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The Grey Side of the Moon: A Lunar Security and Governance Tabletop Simulation

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The Grey Side of the Moon: A lunar security and governance tabletop simulation

An overview by Samuel Jardine and Simon Cleobury



Two competing state lunar programmes, one military-based, one civilian, and a commercial entity all operating in one fictional lunar south pole region. What could go wrong?

1. Executive summary

- Ambassadors and Diplomats from **both Artemis Accords and International Lunar Research Station states** took part, alongside officials from United Nations agencies and a collection of space, security, cyber and legal experts.
- **Northstar deployed most of its starting infrastructure in the first few minutes of play and took the Argent Massif at G7**, the only square south of the crater chain that combines near-continuous sunlight, a direct link to Earth and line of sight across 39 of the 96 squares. It announced the deployment publicly. Keystone and Vesper then had to plan around infrastructure that was already in place. This set the pace and focus of the exercise.
- **Northstar later deployed a nuclear reactor to H6 without declaring it**, into a square where a Keystone rover was already operating. The damage roll hit nothing. Keystone declared its own presence after the event, asked for consultation and warned about interference. Northstar did not respond. The deployment was never detected, because Keystone bought no surveillance capability until the fourth Resupply Call.

- **No team declared a safety zone or an operational area during the three hours of play.** Teams coordinated using public declarations, written bilateral agreements and a voluntary information exchange proposed by Vesper.
- **Vesper sold power, survey information and access to both state programmes** and ended with assets or agreements in 11 squares, against 10 for Northstar and 6 for Keystone. Neither state challenged it publicly. Participants said in the debrief that this was because Vesper had avoided interfering with either of them.
- **Keystone agreed communications access with Northstar**, accepting that a station operated by military personnel was consistent with peaceful use in that instance. Keystone stated that the agreement applied only to that case and did not change its general legal position.
- **Keystone finished on 20.5 points, Northstar and Vesper on 20 each, out of a maximum of 22.** All three finished in the Cooperative reputation band, which is the highest of the three. Reputation moves only on conduct that other teams have established, and Northstar's concealed actions were never established or discovered by the other teams.



Opening brief at the Geneva Centre for Security Policy

2. Introduction

The Grey Side of the Moon is a tabletop exercise on lunar security and governance. It was held at the Geneva Centre for Security Policy on Monday 7 September 2026, alongside the UNIDIR Outer Space Security Conference. The exercise was delivered in partnership by the **Open Lunar Foundation** and the **Geneva Centre for Security Policy**. Samuel Jardine of the Open Lunar Foundation designed and facilitated the exercise, with Simon Cleobury of the Geneva Centre for Security Policy as co-facilitator.

Around 27 participants took part. **They included ambassadors and diplomats working on disarmament, security and space from states associated with both the Artemis Accords and the International Lunar Research Station, officials from United Nations agencies, and specialists in space, security, cyber policy and law.** Each team was supported by Expert Guides who had

studied the rules and team materials in advance. They explained the mechanics, managed token budgets, prepared action slips and helped teams track their objectives.

Participants were divided into three teams representing two competing state lunar programmes and a commercial operator. All three were attempting to establish a presence in the same fictional region of the lunar south pole. The exercise combined physically modelled terrain and realistic, operational constraints and challenges, with role-play, hidden objectives and competing political interpretations of the Outer Space Treaty and other policy positions between the teams.

The scenario was triple-blind. Each team's map showed only the information it possessed at the outset, had obtained through surveillance or had received from another actor. Shared information could be incomplete, misleading or simply mistrusted. Within this environment, routine activities such as deploying infrastructure, extracting resources, operating surveillance systems and establishing communications could acquire political or security significance.

