvion's ones,[235] Neapilia is not liable for cessation of Kalvion's mining activities on Mars.

E. IN ANY EVENT, NEAPILIA IS NOT LIABLE UNDER GENERAL INTERNATIONAL LAW

As the Applicant has stated above, liability as duty to compensate for damage may arise as a consequence of an internationally wrongful act.[236]
While Neapilia complied with its obligations,[237] no obligation of compensation to Kalvion for the cessation of Kalvion's mining activities on Mars arises.

230 Facts, para 23
231 Art.X(1) LIAB
232 Facts, para 24; Clarifications, para 16
233 Facts, paras 34-36
234 Memorial II.B
235 Memorial III.A.2.a,b
236 Memorial II.C
237 Memorial I.D.1

ARGUMENT OF RESPONDENT, THE REPUBLIC OF KALVION

I. KALVION'S ACTIONS CONSTITUTED AN UNLAWFUL CYBER-ATTACK AGAINST NEAPILIA, CONTRARY TO INTERNATIONAL LAW AND TO THE PEACEFUL USES OF OUTER SPACE

A. EXISTING INTERNATIONAL LAW APPLIES TO CYBER-OPERATIONS

According to the decision of the PCIJ in Lotus "restrictions upon the independence of States cannot…be presumed."[1] The decision gave rise to the *Lotus principle* holding that when there are no rules of international law, states are free to act at their discretion and when it is unclear whether norms apply, their application is never presumed.[2] The Court has already based its decisions on this principle.[3] "Where there is State will, there is international law: no will, no law."[4] States have not yet expressed their will with regard to the public international legal regulation of inter-state cyber-operations.[5] The existing documents only touch upon cyber activities by private individuals, not inter-state cyber activities[6]. Cyber-operations have taken place in international relations: operation against Iranian nuclear facilities,[7] cyber-operations in Estonia,[8] cyber-conflict in Kosovo.[9] However, states did not express their will to consider such actions as violation of international law. As neither states' will nor cyber-specific norms exist, states are free to act at their discretion in cyberspace.

B. KALVION'S ACTIONS CANNOT BE QUALIFIED AS A CYBER-ATTACK

The Applicant claims that Kalvion's actions constitute a cyber-attack.
There is no "cyber-attack" definition in the cyber-related Council of Europe's Conventions,[10] European Union acts,[11] UN General Assembly resolutions.[12]

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1 Lotus, p.18
2 Handeyside, p.79
3 Nicaragua, para 269, analyzed by Handeyside, p.86; Kosovo, para 84, analyzed by Hertogen, p.902-903;
4 Pellet, p.22
5 TM 2.0, p.3
6 Convention on Cybercrime; Convention on Automatic Processing; AP to Cybercrime Convention, Regulation 2016/679; Directive 2016/680; Directive 2016/1148; Directive 2013/40/EU
7 Stuxnet
8 Estonia 2007
9 Kosovo Conflict
10 Convention on Cybercrime; Convention on Automatic Processing; AP to Cybercrime Convention
11 REGULATION 2016/679; DIRECTIVE 2016/680; DIRECTIVE 2016/1148; DIRECTIVE 2013/40/EU

Domestic cybersecurity and data protection legislation of different countries[13] also lack definition of a "cyber-attack". Attempts to define a cyber-attack at the international level have been unsuccessful.[14] It logically follows that there was no necessity for states to mark out the term of "cyber-attack" and in the absence of state will this notion lacks legal contents. Though there exist several doctrinal definitions,[15] in the absence of state will it is impossible to deduce legal one .

Even if it is possible to accept the doctrinal definition of Tallinn Manual 2.0, which is reflected in other sources,[16] Kalvion's actions do not qualify as a cyber-attack. According to this definition, cyber-attack is a cyber-operation towards objects that is reasonably expected to cause damage or destruction to objects.[17] The majority of Tallinn Manual experts do not qualify the interference with functionality, which does not require the replacement of physical components, as damage to the object.[18] To restore the functionality of Neapilia's control system it was only required to install a new system,[19] not to replace its physical components, therefore, Kalvion's cyber-operation did not cause damage. Thus, in any case Kalvion's actions cannot be qualified as a cyber-attack.

C. EVEN IF EXISTING INTERNATIONAL LAW APPLIES TO CYBER ACTIVITIES, KALVION'S CYBER-OPERATION WAS LAWFUL AS IT CONSTITUTED LAWFUL COUNTERMEASURES

An injured state may take countermeasures against the state responsible for an internationally wrongful act.[20] Kalvion has the right to resource mining on Mars (1). Neapilia committed several internationally wrongful acts that injured Kalvion's right (2). Kalvion's countermeasures in response to Neapilia's internationally wrongful acts satisfy the criteria of countermeasures lawfulness (3).

1. Kalvion has the right to resource mining on Mars

Kalvion recognizes that under the *ex injuria jus non oritur* principle state cannot benefit from an illegal act,[21] thus the issue of Kalvion's compliance

12 Res.55/63; Res.56/121; Res.57/239; Res.58/199; Res.64/211; Res.53/70; Res.67/27; Res.69/28; Res.70/237
13 Information Technology Act; Cybercrimes Bill; Data Protection Act; Cybercrime Act; Cybersecurity Bill; Online Crime Act
14 Hathaway/Crootof, p.824
15 TM 2.0, p.415; Hathaway/Crootof, p. 826; Lin, p.63
16 Report 31IC/11/5.1.2, p.37; Memorandum for Chiefs, p.5; Military Dictionary; NATO Glossary, p.2-C-11
17 TM 2.0, p.415
18 TM 2.0, p.417 (para 10)
19 Facts, para 31
20 Art. 49(1) ARS; Gabčikovo-Nagymaros, para 83
21 Eastern Greenland, p.45; Anzilotti dis.op., p.95; BROWNLIE, p.509

with its space law obligations shall be examined. Kalvion's mining activity is lawful since there is no direct prohibition on such activity in international space law (a) and in the absence of *lex specialis* prohibition, selective approach to different outer space resource types is impermissible(b).

a. THERE IS NO DIRECT PROHIBITION ON RESOURCE MINING ON CELESTIAL BODIES IN INTERNATIONAL SPACE LAW

Art.II OST provides for an obligation of non-appropriation of the outer space, the Moon and celestial bodies while Art.11 MA, *lex specialis* to OST provisions, provides for status of natural resources in space as "common heritage of mankind" and prohibits establishment of property rights over them *in place*.[22] These provisions do not contain prohibition on the use of resources, while the prohibition of the appropriation extends only to resources *'in place'*.[23] In the absence of a specific provision prohibiting extraction of resources, it "can be interpreted as a valid "use" under general international law" in an outer space context.[24] Moreover, exploitation of natural resources in space is an "allowable use of outer space and celestial bodies", which does not contradict Art.II OST and is not affected by the MA.[25] State practice supports this approach.[26] Thus, Kalvion is not prevented by *lex specialis* norms from the resource extraction on Mars.

b. SELECTIVE APPROACH TO DIFFERENT OUTER SPACE RESOURCE TYPES IS IMPERMISSIBLE

Resources of the outer space *sticto sensu* such as orbits are daily used by states, and these activities are not considered as appropriation of outer space contrary to Art. II OST. The selective approach to legal regime of various types of space resources is impermissible: while orbits are used by states for their own purposes, mineral resources on celestial bodies can be extracted and used as well.[27] Thus Kalvion has a right to mining activity on Mars.

