

SPACE DEBRIS MITIGATION POLICIES FOR LARGE CONSTELLATIONS

Licensing and Continuing Supervision as Tools of Space Capacity Management

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SECOND SPACE CAPACITY ALLOCATION FOR THE SUSTAINABILITY
OF SPACE ACTIVITIES WORKSHOP - MILAN, ITALY

OVERVIEW

- Pressure on the existing framework
- Legal baseline
- Regulatory mismatch
- Policy developments in practice
- Three regulatory adjustments
- Capacity management and conclusion





PRESSURE ON THE FRAMEWORK

- Large constellations have outgrown a lower-traffic mitigation model
- Deployment, replacement, collision avoidance, and disposal now occur continuously
- Cumulative effects span operators and build over time
- The issue is no longer only end-of-mission disposal
- The issue is whether long-term orbital usability can still be preserved

LEGAL BASELINE

- OST Article VI: authorisation and continuing supervision
- OST Article IX: due regard, harmful contamination, adverse changes
- COPUOS and IADC guidelines remain the main soft-law baseline
- No dedicated treaty code for constellation-scale mitigation
- Existing law allows stricter national implementation



REGULATORY MISMATCH

- Licence unit: individual spacecraft
- Operational unit: integrated constellation
- Relevant variables: shell, density, replacement tempo, manoeuvrability
- Disposal reliability and failure effects are cumulative
- Formal compliance does not by itself control programme-scale risk



PRACTICE IS SHIFTING

- UNOOSA Compendium updated in March 2026
- IADC revisions now include large-constellation considerations
- FCC: five-year disposal rule and post-failure object-years condition
- ESA: five-year disposal, >90% successful disposal, stricter constellation requirements
- Canada: orbital-environment assessment plus five-year / 90% thresholds





CONSTELLATION-SCALED LICENSING

- The regulatory unit cannot remain only the individual spacecraft
- Applications should address shell occupancy and neighbouring systems
- Trackability, manoeuvrability, and conjunction management must be assessed at programme level
- Disposal reliability and failure response should be evaluated collectively
- Licensing has to reflect how the system actually operates

SUPERVISION & ACCOUNTABILITY

- Continuing supervision cannot end with licence issuance
- Repeated disposal failures should trigger enhanced review
- Collision-avoidance outages should trigger additional conditions
- Persistent post-failure objects should matter in deployment decisions
- Accountability should focus on environmental effect over time, not only initial promises





FROM MITIGATION TO CAPACITY MANAGEMENT

- This is not yet a complete legal regime of capacity management
- It is a move toward regulating cumulative burden in orbit
- Indicators and thresholds are becoming more operational
- Debris mitigation is becoming less episodic and more system-sensitive
- The comparative record suggests that this shift is already underway



CONCLUSIONS

- Large constellations expose the limits of mission-based mitigation
- Article VI already supports a more demanding supervisory practice
- Current policy developments point toward programme-level regulation
- The immediate task is regulatory adaptation, not treaty reinvention

THANK YOU FOR YOUR ATTENTION!

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