

VEM FÅR FLYTTA NÅGON ANNANS SATELLIT?

ILA-kommittén om de rättsliga aspekterna av rymdskrotsanering

Redogörelse till Svenska ILA efter International Law Associations 82:a internationella konferens i Wien (2026-08-17–21) för kommitténs första arbetsår

Vadstena och Lund 2026-08-23

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Kommittéledamot för Svenska ILA och samordnare för kommittéarbetsgruppen om definitioner

Att flytta ett uttjänt föremål i omloppsbana ser vid första anblicken ut som avancerad sophämtning i yttre rymden. Folkrättsligt kan samma handling vara ett ingrepp i en annan stats exklusiva jurisdiktion och kontroll, en kränkning av bestående äganderätt och ett högriskuppdrag med ansvarsföljder på jorden och i rymden. Tekniken kan alltså vara redo samtidigt som rätten ännu inte har bestämt vem som får trycka på knappen.

Vadstena; Lund: Jus Gentium, 2026

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ISBN (e-bok PDF)



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00 Sammanfattning

A Rymdskrot är inte längre en avlägsen miljöfråga. Det är en omedelbar fråga om säker tillgång till omloppsbanor, skydd av samhällsviktiga satellittjänster, ansvar för statliga och privata aktörer och, i funktionell mening, suveränitet. Yttre rymden får enligt 1967 års rymdfördrag inte bli föremål för nationellt förvärv. Samtidigt behåller registreringsstaten enligt fördragets artikel 8 domsrätt och kontroll över ett registrerat rymdföremål, och äganderätten påverkas inte av att föremålet befinner sig i rymden eller har upphört att fungera. Den som vill avlägsna någon annans uttjänta satellit möter därför ett rättsligt problem långt innan en griparm, bogseringssatellit eller kontaktlös metod närmar sig målet.

B **International Law Association**s kommitté om de rättsliga aspekterna av rymdskrotsanering inledde sin verksamhet år 2025 med ett fyraårigt mandat. Det första året har ägnats åt att kartlägga gällande rätt, icke-bindande riktlinjer, tekniska standarder, nationell lagstiftning, industriell utveckling och politiska positioner. Under våren och sommaren 2026 organiserades arbetet i fyra arbetsgrupper:

- valet av normativt instrument
- tredje mans borttagande av rymdskrot
- definitioner och terminologi samt
- ekonomiska och icke-ekonomiska incitament.

Mellanrapporterna sammanfördes inför kommitténs arbetsmöte vid ILA:s 82:a konferens i Wien den 18 augusti 2026.

C Kommitténs förstaårsarbete pekar mot en stegvis och skiktad regleringsmodell. Ett nytt globalt fördrag är knappast politiskt realistiskt på kort sikt. Däremot kan allmänna principer, genomförbara riktlinjer, nationella tillståndsregler och tekniska standarder tillsammans skapa en rättslig infrastruktur för säkra och legitima saneringsuppdrag. Den gemensamma nämnaren är samtycke: vem kan ge det, hur kan det lämnas i förväg, vilka uppgifter krävs för att identifiera objektet, och finns det yttersta undantag vid fara för liv eller andra väsentliga intressen?

D **Svenska ILA** har genom sitt deltagande fått en särskilt synlig roll i denna process. Jag utsågs till samordnare för arbetsgruppen om definitioner och terminologi. Det är inte en redaktionell biuppgift. De fem FN-fördragen om yttre rymden använder centrala uttryck utan att definiera dem uttömmande, och något internationellt accepterat juridiskt begrepp för rymdskrot finns ännu inte. Definitionerna avgör vilka föremål och handlingar som omfattas, vilken stat som skall kontaktas, om en operation kräver tillstånd eller samtycke, vad som måste bevisas och hur en framtida marknad kan licensieras, försäkras och kontrolleras. Svenska ILA befinner sig därmed vid ett av kommittéarbetets viktigaste gränssnitt: mellan fördragsrätt, teknisk verklighet och genomförbar reglering.

01 Varför rymdskrotsanering inte kan vänta

1 Satelliter är numera en del av samhällets grundläggande infrastruktur. Navigering, väderprognoser, telekommunikation, bank- och betalsystem, jordobservation, katastrofhantering, militär lägesbild och drift av kritisk infrastruktur är beroende av fungerande rymdsystem. Därför är risken från rymdskrot inte proportionell mot föremålets ekonomiska värde. En liten metallbit i omloppsbana kan med flera kilometers hastighet per sekund skada ett aktivt system som kostat hundratals miljoner euro och som samtidigt bär samhällsviktiga funktioner.