2. Neapilia committed several internationally wrongful acts that injured Kalvion's right

A state may only take countermeasures against a state responsible for an internationally wrongful act.[28] An action or omission constitutes an internationally wrongful act when it is attributable to a state and constitutes a

22 Art. II OST; Art. 11 MA
23 Blount&Robinson, p. 172-173; Doyle, p.315-316; Man, p.17-18
24 Blount&Robinson, p.172
25 Man, p.17-18
26 US Space Act 2015, para 51303; Luxembourg Space Resources Act 2017, Art. 1
27 Man, p.27
28 ARS, Art. 49(1)

breach of its international obligation.[29] Activities intended to change Mars' environment are attributable to Neapilia (a) and violated its international obligations (b-f).

a. ACTIONS OF SALPA CORP. ARE ATTRIBUTABLE TO NEAPILIA

States shall bear international responsibility for national activities in the outer space carried out by non-governmental entities.[30] Authorization and supervision of activities in space by the appropriate state is the criterion of their determination as "national".[31] Neapilia authorised SalPA Corp. to carry out the Technology Trial, held a 49% equity stake in the company and supervised the Trial,[32] therefore SalPA Corp.'s actions are attributable to Neapilia.

b. NEAPILIA VIOLATED THE OBLIGATION NOT TO DISRUPT THE EXISTING BALANCE OF MARS' ENVIRONMENT UNDER ART. 7(1) MA

States shall not disrupt the existing balance of celestial bodies' environment by introducing adverse changes in the environment.[33] Space environmental law cannot be considered separately from the concepts of terrestrial environmental law.[34] The adversity of environmental effects is assessed based on the adverse effects for Humankind[35], for example assessing social and health impact is a standard component of the Environmental Impact Assessment.[36] These are the states themselves that decide what is considered adverse for the international community.

Heads of states collectively representing nearly 9/10 of the Earth's population declared that environmental conditions of Mars should remain unaltered.[37] Therefore, it can be concluded that 9/10 of the Earth's population recognize changes to Mars' environment to be adverse.

Given such unanimous opinion of the states on the matter, Neapilia's actions qualify as "adverse" in violation of Art. 7(1) MA.

29 ARS, Art. 2; Phosphates in Morocco, p.28; Consular Staff, p.29; Gabčikovo-Nagymaros, p.54
30 Art. VI OST applies as *lex specialis* to ARS
31 STUBBE, p.260
32 Facts, paras 14,15,19,28
33 Art. 7(1) MA
34 Lyall/Larsen, p.275
35 LOUKA, p.6
36 VIIKARI, p.262
37 Facts, para 25

c. NEAPILIA VIOLATED THE OBLIGATION NOT TO INTERFERE IN THE ACTIVITIES OF OTHER STATES ON MARS UNDER ART. 8(3) MA

State's activities on celestial bodies shall not interfere with the activities of other states there.[38] The independent body of experts stated that the cessation of communication between Kalvion's equipment was caused by the disturbances in the atmosphere and temperature conditions of Mars, which were possibly caused by the deployment of the OptronRay mirrors.[39] Despite the fact that experts' opinion stated probable causal link between Neapilia's programme and cessation of communication, the facts here should be applied cumulatively, which provides that preponderance of evidence leads to the necessary degree of certainty. Firstly, there were only two countries conducting operations on Mars. Secondly, Kalvion had had its mining activities for 5 years by the time communication ceased, and for these 5 years no changes in Mars atmosphere occurred making mining impossible.[40] Thirdly, the purpose of the "50 Rays" programme was to change environmental conditions of Mars,[41] moreover the communication between 'Aeneas-1' and UMVs Mk-2 ceased precisely after the Trial has started.[42] Thus the preponderance of evidence supported by all the above-mentioned facts points at a higher probability of the causal link between Neapilia's actions and cessation of communication rather than natural factors and cessation of communication. Thus, Neapilia has violated Art. 8(3) MA by interfering in the activities of Kalvion.

d. NEAPILIA VIOLATED ITS CONSULTATION OBLIGATION UNDER ART. IX OST

State must undertake international consultations if: there is an activity or experiment planned by the state or its nationals (i); the state must have reason to believe the activity or experiment would cause potentially harmful interference (ii); and, the activity would potentially interfere with the activities of other states in the *peaceful* exploration and use of outer space (iii).[43]

i Technology Trial was an activity planned by Neapilia

"50 Rays" programme was planned by SalPA Corp. and endorsed by Neapilia. The Technology Trial was part of the programme[44] so the first requirement is met.

38 Art. 8(3) MA
39 Facts, para 24
40 Facts, paras 17-24
41 Facts, para 9
42 Facts, para 24
43 Art. IX OST
44 Facts, paras 9,10

ii Neapilia had reason to believe the activity would cause potentially harmful interference

The criterion of having a "reason to believe" in Art. IX OST should be interpreted as having knowledge that proves the assertion that a planned activity would cause potentially harmful interference.[45] "Harmful interference" in space constitutes obstruction that is injuring, damaging or interfering with normal operation.[46]
Neapilia was expressly warned by Kalvion that their UMVs will be non-functional in new environmental conditions,[47] therefore Neapilia had necessary knowledge. Neapilia's Trial interfered with UMVs' normal operation, which constituted harmful interference.

iii Neapilian activity interfered with the activities of other states in the peaceful exploration and use of outer space

Restrictions on military uses of outer space prohibiting nuclear weapons and weapons of mass destruction, use of force or hostile acts and some specified forms of military activities in outer space and on celestial bodies are stated in Art. IV OST and Art. 3 MA[48]. Kalvion's mining activities were in compliance with the above-mentioned provisions, thus they qualify as peaceful exploration and use of outer space.
Therefore, Neapilia had reason to believe that its actions would cause potentially harmful interference with the activities of Kalvion in the peaceful uses of Mars and, nevertheless, Neapilia did not undertake any international consultations, violating Art. IX OST.

e. NEAPILIA VIOLATED THE OBLIGATION TO PAY DUE REGARD TO THE CORRESPONDING INTERESTS OF OTHER STATES UNDER ART. IX OST

States shall conduct all their activities in outer space with due regard to the corresponding interests of other states.[49] The extent of "due regard" depends on the nature and importance of other states' interests as well as on the nature and importance of activities affecting those interests.[50] The "50 Rays" programme affected both Kalvion's vital interests of continuing mining activities and interests of other states in preserving Mars atmosphere unaltered.
Kalvion has suffered "longer and more severely than other states from the depletion of Earth's resources"[51] and its mining activity had already proved