Four questions framed the exercise:

1. **What does “peaceful purposes” permit?** One state programme is operated entirely by its armed forces and interprets Article IV as permitting military personnel and equipment used for peaceful ends. The other takes a more restrictive view of military installations on the Moon. A communications array or monitoring station may therefore be regarded as ordinary infrastructure by one actor and a prohibited military installation by another.
2. **When does activity become harmful?** Lunar operations produce effects regardless of intent. Dust, surface traffic, radio transmissions and the proximity of infrastructure can all disrupt another actor's activities, yet there is no agreed operational definition of harmful interference.
3. **Can actors coordinate without trust?** Each team holds different information about the terrain and the activities taking place across it. Claims made by other actors cannot be assumed to be accurate, while existing registration information is neither standardised nor detailed enough to support operational coordination.
4. **How can genuine security risks be distinguished from ambiguous activity?** The same equipment may support science, safety or surveillance. A rover operating beside another team's site may be mapping terrain, collecting samples, monitoring activity or preparing to interfere. Its purpose cannot be established from proximity or capability alone.

2.1. Exercise Logic

The exercise combines a **sandbox tabletop** with a **role-playing serious game**. The sandbox is grounded in physical data: the terrain, resources and operating conditions are modelled, but events are unscripted, and teams may attempt any action they have the resources to undertake. The role-playing layer gives each team a public posture, four hidden objectives and a legal interpretation of the Outer Space Treaty that it must defend before the other teams.

This combination reflects the nature of the problem. Positions on harmful interference, peaceful purposes or operational areas can coexist in the abstract because nothing forces their practical consequences into view. Tensions emerge when actors need the same ground, infrastructure or services at the same time.

The sandbox gives the exercise a tangible operational core. Its terrain, assets and costs place every team on the same physical landscape, with firm limits on what it can reach, build and afford. Participants must manage the practical pressures of planning missions and establishing a lunar presence while working to a shared operational tempo. Within those constraints, teams remain free

to negotiate, trade, declare areas, share or withhold information, and devise their own coordination mechanisms. Every proposal is tested against the same physical conditions.

The role-playing element adds political and human pressure. Hidden objectives pull teams in directions they cannot fully explain to others, creating uncertainty about the motives behind apparently reasonable decisions. Briefing materials, public statements and private instructions can deepen this atmosphere, reflecting the low levels of trust between competing states. Participants are also placed in positions different from their own: a diplomat may have to argue a commercial case, while a lawyer may find themselves running a military programme. This allows them to test unfamiliar arguments against their own assumptions and professional experience.

The design therefore applies pressure from outside and inside each team. Externally, participants face competing actors, scarce sites, incomplete information and treaty provisions with no agreed operational meaning. Internally, they face budgets that cannot meet every requirement, hidden objectives that may pull against their public posture, and disagreements over which priorities should come first.

Together, these elements give legal and political positions an operational price. A team must fund its preferred approach, defend it before its rivals and decide what it is willing to trade to preserve it. This creates the conditions for deeper exploration, stronger analytical insight and practical learning for everyone involved.

3. Tabletop Overview

3.1 The Teams

Three asymmetrical teams arrive in the same region at the same time.

Team	Actor type and legal position	Public posture
Northstar Programme Caldon Union, blue	The lunar programme of one of the two leading space powers. It is run by the armed forces, funded from the defence budget and crewed entirely by commissioned officers. Caldon's position is that peaceful purposes means non-aggressive rather than non-military, and that military personnel operating surveillance and nuclear power are therefore permitted under Article IV.	Establish a permanent presence, lead how the region is governed, and hold an independent picture of what the other teams are doing.
Keystone Programme Serrin Republic, red	The Serrin Republic's mainly civilian programme. Its position is that Article IV prohibits military installations outright, that Article II prohibits appropriation by any means, and that Article IX requires consultation.	Establish a permanent presence, defend the strict reading of the treaty, and prevent Caldon leading in terms of presence and governance.
Vesper Lunar Registered in Devonian, green	A mining and logistics company that has been prospecting the region for two years and holds the only rover on the surface at the start. Devonian is responsible for it under Article VI. Its space agency has four staff, Vesper's lawyers draft its licence applications, and every application has been approved unchanged.	Mine on its own terms, sell to both state programmes, and be treated as an equal actor rather than as a company for states to regulate.