2 Europeiska rymdorganisationens löpande statistik visar problemets skala. Vid tidpunkten för denna redogörelses slutredigering sommaren 2026 följdes mer än 46 000 objekt, medan modellerna uppskattade omkring 54 000 objekt större än tio centimeter, cirka 1,2 miljoner objekt mellan en och tio centimeter och ungefär 140 miljoner objekt mellan en millimeter och en centimeter. Den sammanlagda massan i omloppsbana översteg 17 000 ton. Siffrorna är osäkra, men deras budskap är klart: de flesta riskobjekt kan inte ens spåras kontinuerligt, och varje kollision kan skapa tusentals nya fragment.

3 Rymdskrotsminskning (*space debris mitigation*) och rymdskrotsanering (*space debris remediation*) måste hållas isär. Rymdskrotsminskning innebär att förebygga nytt skrot genom bland annat passivering, kollisionsundvikande, tillförlitlig avveckling och begränsning av utsläpp under normal drift. Sådana krav återfinns bland annat i riktlinjer från Inter-Agency Space Debris Coordination Committee (IADC) och FN:s kommitté för fredlig användning av yttre rymden (COPUOS) samt i standarder antagna av Europeiska rymdorganisationen (ESA)[1] och Internationella standardiseringsorganisationen (ISO).[2] Rymdskrotsanering avser däremot aktiva åtgärder mot redan befintligt skrot: stabilisering, passivering, förflyttning, ompositionering till annan omloppsbana, nedtagning, kontrollerat återinträde eller annan verifierbar riskminskning. Även perfekt efterlevnad av framtida minskningsregler kan inte i sig undanröja den befintliga populationen av stora, kollisionsfarliga objekt.

4 Här uppstår den juridiska paradoxen. Rymdskrot är i teknisk mening något icke-funktionellt och oönskat. I rättslig mening kan det fortfarande vara ett rymdföremål med en registreringsstat, en ägare, känslig teknik och ett fortlevande ansvarssystem. Artikel 2 i 1967 års rymdfördrag

[1] Se ❶ European Space Agency, ESA Space Debris Mitigation Requirements, ESSB-ST-U-007, Issue 1 Revi-sion 1, 23 October 2025; ❷ European Space Agency, ESA's Annual Space Environment Reports (since 2017, especially the evolution of the definition of space debris in the 2017 and 2018 reports); ❸ European Space Agency, Statement for a Responsible Space Sector, 21 November 2022; ❹ European Space Agency, Zero Debris Charter: Towards a Safe and Sustainable Space Environment; ❺ European Space Agency, Zero Debris Technical Booklet.

[2] ❶ International Organization for Standardization, ISO 24113:2023, Space systems — Space debris mitigation requirements; ❷ International Organization for Standardization, ISO 24330:2022, Space systems — Rendezvous and Proximity Operations (RPO) and On-Orbit Servicing (OOS) – Programmatic principles and practices.

– d v s *fördraget om principer för staters verksamhet i utforskandet och nyttjandet av yttre rymden, inklusive månen och andra himlakroppar (SÖ 1967:7)* – förbjuder nationell tillägnelse av yttre rymden,[3] men artikel 8 knyter domsrätt och kontroll till den registerförande staten.[4] Detta är inte territoriell suveränitet över en omloppsbana. Det är däremot en suveränitetsnära, objektanknuten kompetens som andra stater måste respektera. En saneringsoperation kan därför inte jämställas med att plocka upp herrelöst avfall på allmän plats.

5 Teknisk förmåga ger inte rättslig behörighet. Ett servicerobotfordon som kan gripa, stabilisera eller flytta en satellit kan också inspektera eller påverka ett militärt eller kommersiellt känsligt system. Samma teknik är ofta dubbelanvändbar. Tillstånd, exportkontroll, cybersäkerhet, skydd av tekniska data och bevisning om vad operationen faktiskt gjorde blir därför lika viktiga som fångstmekanismen. Rymdskrotsanering är samtidigt miljörätt, säkerhetsrätt, ansvarsrätt, egendomsrätt och marknadsregleringsrätt.