45 Mineiro, p.336
46 Black, p.5; Mineiro, p.337 using Merriam-Webster's; Annex to ITU Convention
47 Facts, para 23
48 Tronchetti, p.332
49 Art.IX OST
50 Chagos, para 519
51 Facts, para 3

to be a "long-term viable solution" for Kalvion's problems.[52] Neapilia might claim that its interests of continuing the Trial were of predominate importance since the programme was intended to be a global, not a domestic solution. However, nothing would impede Kalvion's ability to share its effective technology with other countries suffering the consequences of the global crisis. The "50 Rays" programme, on the contrary, was merely at the stage of trial, the results of which were yet to be reported. Neapilia's Trial damaged precisely the radio waves communication between "Aeneas-1" and UMVs-2, while all Earth's radio communication technologies have the same functioning, [53] it means that Neapilia deprived all Humankind from the possibility to use such radio waves communication on Mars in the future.

The will of states to exercise special protection over the objects of common interest is evidenced by the notions of *jus cogens*, *erga omnes* and the concept of "common heritage" in international law.[54] Preserving Mars atmosphere according to the will of 9/10 of the Earth population is in the line with the recognition of Mars as the object of common heritage of mankind.[55] Neapilia's Trial damaged precisely the radio waves communication between "Aeneas-1" and UMVs-2, while all Earth's radiocommunication technologies have the same functioning, [56] it means that Neapilia deprived all Humankind from the possibility to use such radio waves communication on Mars in the future. Despite Kalvion's warning that its mining technology would be non-functional in new environmental conditions[57] and contrary to the expressed will of global community to preserve Mars atmosphere[58], Neapilia proceeded with the Trial in blatant disregard of the interests of both Kalvion and the majority of other states thus failing to pay due regard to the interests of other states in violation of Art. IX OST

Nevertheless Neapilia proceeded with the Trial which was intended to cause changes in Mars atmosphere[59].

3. Kalvion's countermeasures satisfy the criteria of countermeasures lawfulness

To be lawful countermeasures shall not affect particular obligations (a), shall be commensurate with the injury suffered (b) and be reversible (c). Before taking countermeasures states should call upon the responsible state to fulfil its obligations and notify of their decision to take countermeasures (d).

52 Facts, para 18
53 NASA Communication
54 Villalpando, p.338, 400-406; Tanaka, p.333, 339; TRINDADE, p.4, 327
55 Art. 11(1) MA
56 NASA Communication
57 Facts, para 23
58 Facts, para 25
59 Facts, para 24

Kalvion's actions meet all these requirements, therefore they can be qualified as lawful countermeasures.

a. KALVION'S COUNTERMEASURES COMPLIED WITH ART. 50(1) OF ARS NOT TO AFFECT PARTICULAR OBLIGATIONS

Countermeasures shall not affect: the obligation to refrain from the threat or use of force (i); obligations under peremptory norms of general international law (ii); obligations for the protection of fundamental human rights and obligations of humanitarian character prohibiting reprisals (iii) .[60]

i. Kalvion's cyber-operation does not constitute the use of force complying with Art. 2(4) of the UN Charter, Art. IV OST and Art. 3(2) MA

According to Art. 2(4) of the UN Charter, all UN Members "shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any State, or in any other manner inconsistent with the Purposes of the United Nations".[61] According to Art. 3(2) MA any threat or use of force on celestial bodies is prohibited.[62] According to Art. IV OST celestial bodies shall be used exclusively for peaceful purposes.[63] Reference to the inconsistency with the Purposes of the UN in Art. 2(4) means that any threat or use of force is illegal, not only against territorial integrity or political independence,[64] thus, this norm applies, inter alia, to outer space. Art. 2(4) of the UN Charter, Art. IV OST and Art. 3(2) MA stipulate the same prohibition on the use of force in outer space. Such approach is supported by France that, in its reservation to the MA, states that it considers the prohibition under Art. 3(2) as nothing but a "reaffirmation" of the principle non-use of force under UN Charter.[65] Thus, actions qualified as the use of force are in violation of all three of the above-mentioned provisions.

A cyber-operation constitutes use of force when it has necessary *scale and effects*.[66] The Court used the criterion of "scale and effects" when qualifying actions as an armed attack[67] and it can be equally applied when qualifying cyber actions as use of force.[68] Most relevant element for the evaluation of "scale and effects"[69] is a physical damage to the objects.[70] Moreover, the level

60 Art. 50(1) ARS; Declaration on Friendly Relations, princ.; Corfu Channel, p.35; Nicaragua, para 249; S.C.Res.316; S.C.Res.111;
61 Art. 2(4) UN Charter
62 Art. 3 MA
63 Art. IV OST
64 TM 2.0, p.329 (para 2)
65 UNTC
66 Roscini, p.242; Ziolkowsky, p.172-173; TM 2.0, p.330; Lin, p.73
67 Nicaragua, para 195
68 TM 2.0, p.331 (para 1)1
69 Ziolkowsky, p.173; TM 2.0, p.334-336

of destruction must be significant.[71] State practice evidences that even when Stuxnet cyber-operation caused 1000 machines to physically degrade,[72] no state claimed it was the use of force.

Kalvion's actions locked Neapilian control system,[73] rendering it non-functional. Non- functionality cannot be considered as physical damage, since the system's physical condition remained unaltered, whereas physical damage usually consists of destruction of the object or of its part.[74] Therefore, Kalvion's operation did not meet the main element of physical damage and thus Kalvion's actions do not raise to the level of the use of force in their scale and effects.

ii. Kalvion complied with peremptory norms of general international law, in particular, the non-intervention principle

Kalvion's cyber-operation did not affect its obligations under peremptory norms of general international law.

The Applicant may argue that in particular, the principle of non-intervention was violated. The principle of the non-intervention prohibits all states to intervene directly or indirectly in internal or external affairs of other states.[75] The Court stated several times that this principle is of customary nature,[76] as *opinio juris* in its respect is "numerous and not difficult to find".[77] Principle of non-intervention constitute peremptory norm of general international law.[78] Prohibited intervention has two elements: it affects matters of internal or external affairs and it is of coercive nature.[79]

Firstly, Kalvion did not intervene in internal or external affairs of Neapilia. "Internal affairs" are affairs "not, in principle, regulated by international law".[80] Actions intended "to compel another State into compliance with its international obligations" cannot be qualified as intervention.[81] Neapilia disrupted Mars environment,[82] which led to the cessation of Kalvion's mining activities[83] in breach of Neapilia's international obligations under space

70 Roscini, p.242; TM 2.0, p.333 (para 8); Ziolkowsky, p.173;
71 Koh, p.4
72 Stuxnet
73 Facts, para 31
74 Ziolkowsky, p.173; Koh, p.4; Roscini, p.242
75 Declaration on Friendly Relations, princ.3; Declaration on Rights and Duties; Nicaragua, para 205
76 Congo, paras 161-165; Nicaragua, para 202; Corfu Channel, p.35; Kohen, p.157
77 Nicaragua, para 202
78 Sette-Camara sep.op., p.199; Dupuy, p.8; Macdonald, p.870
79 Nicaragua, para 205; TM 2.0, p.314 (para 6); Kohen, p.161
80 Nationality Decrees, p.24
81 TM 2.0, p.317 (para 15)
82 Facts, para 28
83 Facts, para 24

treaties.[84] Hence, these affairs are regulated by international, not domestic law. Kalvion's cyber-operation being intended to compel Neapilia into compliance with its international obligations does not affect matters of internal or external affairs.