Starting resources differ between the teams.

Team	Start	Resupply	Starting position
Northstar	12 tokens	+4 per Resupply Call	Nothing on the surface.
Keystone	12 tokens	+4 per Resupply Call	Nothing on the surface.
Vesper	14 tokens	+1 per Resupply Call, and +3 more for each working production zone	One rover at D10, and confirmed survey data that neither state holds

Vesper's advantage is information. It holds confirmed survey data on helium-3 signatures in the northern plains, on the ice deposit at Styx in H6, which it knows to be workable and on the route onto the Styx basin floor.

3.2 Team Objectives

Each team held four hidden objectives worth two points each, and no team saw another team's objectives. The fourth objective is the same for all three teams, which makes the end of the game a contest for footprint.

Team	Hidden objectives, two points each
Northstar	Hold the high ground. Control G7, or set the terms on which other teams use it. Settle Article IV in practice. Get both rivals to accept a working definition that permits a military-led programme. Keep Keystone in view. Independently verify a material fact about a Keystone site. Keystone's own declarations do not count. Do not be carved up. Hold the largest uncontested footprint, or obtain shared access to the other teams' areas. Prevent yourself from being restricted.
Keystone	Reach the ice that matters. Hold an operational position at one of the three major ice deposits. Test the claim. Operate through a declared area and cause it to be narrowed, conditioned or withdrawn. Full credit also applies if no such declarations exist at the close. Leave something to study. Locate and protect two grade-3 scientific sites, uncontaminated by mining, infrastructure, dust or nearby interference. Do not be carved up. As above.
Vesper	Become indispensable. End with continuing arrangements with both state programmes for something they cannot readily replace. Keep your hands free. Avoid any framework that materially restricts Vesper's operations. A seat at the table. Be treated as an equal by both states rather than as a company to be regulated. Do not be carved up. As above.

Keystone's second objective awarded full credit either for causing a declared area to be narrowed, conditioned or withdrawn, or for there being no declared areas at all at the close. No team declared one, so Keystone scored two points on it.

3.3 How the Game Works

Play was continuous. All three teams operated simultaneously and could take as many actions as their resources allowed, in any order. Negotiation and conversation carried no cost. Every operational action had to be submitted on a written **action slip** identifying the proposed action, the asset involved, its location and who could receive the result. The team's Expert Guide prepared the slip and delivered it to a facilitator, who resolved the action and reported the outcome.

At roughly fifteen-minute intervals, play paused for a **Resupply Call**. Teams received additional tokens, and the facilitators announced a brief public update on events that had become

Mission Tokens represented the combined limits of political authorisation, launch capacity, equipment, engineering effort and funding. A rover or solar array cost two tokens; a habitat, ISRU plant or landing pad cost three; and a nuclear reactor cost six. Teams therefore had to decide which capabilities to prioritise, which to postpone and which they might obtain through cooperation with another actor.

Each team could score 22 points. Six came from the public objective, which for the two-state programmes meant six working elements of a permanent presence at the close: power, communications, habitat, ISRU plant, landing pad and access to water ice. Eight came from the four hidden objectives. Three came from **norm influence**, scored on whether other teams had to respond to a team's position, changed their conduct because of it, or worked to terms that team had set. Five came from **reputation**, banded Cooperative, Competitive or Aggressive, with all three teams starting Competitive. The band moves only on evidence the room has established. This scoring encouraged and provided multiple routes and playstyles- teams could focus on particular objectives and could adjust their playstyle as they needed- ranging from competitive to cooperative, with no particular stance being penalised.

Most of the exercise rules are grounded in published scientific and engineering analysis. That evidence has been simplified where necessary to produce clear, playable consequences while preserving the underlying physical constraints.