02 Kommitténs tillkomst och fyraåriga mandat

6 Kommittén inrättades efter ett förslag av professor **Stephan Hobe** från ILA:s tyska avdelning och började formellt sitt arbete den 21 maj 2025. **Mandatet** återges i **bilaga 1** på engelska med en privat översättning till svenska som saknar officiell status. Det byggde vidare på ILA:s långvariga rymdrättsliga tradition. Den tidigare rymdrättskommittén hade bland annat tagit fram Sofiariktlinjerna för nationell rymdlagstiftning 2012 och reglerna om kastbanefärd (icke-orbital rymdfärd) 2024. Den hade också behandlat rymdskrot inom bredare teman, men inte utarbetat en sammanhållen rättslig ordning för aktiv sanering av befintligt rymdskrot.

7 Mandatet är tydligt resultatinriktat. Under det första året skall kommittén samla in och bedöma internationella och nationella rättskällor, icke-bindande instrument, tekniska material, myndighetspraxis, industrins utveckling och politiska positioner. Det andra året skall leda till en rapport om de första slutsatserna. Det tredje året skall ägnas åt möjliga lösningar. Under det fjärde året skall arbetet samlas i en ILA-resolution och en genomförandeinriktad handbok för internationella och nationella lagstiftare. Ambitionen är alltså varken en rent akademisk monografi

[3] Artikel 2 har följande ordalydelse i den svenska översättningen av 1967 års rymdfördrag:

Yttre rymden, däri inbegripet månen och övriga himlakroppar, kan ej förvärvas av någon stat genom hävdande av suveränitet, genom nyttjande eller besittningstagande eller på annat sätt.

[4] Artikel 8 har följande ordalydelse i den svenska översättningen av 1967 års rymdfördrag:

Fördragsslutande stat i vars register ett rymdföremål förs skall behålla domsrätt och kontroll över sådant föremål jämte personal på detsamma, då det befinner sig i yttre rymden eller på en himlakropp. Äganderätten till föremål eller del därav som sänts ut i yttre rymden, däri inbegripet föremål som landat eller byggts på en himlakropp, påverkas ej av dess närvaro i yttre rymden eller på en himlakropp eller av dess återvändande till jorden. Sådana föremål eller delar därav, som påträffas utanför den registerförande statens gränser, skall återlämnas till denna stat, som på begäran skall lämna uppgifter för identifiering av föremålet innan det återlämnas.

eller ett tekniskt standardverk, utan rättsliga förslag som kan användas utan att lägga onödiga hinder i vägen för en framväxande privat sektor.

8 Det fyraåriga upplägget är viktigt. Förstaårsunderlagen är inte färdiga ståndpunkter. De är kartor över rättsliga problem, preliminära analyser och förslag till arbetsmetoder. Wienmötet den 18 augusti 2026 var därför ett arbetsmöte och ett vägval, ingalunda någon slutpunkt. ILA:s fullständiga konferensrapport publiceras först 2027. Denna svenska redogörelse bygger på kommitténs cirkulerade dokument, de fyra arbetsgruppernas mellanrapporter, den konsoliderade rapporten och min egen medverkan inför och vid mötet.

03 Från enkät till fyra arbetsgrupper

9 Efter kommitténs första möte den 29 november 2025 cirkulerade ordföranden en **enkät** som samlade arbetet kring **sex frågor**:

- Vilken sorts instrument borde ILA föreslå?
- Är rymdskrot fortfarande ett rymdföremål enligt gällande rymdrätt?
- Får en tredje part avlägsna någon annans rymdskrot?
- Vilka incitament kan göra sanering möjlig?
- Behövs en särskild definitionskatalog?
- Och hur kan kommersialisering uppmuntras utan att rättssäkerhet och säkerhet sätts åt sidan?