Secondly, Kalvion's actions were not coercive. In order to be coercive an act must deprive the state of its freedom of choice; force the state to act in an involuntary manner[85] and cause such effects directly.[86] Even if internal affairs of Neapilia were affected, such impact was not directly caused by Kalvion's cyber-operation. SalPa Corp. itself made the decision to go bankrupt and the officially stated reason for the suspension of the programme was the fact that mirror technology could not be demonstrated to the satisfaction of the clients,[87] not the fact that the suspension was forced by Kalvion's actions. Since there is no direct causal link between Kalvion's actions and effects on Neapilia's policies, the element of coercion is absent.

Lacking two necessary elements, Kalvion's actions do not constitute intervention in violation of peremptory norm of general international law.

iii. Kalvion's countermeasures did not affect other international obligations under Art. 50(1) ARS.

Kalvion's countermeasures did not affect obligations for the protection of fundamental human rights and obligations of a humanitarian character prohibiting reprisals, therefore, Kalvion complied with Art. 50(1) ARS.

b. THE COUNTERMEASURES COMPLIED WITH ART. 51 ARS AS THEY WERE COMMENSURATE WITH THE INJURY SUFFERED

The countermeasures must be commensurate with the injury suffered, taking into account the gravity of the internationally wrongful act and the rights in question.[88] Rights in question for both, Neapilia and Kalvion, were the rights to conduct their space programmes aimed at resolving the crisis. Neapilia's internationally wrongful act led to the full termination of Kalvion's mining activities on Mars,[89] thus, Kalvion totally lost the opportunity to solve its resource crisis. Kalvion's cyber-operation locked Neapilia's Trial control system, so that Neapilia also lost the opportunity to resolve the crisis, which can be regarded as commensurate with the injury suffered by Kalvion. Moreover, the functionality of Neapilia's system can be restored.[90]

84 Memorial I.B.1
85 Declaration on Friendly Relations, princ.3; TM 2.0, p.317 (para 18)
86 TM 2.0, p.320 (para 24)
87 Facts, para 32
88 Art. 51 ARS; Air Services para 83; Gabčikovo-Nagymaros, paras 85,87 Territorial Jurisdiction, p.27
89 Facts, para 24
90 Facts, para 31

c. KALVION COMPLIED WITH ART. 49(3) ARS AS ITS COUNTERMEASURES ARE REVERSIBLE

Countermeasures shall, as far as possible, be taken in such a way as to permit the resumption of performance of the obligations in question.[91] Restoration of Neapilia's control system was possible by the reinstallation of a new control system.[92] Since the restoration of the functioning is possible, the countermeasures are reversible complying with Art. 49(3).

d. KALVION COMPLIED WITH THE OBLIGATION TO FULFIL PROCEDURAL REQUIREMENTS UNDER ART. 52 (1) ARS

Before taking countermeasures an injured state shall call upon the responsible state to fulfil its obligations, notify it of the decision to take countermeasures and offer to negotiate.[93] However, if countermeasures are urgent and necessary to preserve state's rights, a state has the right not to notify and offer negotiations.[94] Kalvion called upon Neapilia to fulfil its obligations before taking countermeasures.[95] However, Kalvion had the right not to notify Neapilia of countermeasures since countermeasures were urgent and necessary to preserve Kalvion's right to use Mars' resources, as environmental intervention had the potential of spoiling Mars' atmosphere to such an extent that mining would be impossible.

Moreover, an injured state has the right not to notify a responsible state when the countermeasures are necessary to preserve the right to take countermeasures themselves.[96] This exactly applies to the contemporary technologies of communications, when countermeasures undertaken by cyber-means could be also prevented by cyber-means promptly after the notification, which makes the procedure of notification frustrating for the purpose of countermeasures.[97] Kalvion had the right to undertake urgent cyber-countermeasures since Neapilia could prevent cyber-operation by cyber-means promptly after notification. Thus, Kalvion complied with procedural requirements under Art. 52(1) ARS and its countermeasures were lawful.

II. KALVION IS NOT LIABLE FOR ANY DAMAGE RELATING TO THE INTERRUPTION OF THE "50 RAYS" PROGRAMME NOR FOR ANY CONSEQUENCE ON SALPA CORP.

Neapilia has no standing to file the claim against Kalvion (A). Even if Neapilia has standing, Kalvion is not liable under Art. III LIAB (B) and Art.

91 Art. 49(3) ARS; Gabčikovo-Nagymaros, para 87
92 Facts, para 31
93 Art. 52(1)(a)(b) ARS; Air Services, paras 91,94-96
94 Art. 52(2) ARS
95 Facts, para 23
96 Art. 52 ARS, Commentary para 6
97 Art. 52 ARS, Commentary para 6

VII OST (C). In any event, Kalvion is not liable under general rules of international law (D).

A. NEAPILIA HAS NO STANDING TO FILE A CLAIM UNDER THE LIAB

The Court may reject to hold the proceedings on a claim irrespective of having jurisdiction.[98] While the Respondent does not contest the Court's jurisdiction in the present case,[99] itt submits that Neapilia has no *jus standi*,[100] the link allowing a state to bring a claim on precise legal rule,[101] in respect of the loss of "50 Rays" programme (1) and damages of SalPA Corp. (2).

1. The damage to "50 Rays" programme was not caused to Neapilia

States are liable for damage inflicted on space objects elsewhere than surface of the Earth.[102] Enterprises with 50,01% or more of equity stake owned by a state are state-owned.[103]
The owner of the objects within the "50 Rays" programme was private Neapilian company SalPA Corp.[104] Neapilia owned only 49% in SalPA Corp.'s equity stake,[105] thus, the alleged damage was caused solely to SalPA Corp itself. While the damage was not inflicted on Neapilia, it has no standing to bring the claim for liability against Kalvion.