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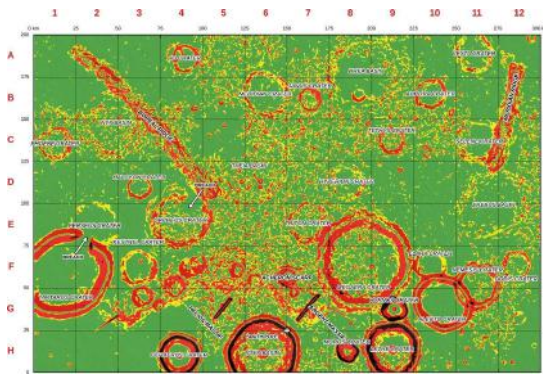
and ILRS south-polar operating areas. Open Lunar Foundation, Mehak Sarang (2026), using JPL MoonTrek and Hu et al. (2023).

- **Light and visibility.** At the lunar south pole, the Sun moves around the horizon and rises no more than approximately seven degrees above it at the candidate landing sites. This creates intense glare when facing the Sun and deep shadow in the opposite direction. [NASA's Engineering and Safety Center describes conditions unlike those encountered during Apollo and identifies human vision as a limiting factor](#). The exercise represents this constraint by giving assets no automatic observation capability. A team must purchase a surveillance package for two tokens and fit it to a building before that asset can observe activity around it.
- **Cold and volatile deposits.** [Temperatures in permanently shadowed areas near the lunar south pole have been measured as low as 29 kelvin](#). At these temperatures, cold traps can retain carbon dioxide as well as water, with their composition determined partly by temperature. Other resources are distributed differently: [solar-wind volatiles such as helium-3 are implanted at low concentrations across much larger areas](#). The exercise reflects this difference by allowing water extraction from one workable square, while helium-3 production requires access to four connected squares.
- **Power.** The exercise treats nuclear power as the only source capable of continuously operating a habitat or ISRU plant, while every major ice deposit in the region lies in permanent shadow. This reflects the scale and continuity of the power required. NASA reference studies estimate approximately [68 kilowatts for a water-mining plant](#) and [20 kilowatts for a habitat](#), compared with a [40-kilowatt fission surface power baseline](#). The effective specific power of [photovoltaics can fall from roughly 130 watts per kilogram to around 1 watt per kilogram](#) once sufficient storage is included to maintain power through darkness.

Power is transmitted by cable in the exercise. This keeps the rule manageable and reflects the considerable mass difference between transmission options: one study estimated that [moving 40 kilowatts over one to three kilometres would add approximately 3,200 kilograms using cable, compared with around 30,000 kilograms using microwave transmission](#). Cable costs one token per square and must be drawn on the working map. Every square it crosses therefore becomes a potential point of disruption.
- **Radio communications.** [The Moon has no significant ionosphere](#), making direct surface communications dependent on line of sight, while [lunar terrain can block or degrade links](#). In the exercise, two communications towers within line of sight interfere with one another, disrupting both links. Neither receives automatic priority. This reflects the absence of a [dedicated lunar frequency-allocation and coordination regime](#).

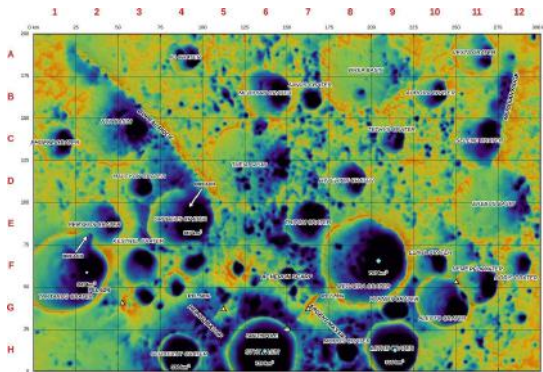
4. The Maps

All three teams used the same four A3 map sheets. Each was generated from a single terrain model, ensuring that the slope, illumination, Earth visibility and line-of-sight layers remained consistent across the exercise. Every grid square represented an area 25 kilometres across. This scale reflected published operational precedents: scientific analysis has proposed an [exclusion radius of approximately 20 kilometres around a protected lunar surface site](#), while the [closest comparable published tabletop used a 25-kilometre safety zone](#).