Enkäten återges i **bilaga 2**. Den 7 december 2025 vidarebefordrades enkäten till en bredare krets av aktörer i den svenska rymdgemenskapen. Därvid gavs uttryck för en önskan om återkoppling om de frågor och vägval som nu diskuteras i ett sedan länge etablerat och erkänt internationellt forum för rymdrättens vidareutveckling – särskilt i gränslandet mellan teknik, operativ verklighet och rättsliga ramar för rymdskrotsanering. Uttryckligen uppmuntrades adressaterna till förslag och idéer samt synpunkter, exempel och frågeställningar rörande exempelvis

- tillstånds- och ansvarskedjor vid rymdskrotsanering (inklusive försäkring och riskfördelning),
- jurisdiktion, ägande och samtyckesfrågor i förhållande till befintliga rymdfördrag,
- transparens, säkerhet och aspekter rörande dubbla användningsområden,
- behov av internationella och nationella regler, standarder eller kontraktsmodeller som stärker förutsebarheten utan att hämma innovation.

10 Vid det andra nätmötet den 27 april 2026 deltog femton ledamöter. Svaren visade både konvergens och djupa skiljelinjer. **Mitt enkätsvar** finns i **bilaga 3** till denna redogörelse. En tydlig majoritet föredrog ett icke-bindande instrument framför en ny folkrättslig traktat. En överväldigande majoritet ansåg att rymdskrot även fortsättningsvis är rymdföremål. Däremot var tredje

mans borttagande av främmande rymdskrot starkt omstritt. De flesta som var öppna för sådan verksamhet krävde tydligt formulerade villkor och samtycke, ofta i förväg. Förslagen om incitament sträckte sig från omloppsavgifter och säkerheter till tekniska standarder och marknadsmekanismer.

11 Arbetet delades därefter i fyra arbetsgrupper:

- Arbetsgrupp 1 skulle bedöma vilken normativ form slutprodukten borde få.
- Arbetsgrupp 2 skulle analysera om och på vilka villkor tredje man får avlägsna någon annans rymdskrot.
- Arbetsgrupp 3 skulle avgöra vilka begrepp som behöver definieras och hur.
- Arbetsgrupp 4 skulle undersöka ekonomiska och icke-ekonomiska incitament.

Frågorna är skilda men ömsesidigt beroende: ett samtyckessystem kan inte fungera utan begrepp för objekt, aktör, tillstånd och bevisning; incitament kan inte utbetalas utan en verifierbar prestation; och ett normativt instrument kan inte bli genomförbart om dess centrala termer är oklara.

12 Inför kommitténs sammanträde i Wien den 18 augusti 2026 skickade ordföranden och rapportörerna ut en **promemoria** med titeln *»Consolidated Findings Report: A Synthesis of the Work of Working Groups 1, 2, 3 and 4»*, **som utvärderar arbetsgruppernas synpunkter**. Dokumentet bifogas här som **bilaga 4**. Vidare gjordes en **sammanställning av arbetsgruppernas svar** tillgänglig till kommitténs ledamöter, här bifogad som **bilaga 5**.

04 Arbetsgrupp 1: en skiktad normativ väg

13 Arbetsgrupp 1 utgick från den politiska realiteten att en universell, folkrättsligt bindande traktat visserligen skulle vara den mest önskvärda lösning men knappast är genomförbar i dagens geopolitiska läge. Även en ny resolution, antagen av FN:s generalförsamling, med ett långtgående innehåll bedömdes som svår att nå. Gruppen rekommenderade därför en skiktad, i första hand icke-bindande ordning.

14 Den föreslagna ILA-resolutionen skulle innehålla tre nivåer.

- Först allmänna principer förankrade i gällande folkrätt.
- Därefter riktlinjer som kan användas i internationella överläggningar och som förebild för nationell lagstiftning om bland annat licensiering, samtycke, försäkring, finansiellt ansvar, konfidentiell information, nödbefogenheter, sanktioner och tvistlösning.
- Slutligen skulle ett utkast till principer kunna föras vidare till FN när tiden är mogen. Om arbetet får stöd kan det utvecklas till mer formella riktlinjer, läggas fram för COPUOS och presenteras vid UNISPACE IV 2027, den föreslagna fjärde FN-konferens om utforskning

och fredlig användning av yttre rymden, som planeras att hållas i Wien 12—21 juli 2027 i samband med COPUOS 70-årsjubileum.

15 Detta är pragmatiskt, samtidigt som det är folkrättsligt betydelsefullt. ILA har historiskt ofta påverkat rättsutvecklingen genom väl genomarbetade icke-bindande texter som senare tas upp av stater, internationella organisationer och nationella lagstiftare. Den skiktade modellen gör det också möjligt att skilja stabila rättsprinciper från teknikberoende detaljer. Kommittén kan formulera krav på behörighet, samtycke, ansvar och transparens, medan tekniska organisationer fortsatt utvecklar standarder för exempelvis mötesoperationer, fångst, passivering och återinträdesrisk.