2. Neapilia cannot invoke diplomatic protection of SalPA Corp.

Jus standi of juridical persons may be exercised by a state of its nationality[106] which is determined by a place of incorporation and state of "permanent and close connection".[107] However, special rules of Art. XI(2) LIAB entitle juridical persons to pursue a claim directly to an allegedly liable state or via their state of nationality. Therefore, the existence of the juridical person under concern is a prerequisite for filing the claim.
By the moment of filing the claim, SalPA Corp. was liquidated.[108] Thus, Neapilia, that no longer constitutes a state of incorporation or state of close

98 Rosenne, p.589
99 Facts, para 37
100 Art. 34(1) ICJ Statute; AMERASINGHE, p.117
101 Martínez, p.4
102 Art. III LIAB
103 Kowalski, p.19-20
104 Facts, paras 8-9
105 Facts, para 14
106 Art. XI(2) LIAB; MCCORMICK, p.259
107 Art. 9 ADP; Commentaries to Art. 9 of ADP, para 3; Barcelona Traction, para 71
108 Facts, para 32

connection to SalPA Corp., lacks standing neither under diplomatic protection nor under Art. XI(2) LIAB.

B. KALVION IS NOT LIABLE UNDER ART. III LIAB

Condiciones sine quibus non of liability under Art. III LIAB are the damage caused in a place other than the surface of the Earth by space object of one launching state to space object of another launching state due to the fault of the latter. The alleged damage to Neapilian space objects was not caused by space objects launched by Kalvion but via a cyber operation (1) and occurred between space objects of one launching state (2). Consequences of Kalvion's operation did not result in damage within the meaning of Art.III LIAB (3) and Kalvion is not at fault (4). Thus, Kalvion is not liable under Art. III LIAB.

1. Kalvion's cyber operation does not equal actions of a launching state

While both Parties have ratified the LIAB,[109] it is only applicable to damage to space objects of one launching state by space objects of the other launching state inflicted either on the surface of the Earth, to the aircraft in the flight or on the place other than the surface of the Earth (as deduced from the preamble, articles, object and purpose under the rules of treaty interpretation).[110]

Pursuant to the definition of a "launching state" under Art. I(c) LIAB, it is the state "which launches or procures the launching of a space object" or a "State from whose territory or facility a space object is launched". This definition is identical to the definition for the purposes of national registration of space objects.[111]

The alleged damage occurred in a place other than the surface of the Earth, however, it did not occur due to the interaction of space objects of two launching states, one damaging the other. Proceeding from the ordinary meaning of the term "launching state" under the general rule of treaty interpretation[112], a state undertaking a cyber-operation does equal a state registering and launching objects into space. The alleged damage was inflicted by Kalvion's cyber-operation from the Earth,[113] not by space objects in respect of which Kalvion qualifies as a "launching state". Thus, Kalvion's cyber operation does not equal actions of a launching state and falls manifestly outside of the LIAB's scope of application.

109 Facts, para 37
110 Art. 31 VCLT
111 Art. I(a)(i)(ii) RC
112 Art. 31(1) VCLT
113 Facts, paras 30-31

2. The alleged damage was caused by to OptronRay mirrors by "TheosAres" to both of which Neapilia is a launching state

Notwithstanding Rule 60 of the Tallinn Manual 2.0, providing for liability of a state controlling a space object launched by another state and using it to further inflict damage to a space object launched by yet another state, still Kalvion's alleged control over a space object falls outside of the described space liability regime since both "TheosAres" and OprtonRay mirrors were launched by Neapilia.

Pursuant to the definition of a "launching state" under Art. I(c) LIAB, being the state "which launches or procures the launching of a space object" or a "State from whose territory or facility a space object is launched" and given that these definitions are identical to the definition for the purposes of national registration of space objects,[114] Neapilia is the "launching state" of "TheosAres" and OptronRay mirrors since it registered them.[115]

The damage to OptronRay mirrors was inflicted by "TheosAres".[116] Therefore, the damage occurred between space object of the same, not different launching state's objects, thus the LIAB is not applicable.

3. Consequences of Kalvion's actions did not result in damage within the meaning of Art.III LIAB

Kalvion's actions did not result in the loss of the "50 Rays" programme (a) or consequential damages to SalPA Corp. in the form of loss of profits and liquidation (b). Thus, the criterion of "damage" under Art. III LIAB is not met.

a. KALVION'S ACTIONS DID NOT CAUSE THE LOSS OF THE "50 RAYS" PROGRAMME

The causal link between acts of a state and damage therefrom is the necessary element to impose liability upon such state.[117] The LIAB does not specify the exact contents of "loss", yet the concept of "loss" may be derived from state practice in the field of space insurance[118] of such countries as USA, France and the Netherlands, having the definition in field-specific laws [119] and some European Union's states resorting to general regulation on products' liability for the definition.[120] Following the adopted practice, "loss" means *inter alia* the impossibility to control an object by ground stations.[121] "Total" loss of

114 Art. I(a)(i)(ii) RC
115 Facts, para 2; Clarification, para 13
116 Facts, para 33
117 Commentary to Art. 31 ARS, para 9
118 Gaubert, p.911
119 Gaubert, p.91814-9201
120 EU Directive 1999/34/EC
121 Gaubert, p.934

the programme also implies that elements of a programme are to be lost completely, not partially.
In the present case, the possibility to exercise control over OptronRay mirrors was not lost, but "locked"[122] until the time when a new control system is installed.[123] Moreover, the only damage that occured *in casu* - that is, change in the angle of two smaller OptronRay mirrors deployed for the Technology Trial[124], is not equivalent to the "total" loss of the "50 Rays" programme as whole. The "indefinite suspension" of the "50 Rays" programme was a strategic corporate decision of SalPA Corp,[125] not the immediate result of the change of the mirrors' angle. When announcing its decision to suspend the "50 Rays" programme, SalPA Corp. stated the inability to continue the program as the reason for the decision[126] and made no reference to Kalvion's actions as the cause of the suspension.
While in order to determine whether the programme was lost, the history of contractual arrangements and dealings may be taken into consideration.[127], contracts with "inherently speculative elements" are not subject to compensation.[128]
In casu none of contracts for HAMs was concluded and some anticipated buyers only approached SalPA Corp., orders and contracts being pending.[129] Even though Kalvion's actions could have an impact on the "50 Rays" programme,[130] it was suspended by SalPA Corp.'s decision, as "the technology could not be demonstrated to the satisfaction of clients".[131] That was the reason for cancellation of HAMs contracts.[132]
Thus, the decision to discontinue the "50 Rays" programme does not flow from Kalvion's actions. The absence of a causal link between Kalvion's actions and the "total loss" of the "50 Rays" programme gives no rise for Neapilian claims towards Kalvion.

b. KALVION'S ACTIONS DID NOT CAUSE CONSEQUENTIAL DAMAGES TO SALPA CORP.