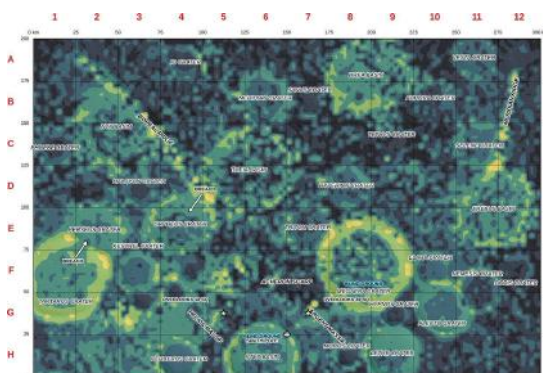
Sheet 1, Traverse Feasibility

Grades every square as safe, moderate, hazardous or impossible on slope measured over a 500 metre baseline. **Sixty-seven per cent of the region is safe going, 17 per cent moderate, 15 per cent hazardous and 1 per cent impossible.** The crater chain across rows F and G is the main barrier between north and south.



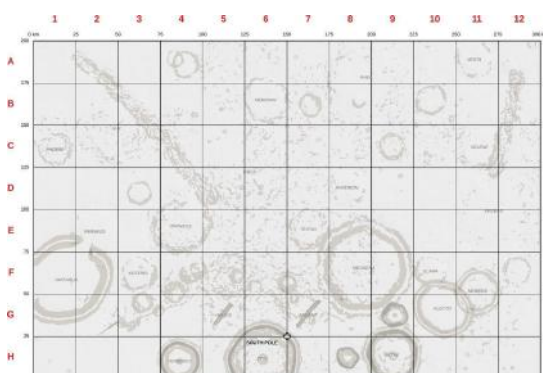
Sheet 2, Average illumination

Shows the fraction of a lunar year each square spends in sunlight, ray-traced across a full year of solar motion. Solar arrays work only on the marked peaks of eternal light. Six shadowed deposits are marked with their area and temperature, of which **three exceed 500 square kilometres and count as major deposits. All three are in the south.**



Sheet 3, Observation and Exposure

Shows what each square can see and what can see it, computed with a ten metre mast at each end. Line of sight is symmetric.



Sheet 4, Working Map

Blank apart from grey shading on hazardous and impossible ground. Teams put their models on here and can draw cables, areas, and zones on it and add sticky notes for other teams' assets as they learned of them.

5. What Happened

5.1 The Opening Deployments

Northstar seized the initiative in the opening minutes. It committed most of its starting resources to infrastructure on and around the Argent Massif at G7, then announced the deployment publicly. By the time its rivals began committing significant resources, Northstar's assets were already operating and shaping the choices available to them.

Keystone subsequently concentrated its activity on **G7 and the surrounding squares**. Vesper entered the same area to sell power and access to water to the two state programmes. Activity therefore converged rapidly: despite the region containing 96 squares, all three teams established operations within the same small cluster.

5.2 The Reactor at H6

Northstar deployed a nuclear reactor at H6 without declaring it. A Keystone rover also entered the square, although the interference roll produced no damage or operational effect. Keystone publicly claimed that it had been present first, requested consultation and warned that others' activity (aimed at Northstar) could cause interference. Northstar did not respond.

Keystone suspected that Northstar was responsible for the near-accident but had no means of confirming what had been deployed or what its purpose was. It chose not to escalate. The incident therefore remained an unanswered request for consultation rather than developing into a wider dispute. Northstar suffered no reputational penalty because the secretive way it had gone about deploying its reactors was never specifically uncovered; instead, it got tallied up as a miscommunication- something all stakeholders early on were doing. The participants could establish only that assets belonging to both programmes were operating in the same square. Vesper later said that the incident had led it to question Northstar's earlier public announcements.