Damage that does not flow directly and from the act, but from its consequences may be recoverable under LIAB.[133] However, the means of

122 Facts, 31
123 Facts, 31
124 Facts, 10, 11
125 Facts, 32
126 Facts, 32
127 Commentary to Art. 36 ARS, para 27; WHITEMAN, p.1837
128 Commentary to Art. 36 ARS, para 27; Amco Asia Corporation 1984, 1986, 1990; AGIP SpA case
129 Facts, paras 20, 32
130 Facts, para 33
131 Facts, para 32
132 Facts, para 32
133 Christol, p.360; Diamond, p.668; Burke, p.282

qualifying the damage as consequential is evaluation of whether such damage is compensable. Under Art.XII LIAB compensation paid to restore "the condition which would have existed if the damage had not occurred" is determined "in accordance with international law".
Neither loss of profit of SalPA Corp. (i) nor liquidation of SalPA Corp. (ii) qualify as compensable consequential damage to Neapilia.

ï Kalvion is not liable for the loss of profit of SalPA Corp.

Loss of profits is subject to compensation only when sufficient evidence shows that income was anticipated.[134] The evidence of loss of profit, allowing its recovery, is the existence of contractual arrangements.[135]
While SalPA Corp. was approached by a number of States and high net-worth individuals willing to purchase HAMs "subject to successful demonstration of the first OptronRay mirrors during the Technology Trial"[136], the willingness to conclude a contract by no means constitutes a contract itself. Loss of potential buyers' interest in purchasing any products, HAMs included, is part of market risks any business entity bears, SalPA being no exception.
Thus, evidence showing that income was anticipated and then lost due to Kalvion's actions, is insufficient to trigger Kalvion's liability for the loss of profits of SalPA Corp.

ii Kalvion is not liable for the liquidation of SalPA Corp.

For SalPA Corp. liquidation to be compensated under the LIAB, the Applicant would have to prove that it occurred as a result of Kalvion's actions. SalPA Corp. was a powerful private Neapilian company with an historical interest in innovative technology[137], present in the highly risky space activities market for at least a decade.[138] Yet it filed for bankruptcy shortly after the change in the angle of two of the OptronRay mirrors[139], used just for the first stage of the "50 Rays" programme - the Technology Trial.[140]
There is no sufficient evidence that such corporate decision of an experienced business entity was the result of Kalvion's actions. Thus, Kalvion may not be held liable for SalPA Corp.'s liquidation.

134 Commentary to Art. 36 ARS, para 27
135 Commentaries to Art. 36 ARS, para 27; Cape Horn Pigeon case, p.63; Yuille Shortridge and Co. case; Sapphire International Petroleums, p.187,189; Factory at Chorzów, p.47-48,53; LIAMCO case, p.140
136 Facts, 20
137 Facts, 8
138 Facts, 9
139 Facts, 32
140 Facts, 10

4. Kalvion is not at fault

The "fault" as a criterion of state liability under Art. III LIAB means an act or omission[141] resulting either from intent or negligence.[142] The LIAB was drafted and adopted long before ARS and at that time the notion "fault-liability" was equal to "responsibility", while the result of an internationally wrongful act was considered to be a legal connection between the guilty, offending State and the injured State.[143] Understanding of "responsibility" as a consequence of wrongful act and "liability" as compensation for damage from non-prohibited activity came with ARS.[144]

Firstly, Kalvion's intent was to defend its access to space resources[145] by means of countermeasures, not to inflict damage to Neapilia. Secondly, ARS codifies countermeasures as circumstances precluding wrongfulness,[146] thus implying the absence of "international wrongful act" for the purposes of Art. III LIAB. Kalvion committed lawful countermeasures,[147] thus it is not at fault.

C. KALVION IS NOT LIABLE UNDER ART. VII OST

Art. VII OST enshrines liability for damage caused by space objects of one state to space objects of another state, thus constituting *lex generalis* for liability in the space while the LIAB serves as *lex specialis*.[148] If the liability of a state is not entailed under applicable *lex specialis*, including absence of "fault", no liability arises under Art. VII OST.[149] In such cases parties shall bear their own losses *i.e.* in Irridium-33 and Cosmos 2251 Collision.

Neapilia and Kalvion are parties to LIAB and OST.[150] Kalvion's liability neither arises under the LIAB nor OST. Thus Kalvion is not liable neither for the interruption of "50 Rays" programme nor for consequential damages of SalPA Corp under neither LIAB nor OST.

D. IN ANY EVENT, KALVION IS NOT LIABLE UNDER GENERAL INTERNATIONAL LAW

The term "liability" is also used to describe a duty to pay for damages arising from a wrongful act,[151] *i.e.* pay compensation. The Respondent admits that a

141 Mazaroff, p.90
142 Dunk Liability, p.366; UN Doc A/AC.105/C.2/L.8/Rev.1, Art. II(2)
143 Ago Second Report, para 22; Ago Third Report, para 35
144 Sucharitkul, p.834; General Commentary to ARS, para 4.c
145 Facts, paras 23, 26, 36
146 Art. 22 ARS
147 Memorial I.D
148 Lachs, p.114; Smith, p.586
149 Smith, p.586
150 Facts, para 37
151 Commentaries to Art. 31 ARS, para 12 referred to T.Weir "Complex liabilities"; Commentaries to Art. 47 ARS, para 4; Certain Phosphate Lands in Nauru, PO, para. 48

state which committed an internationally wrongful act is obliged to make compensation.[152]

However, Kalvion resorted to countermeasures, which preclude wrongfulness of its actions.[153] Indeed, Art. 27(b) ARS provides for compensation of material loss caused by an act whose wrongfulness is precluded. Nevertheless, this compensation is strictly limited to direct loss.[154] While Neapilia did not suffer direct damage, but invokes Kalvion's liability for the damage, caused to its juridical person,[155] compensation under Art. 27(b) ARS may not take place.

Thus Kalvion being not responsible for an international wrongful act[156] and taking lawful countermeasure[157] without direct material loss to Neapilia[158] has no obligation to pay compensation for damage relating to "50 Rays" programme and SalPA Corp.

III. NEAPILIA IS LIABLE FOR THE CESSATION OF KALVION'S MINING ACTIVITIES ON MARS

Kalvion has standing to file the claim (A). Neapilia is liable for the cessation of Kalvion's mining activities on Mars under Art. III LIAB (B). Even if Neapilia is not liable under Art. III LIAB, it is liable under general international law (C).

A. KALVION HAS STANDING TO PRESENT THE CLAIM FOR DAMAGE INFLICTED TO SIENAR

Under general rules of diplomatic protection the criterion of incorporation prevails in determination of the nationality state eligible to exercise it,[159] and is supplemented by "permanent and close connection" criterion,[160] established by considering the place of business activities.[161] The LIAB, binding upon Neapilia and Kalvion, is applicable in the present case as *lex specialis* to the rules on diplomatic protection. The LIAB does not prescribe exhaustion of local remedies as a requirement for presentation of claim by a state on behalf of its juridical persons.[162]

152 Art.36 ARS; Gabčíkovo-Nagymaros, para 152
153 Art. 22 ARS
154 Commentary to Art. 27 ARS, para 4; CRAWFORD, p.218
155 Memorial II.A.1.a
156 Memorial I.C
157 Memorial I.D
158 Memorial II.A.1.a
159 Art. 9 ADP; Commentaries to Art. 9 ADP, para 6
160 Commentaries to Art. 9 ADP, para 3; Barcelona Traction, para 71
161 Art. 9 ADP; Commentaries to Art. 9 ADP, para 5
162 Art. XI(1) LIAB

SIENAR was incorporated in Kalvion.[163] For eight years, SIENAR exploited space resources of Mars for domestic purposes[164] under authorization byof Kalvion's national law.165[165] Kalvion is a place of SIENAR's business activities. Unlike SalPA Corp.,, SIENAR continues to exist.[166] Thus while the corporation is functional and the two criteria – incorporation and close connection – are fulfilled, Kalvion has standing to present the claim for cessation of SIENAR's mining activities on Mars in the current proceedings.

B. NEAPILIA IS LIABLE UNDER ART. III LIAB

The LIAB is applicable to damage to Kalvion's mining activities on Mars (1). Neapilia is liable as it inflicted damage due to fault (2) and as Kalvion complied with established procedure to file the claim (3).

1. The LIAB is applicable as Neapilia inflicted damage to Kalvion's space objects

As was stated above,[167] the LIAB is applicable if the damage is caused by space objects of one launching state to space objects of another launching state. Neapilia inflicted damage to Kalvion's space objects (a) by its space objects (b), thus the LIAB is applicable.

a. KALVION'S "AENEAS-1" AND UMVS-2 FALL UNDER THE DEFINITION OF A "SPACE OBJECT"

Definition of "space object" is discussed above.[168] Aforementioned allows to define any object launched into space as "space object". "Aeneas-1" and UMVs-2, being launched into space[169] fall under the definition of "space object" and, thus, Neapilia shall be found liable for the damage caused to them.

b. NEAPILIA QUALIFIES AS THE "LAUNCHING STATE" OF SPACE OBJECTS "THEOSARES" AND OPRTRONRAY MIRRORS

States launching space objects in outer space and celestial bodies are liable for the damage caused by such objects towards other States.[170] "TheosAres" and OptronRay mirrors are defined as space objects[171] in respect of which Neapilia is qualified as launching state,[172] thus the LIAB is applicable.

163 Facts, para 16
164 Facts, paras 17-18
165 Facts, para 16
166 Facts, para 32; Memorial II.A.I.b)
167 Memorial II.A.2
168 Memorial II.A.2.a)
169 Facts, paras 17-18
170 Art. VII OST; Art.II, Art.III LIAB
171 Memorial II.A.2.a
172 Memorial II.A.2.b

2. Neapilia is liable under Art. III LIAB for damage inflicted by fault on Kalvion's mining activities on Mars

Art. III LIAB states criteria for the incurrence of the liability: damage and fault. Since the damage was inflicted by Neapilian space objects (a), what led to the cessation of Kalvion's mining activities on Mars (b) due to Neapilia's fault (c), Neapilia is liable for respective damage.

a. Neapilia's space objects inflicted damage to Kalvion's space objects

Launching states are liable for the damage caused to other states' space objects elsewhere than on the surface of the Earth.[173] Activities of Kalvion's space objects: "Aeneas-1" at the polar orbit, UMVs-2 on Mars' surface (i) and flights of cargo ships (ii), taken in conjunction, constitute "Kalvion's mining activities" on Mars that suffered damage.

i. Neapilia damaged the functioning regime of Kalvion's "Aeneas-1" and UMVs-2 by conducting "50 Rays" programme

According to Art. I(a) LIAB damage means either damage or loss of property. More detailed definition of damage to a space object can be found in the doctrine[174] introducing notion of indirect damage caused by a space object without direct physical collision,[175] for example, by electronic or laser interference,[176] which may be consequential aspect of space activity.[177] The loss of property is damage, which cannot be restored and that is "causally linked to the damage caused by the space object".[178]
Kalvion's satellite "Aeneas-1" had been deployed in the polar orbit of Mars to communicate with UMVs-2[179] 19 months before the deployment of OptronRay mirrors.[180] The consequent alteration of Mars environment, including modifications in the temperature and pressure on the surface of Mars, led to the interruption of communication between the "Aeneas-1" and UMVs-2.[181] Thus rendering UMVs-2 unfitted for their primary tasks.[182] The mentioned alterations could not be eliminated until Neapilian "50 Rays" programme is terminated.[183] Consequently, Neaplia is liable for damage to Kalvion's property ("Aeneas-1" and UMVs-2).

173 Art.III LIAB
174 Art. 38(1)(d) ICJ Statute
175 Christol, p.362; Carpanelli, p.3; Lalin, p.306
176 Dunk, p.85
177 Carpanelli, p.3
178 Smith, p.587
179 Facts, para 18
180 Facts, para 19
181 Facts, para 24
182 Facts, para 21
183 Facts, paras 21, 24

ii. Neapilian actions inflicted consequential damage on Kalvion's natural and juridical persons

Launching states whose actions cause damage to natural or juridical persons, are liable for respective activities.[184] Since the LIAB does not specify what actions and consequences therefrom constitute "damage to persons" the treaty is to be interpreted under Art. 31(4) VCLT.[185] *Travaux préparatoires* for the LIAB show that the scope of "damage" was supposed to include "judicial legal costs and interest"[186] and "loss of profits and moral damage", if the latter is in conformity with national law of respective liable state.[187] Thus "damage" is not limited to direct damage and may include consequential damages — either damage, loss or injury flowing from consequences of the act.[188]

Kalvion was suffering longer and more severely than other states from the depletion of Earth's non-renewable natural resources.[189] In the search of a solution SIENAR, company established in Kalvion, was authorized to exploit space resources,[190] for the benefit of Kalvion's population. Since the end of 2049 Kalvion cargo spaceships returning to the Earth were provided with necessary space resources.[191] The capacity of mining increased in March 2051 providing a long- term viable solution for Kalvion's domestic energy crisis.[192] Neapilia's actions not only damaged Kalvion's space objects, but led to the cessation of all mining activities and delivery of space resources to Kalvion.[193] Thus loss of profits and moral damage occurred to Kalvion's natural and juridical persons, including SIENAR, for which Neapilia is liable.

b. Damage caused by Neapilia led to the cessation of Kalvion's mining activities on Mars

Causal link between the act of the State and injury suffered by the other State is essential for obligation of reparation to arise.[194] "Damage" for the purposes of Art. III LIAB is understood as "loss of or damage to property".[195] Interference with Kalvion's mining activities on Mars by Neapilia constituted damage which could not be restored and prolongation of mining activities in