By the end of the exercise, nuclear reactors belonging to different programmes occupied the same 25-kilometre square. Their co-location around vital locations highlighted the safety and security sensitivities that could surround independently operated nuclear power sources in the same area.

5.3 Landing Pads and interference

The teams reduced the main sources of interference within the first hour of play. Landing pads were purchased early, removing both the terrain risk check and the dust effects from the pad's square and all eight adjacent squares. Subsequent deliveries into those areas could therefore take place without exposing nearby assets to landing damage. Teams also coordinated the placement of communications towers to keep them outside one another's line of sight, avoiding radio interference.

These risks were managed through unilateral planning and bilateral coordination, without a multilateral agreement. The incentive was primarily operational- teams built landing pads to make their own deliveries safer and more reliable. The wider reduction in interference followed from that decision.

5.4 Declaration and Concealment

Keystone declared its deployments from the outset, telling the other teams what it was placing and where. Its final footprint covered six squares, compared with Northstar's ten, reflecting a more concentrated pattern of investment across fewer sites.

Northstar announced some deployments while concealing others, including its reactor. None of its undeclared assets was independently detected. Keystone did not acquire surveillance capability

until around the fourth Resupply Call, leaving it unable to verify Northstar's activity during much of the exercise.

Concealment became more difficult as activity concentrated around G7. With all three teams operating within the same small cluster of squares, much of the visible infrastructure could be observed directly whether or not it had been formally declared. Declarations improved coordination, but they still provided only a partial account of what was present.

5.5 Vesper and the Commercial Position

Vesper committed resources more slowly than either state programme. Its players initially debated whether to invest in a landing pad or concentrate on generating revenue, ultimately deciding that the company needed income first. In the debrief, they described finding it difficult to choose a direction while Northstar deployed rapidly and Keystone responded.

Vesper eventually pursued a strategy based on making itself useful to both states. It agreed to reciprocal landing-pad access with Northstar, sold nuclear power to Keystone and offered surveillance to Northstar as a service. The surveillance agreement did not become operational because Vesper took too long to deploy the necessary capability. It also proposed an information exchange and introduced a **Lunar Ledger** arrangement to formalise voluntary information-sharing. This helped Vesper coordinate communications with both state programmes and avoid interference. As Northstar and Keystone became increasingly concentrated in the south, Vesper moved its exploration north into unoccupied ground and discovered helium-3.

By the close, Vesper had assets or agreements covering **11 squares**, giving it a wider footprint than either state programme. Much of that presence supported another team's operations, and neither state challenged it publicly. Participants attributed this acceptance to Vesper's conduct: it supplied capabilities that both sides valued while avoiding interference with either programme.

Its position remained conditional. Participants expected Vesper's standing to weaken quickly if it began obstructing state activity. Such conduct would also have raised questions about how Devonian was authorising and supervising the company under Article VI of the Outer Space Treaty. A longer exercise would probably have tested these limits as Vesper's footprint and influence continued to grow.

The role also exposed two weaknesses in its commercial model. States repeatedly requested services without offering payment. Survey information could be sold once, after which its exclusivity, and much of its market value, disappeared. Vesper's players considered this an unsustainable basis for a business.

Some of Vesper's participants noted that competing states were likely to avoid independent commercial suppliers when they could provide the same infrastructure themselves. A company could sustain Vesper's position only while filling a capability gap that states could not immediately address. While that gap remained, however, a commercial operator could gain considerable influence over emerging technical and operational standards within a polycentric system of lunar governance.

5.6 Bilateral Agreements As "Go-To"

Several bilateral agreements were concluded during play, including:

1. **Northstar and Vesper** agreed to reciprocal access to one another's landing pads.
2. **Keystone and Vesper** agreed that Vesper would supply nuclear power to Keystone.
3. **Northstar and Keystone** agreed to communications access. Keystone accepted that the station would be operated by military personnel and that, in this specific instance, such

operation was consistent with peaceful use. It maintained that its wider interpretation of Article IV had not changed.