184 Art.I, Art.III LIAB
185 Carpanelli, p.5
186 UN Doc A/AC.105/12, An.1, Art. 1(b)
187 UN Doc A/AC.105/C.2/L.10, Art. II
188 Christol, p.360
189 Facts, para 3
190 Facts, para 16
191 Facts, para 17
192 Facts, para 18
193 Facts, paras 3
194 Commentaries to Art. 31 ARS, para 9; Commentaries to Art. 34 ARS, para 1
195 Art.I(a) LIAB

new Mars' environmental conditions therefrom was impossible and ceased. Respective cessation occurred as Kalvion's UMVs-2 lost the communication with "Aeneas-1", which function was to control UMVs-2' operations and reveal Mars' resources for mining.[196] Despite Kalvion's repeated efforts, the communication was not restored.[197] Moreover, even if Kalvion managed to fix the communication, the prolongation of mining activities was impossible — new Mars environmental conditions created by Neapilia would make UMVs-2 unfit for their function,[198] that has been already proven in practice by the loss of communication between "Aeneas-1" and UMVs-2 at the beginning of the Mars environmental intervention.[199] Therefore, mere restoration of the communication will not re-establish the previous situation. Proceeding with mining activities at the same state[200] would still be impossible since Neapilia has expressly refused to stop the process of Mars environmental intervention,[201] what led to the cessation of Kalvion's mining activities for which Neapilia is liable. Consequently, Neapilia is liable for cessation of Kalvion's mining activities on Mars.

c. THE DAMAGE TO KALVION'S MINING ACTIVITIES WAS CAUSED DUE TO NEAPILIA'S FAULT

According to Art. III of the LIAB the fault of the launching state is the vital criterion for the determination of the liability. Nevertheless, the term "fault" is not defined by the LIAB. No cases appeared before judicial bodies where the fault of the launching state was established. Even the case of Iridium 33 and Cosmos 2251 collision[202] was not resolved under the LIAB due to conflicting information and difficulty as a matter of actual practice to prove the origin of damage.[203] Thus Kalvion resorts to the definition given in doctrine that "fault" for the purposes of Art. III as "intent or negligence to cause damage in respect of someone else active in space".[204] "Negligence" in the terms of fault means "full knowledge that the damage will probably result".[205] The standard to determine the damages being covered by liability under the LIAB is the test for the foreseeability of damages.[206]
Even though Neapilia proclaimed the intent to solve overpopulation crisis,[207] it acted negligently. Even if Neapilia could not itself foresee the damage

196 Facts, para 18
197 Facts, para 24
198 Facts, para 21
199 Facts, para 24
200 "Continuation", Oxford Dictionary
201 Facts, para 28
202 Iridium 33 and Cosmos 2251 Collision
203 Fasan, p.51
204 Dunk Liability, p.366
205 Mazaroff, p.94
206 Carpanelli, p.6-7; Christol, p.358-359
207 Facts, paras 4, 19, 28

arising from "50 Rays" programme to Kalvion's space objects, Kalvion, firstly, drew Neapilia's attention to possible negative consequences namely impossibility for the UMVs-2 to perform their primary function due to the "50 Rays" programme and, secondly, formally requested the cessation of the programme.[208] However, Neapilia refused[209] and only proposed Kalvion to enter into HAMs' purchase agreement,[210] which did not resolve the problem of the loss of the UMVs-2' functionality.

The criterion of "fault" in terms of Art. III of the LIAB is met since Neapilia acted negligently and, therefore, is liable for the cessation of Kalvion's mining activities on Mars.

3. Kalvion complied with the requirements of filing the claim

Under the LIAB a claim for damage shall be presented through diplomatic channels (a) and within one year following the date of the occurrence of the damage or of the identification of the liable launching State (b).

a. KALVION FULFILLED THE REQUIREMENT TO PRESENT A CLAIM THROUGH DIPLOMATIC CHANNELS

Diplomatic channels are the means to present the claim for compensation for damage to a liable launching state.[211] While Art.X(1) LIAB does not specify what exact diplomatic channels should be invoked, Kalvion's formal contact to Neapilia, the launching state, with the request of the cessation of the "50 Rays" programme,[212] shall be considered as appropriate channel. Thus, the requirement to present the claim via diplomatic channels is met.

b. KALVION COMPLIED WITH THE TERM OF FILING A CLAIM

A claim for compensation for damage may be presented to a launching state within the term of one year of occurrence of damage (i) or following the identification of the respective liable launching state (ii).[213]

i. Kalvion filed the claim within one-year after occurrence of the damage

The damage to Kalvion mining activities was continuous and began in November 2052, when the Technology Trial began altering natural Mars environment and thus unfitting UMVs-2 to perform their functions. [214] Kalvion contacted Neaplia in March 2053 requesting the cessation of "50 Rays" programme in order to cease the damage to mining activities.[215]

208 Facts, paras 23; Memorial III.A.4.a
209 Facts, paras 23, 28
210 Facts, para 23
211 Art. IX LIAB
212 Facts, para 23
213 Art. X(1) LIAB
214 Facts, paras 19, 21
215 Facts, para 23

Therefore Neapilia was aware of the damage inflicted to Kalvion. Thus, having duly contacted Neapilia soon after occurrence of the damage, Kalvion complied with the requirement to present the claim within one-year term after occurrence of the damage.

ii. Alternatively, Kalvion complied with one-year term following the identification of the respective liable launching state

The final identification of Neapilia as the liable launching state took place in August 2055 when Neapilian Prime Minister responding to United Nations Security Council Resolution on urging to comply with international space law[216] declared the continuation of operations on Mars "environmental intervention".[217] Kalvion's claim on Neapilian liability for the cessation of Kalvion mining activities on Mars took place immediately after January 2056,[218] thus fulfilling the provision of the term "within one year following the date of the identification of the launching State" which would elapse only on August 2056.

C. IN ANY EVENT, NEAPILIA IS LIABLE UNDER GENERAL INTERNATIONAL LAW

Kalvion has already stated that liability as duty to compensate damage may arise not only as liability under the LIAB, but also as a consequence of committing an internationally wrongful act under ARS.[219]
With this Kalvion submits, that the ground for claim for compensation — international wrongful act or damage — is the only difference between ARS and LIAB. Consequently, compensation under ARS and LIAB may be paid in a parallel with each other, if both grounds are met. Otherwise, discharge of compensation under LIAB does not preclude compensation under ARS if the international wrongful act is committed. LIAB and ARS have identical rules on determination of damage and compensation for it,[220] therefore Kalvion's damage is recoverable in a form of compensation. Neapilia committed an international wrongful act,[221] thus owes to Kalvion an obligation to compensate for the cessation of Kalvion's mining activities on Mars.

216 Facts, para 27
217 Facts, para 28
218 Facts, paras 34, 36
219 Memorial II.C
220 Memorial II.A.3,III.A.3
221 Memorial I.D.1