Vesper also told Northstar privately that it accepted Northstar's broader governance position, although it made no equivalent public statement. Following the communications agreement with Keystone, Northstar presented its personnel in full military uniform for the remainder of the exercise. The gesture appeared to assert Northstar's military status openly while increasing the political cost to Keystone of its case-specific compromise.

5.7 Surveillance and the Absence of Declared Zones

Most surveillance capability appeared during the second half of the exercise. This may partly reflect participants learning an unfamiliar ruleset. It may also indicate a natural sequence of priorities: teams first established their own presence, then invested in monitoring once uncertainty or interference gave them a reason to investigate others. A Keystone rover moved among sites operated by both rival programmes for much of the exercise without being challenged.

No team declared a formal safety zone or operational area. One participant observed that practical coordination mattered more during this exercise than exclusive access or a requirement to keep others out. Three features of the run help explain the absence of declared zones:

1. **Other mechanisms met the immediate need.** Public declarations, bilateral agreements and voluntary information-sharing enabled teams to coordinate at a lower political cost.
2. **Infrastructure reduced the physical risk.** Landing pads removed the principal hazard that might otherwise have justified a protected area.
3. **Rover proximity caused disruption without damage.** Under the rules, an uncoordinated rover temporarily stopped infrastructure in the same square but did not damage it. One participant argued that this reduced the pressure to establish safety zones or similar operational areas.

6. Final Scores

The three teams finished within half a point of each other. Operational footprint at the close was Vesper 11 squares, Northstar 10 and Keystone 6.

Component	Northstar	Keystone	Vesper
Public objective out of 6	6	6	5
Hidden objective 1	2	2	2
Hidden objective 2	1.5	2	2
Hidden objective 3	2	2	2
Hidden objective 4	1	1	2
Norm influence, of 3	2.5	2.5	2
Reputation, of 5	5	5	5
Total, of 22	20	20.5	20

Keystone's additional half point came from its argument that its influence over norms was strengthened by the absence of any challenge to its conduct, and that this should be read as tacit acceptance of its approach.

All three teams finished in the Cooperative band, which is the highest of the three. Reputation moves only on conduct that has been established publicly, so Northstar's concealed actions had no effect on its score.

7. Overall Dynamics and Findings

- **Operational need changed how the Article IV disagreement was applied, without resolving it.** Keystone accepted a military-operated communications station because it needed access to the link. It presented this as a case-specific exception and maintained its broader legal position.
- **Engineering contained interference before it became a significant political problem.** Landing pads, careful tower placement and voluntary information-sharing addressed most immediate risks. The exercise ran for only six Resupply Calls, limiting the time available for infrastructure to accumulate and crowding to produce more serious consequences. Facilitators and participants expected interference complaints to increase during a longer game.
- **Verification constrained coordination more than willingness to cooperate.** The teams coordinated more often than they competed, despite establishing no formal zones, common consultation mechanism or joint body. Their arrangements remained fragile: every team was concerned that access or services might be withdrawn, and none could independently confirm everything the others claimed.
- **The clearest security concern was also the only one that went undetected.** The exercise featured a concealed nuclear reactor, an openly military presence, a rover operating unchallenged around rival sites and a surveillance contract that was never delivered. Of these, the undeclared reactor created the clearest security concern, yet no other team verified its existence.
- **Vesper's standing depended on its conduct.** Its commercial status did not provide automatic acceptance. Participants said that its position would have been challenged if it had interfered with either state programme.
- **The format connected strategic competition to the practical difficulty of lunar operations.** Participants found that the exercise helped them understand both the physical operating environment and the political pressures created when competing actors share it. The conclusion repeated most often during the debrief was simple: **the Moon is hard.**

8. Future Development and Feedback

This was the first run of a new exercise and ruleset. Feedback on its substance was positive, while the session identified three broader areas for development.

1. **The line-of-sight mechanic created a facilitation bottleneck.** Observation was calculated from terrain elevation, with all sightlines computed before the exercise. The difficulty therefore lay in processing requests. With three teams acting continuously, facilitators had to check every observation claim against the relevant sheet and return the result to the correct team. Requests accumulated during busy periods and slowed the flow of information. Additional facilitator capacity and a faster table-based lookup system would reduce this delay.
2. **The rules placed a high initial demand on participants.** The physical and security mechanics made this ruleset heavier than those used in earlier exercises in the series, particularly for participants committing three hours during a conference week. Players needed more preparation and guidance before they could act confidently. Several participants also regarded the complexity as a strength because it reproduced the difficulty of operating on the Moon and made that difficulty part of the political problem. The working

conclusion is therefore to preserve the operational depth while transferring more of the administrative and cognitive burden to the facilitation team.

3. **The boundaries of the security scenario require further consideration.** The exercise deliberately excluded lunar-based weapons. In a public tabletop held in a disarmament setting, making weaponisation available as a strategy could send an unhelpful message and draw attention away from the intended focus: the grey area between accidental and deliberate interference, and the capacity of routine lunar operations to become political flashpoints in a crowded, low-trust environment. Some participants nevertheless argued that future versions should consider cyberattacks and kinetic threats, particularly as these capabilities are now being [discussed in relation to the future cislunar operating environment](#). These could be explored through a separate or advanced variant while preserving the focus of the core exercise.

Two immediate changes follow from the run:

1. **Reconsider the treatment of close rover operations.** Under the current rules, an uncoordinated rover temporarily halts nearby infrastructure but does not damage it. This removed a source of pressure that might otherwise have encouraged teams to establish safety zones or operational areas. One participant noted that preventing close passes near active infrastructure is likely to be an important practical reason for creating such zones.
2. **Extend play to eight Resupply Calls.** Six calls did not allow enough time for infrastructure to accumulate and the concentration around G7 to produce sustained disputes. Two additional phases would give crowding, dependence and interference more time to affect the teams' decisions.

9. Conclusion

The exercise showed how security tensions can emerge from routine lunar operations. Infrastructure placement, power supply, communications, surveillance and access to scarce sites all carried political consequences once several actors occupied the same area. Northstar's early deployment at G7 shaped the choices available to the other teams, while Keystone's need for communications led it to accept a case-specific exception to its Article IV position. Operational decisions began to influence the practical meaning of the rules before the legal disagreement itself had been resolved.

The teams proved willing to coordinate. Landing pads, careful tower placement, information-sharing and three bilateral agreements contained most immediate risks. That cooperation remained vulnerable, however. Services could be withdrawn, declarations could not always be verified, and the most sensitive deployment in the exercise remained concealed. Vesper's experience also showed that commercial influence depended on filling capability gaps and maintaining the confidence of state actors.

These findings come from a single run of a new exercise and ruleset, but they demonstrate the value of placing legal and political positions under operational pressure. The central lesson is that lunar governance will develop through decisions made on the surface as well as through agreements reached in conference rooms. Understanding those decisions requires engaging with the physical difficulty of operating on the Moon, the uncertainty surrounding other actors' intentions and the compromises that become necessary when infrastructure, resources and risk are shared.

10. Acknowledgements

Many thanks to the participants, who gave up an afternoon of a busy week to join us and get stuck in with good humour and in good faith.

A huge thank you to the Expert Guides, who read a long rule set in advance and carried the mechanics so that participants did not have to: Christopher Johnson (Leiden University), Therese Jones (European Space Policy Institute), Thomas Gonzalez Roberts (Georgia Institute of Technology), Victoria Samson (Secure World Foundation), Almudena Azcárate Ortega (Secure World Foundation and UNIDIR), Jessica West (Project Ploughshares and the Centre for International Governance Innovation) and Clémence Poirier (ETH Zurich).

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