16 Det diskussionsunderlag som Arbetsgrupp 1 överlämnade till kommittén för vidare beredning återges nedan på sidorna 071–072.

05 Arbetsgrupp 2: vem får röra ett främmande rymdföremål?

17 Arbetsgrupp 2 behandlar kommitténs mest omedelbara suveränitetsfråga. Utgångspunkten är artikel 8 i 1967 års rymdfördrag: registreringsstaten behåller domsrätt och kontroll över föremålet, medan äganderätten inte påverkas av dess närvaro i yttre rymden eller återkomst till jorden. Domsrätt och kontroll är inte samma sak som ägande och inte heller territoriell suveränitet. De ger dock registreringsstaten en exklusiv rättslig anknytning. Ett obehörigt ingrepp från en annan stat – eller från en privat operatör som den staten tillåter – kan därför utgöra ett folkrättsbrott.

18 Den preliminära analysen skiljer mellan registrering på nationell och internationell nivå. Artikel 8 knyter rättsverkan till den stat, i vars register föremålet förs. Underlåtenhet att anmäla objektet till FN:s register behöver därför inte i sig utsläcka domsrätt och kontroll, om nationell registrering finns. Om ingen registreringsstat kan identifieras blir situationen mer osäker. En del av arbetsgruppens utkast pekar på att borttagande då kan vara lättare att rättfärdiga. Invändningar från andra kommittéledamöter varnar samtidigt för att ett till synes »osynligt» rättssubjekt kan framträda sent och motsätta sig åtgärden. Bristande attribution får alltså inte utan vidare likställas med ägarlöshet eller rättsligt vakuum.

19 Samtycket framstår som den säkraste *de lege lata*-grunden. I **mitt svar på kommittéordförandens enkät** föreslog jag en stegvis tillståndsarkitektur.[5] En avtalsbaserad väg skulle bygga på uttryckligt, uppdragsspecifikt samtycke eller på förhand registrerat samtycke för vissa objektklasser. Avtalet skulle reglera åtkomst, ansvarsfördelning, försäkring, data- och immaterialrätt,

[5] Se **bilaga 3** §§ 11–14 på sidorna 047–048.

exportkontroll, cybersäkerhet, verifiering och tvistlösning. En administrativ väg skulle kunna användas endast när registreringsstaten i förväg har anslutit sig till ett system som medger noggrant avgränsat presumerat eller rättsligt ansett samtycke efter identifieringsförsök, formell underrättelse, väntetid och ett motiverat myndighetsbeslut. En tredje, mycket snäv väg skulle avse tillfälliga och minst ingripande stabiliseringsåtgärder vid allvarlig och överhängande fara.

20 Två spärrar är avgörande. Endast särskilt kvalificerade och säkerhetsprövade operatörer bör få genomföra uppdrag på andras objekt. Och tillstånd att sanera får inte förvandlas till en fribärgarrätt. Operatören utför en tjänst; den får inte automatiskt äganderätt, tillgång till skyddade nyttolastdata eller rätt att exploatera främmande teknik. Sjörättens bärgningsregler är därför en lockande men farlig analogi. Ett uttjänt rymdföremål blir inte herrelöst endast därför att det är icke-funktionellt.

21 Arbetsgruppen undersökte också om samtycke i undantagsfall kan ersättas av allmän folkrätt. Svårt trångmål eller olycka (*distress*) enligt artikel 24 i *FN:s folkrättskommissions utkast till artiklar om staters ansvar för folkrättsstridiga handlingar* kan möjligen åberopas när människoliv hotas och ingen rimlig alternativ handling finns.[6] Nödvändighet eller nödläge (*necessity*) enligt artikel 25 kan i extrema fall skydda ett väsentligt intresse mot allvarlig och överhängande fara.[7] Motåtgärder väcker mer komplicerade frågor om vem som är skadelidande stat, proportionalitet och möjligheten att återuppta fullgörelsen av den åsidosatta förpliktelsen. Flera ledamöter betonade att dessa redan erkända undantag är snäva och inte skapar någon allmän rätt att ensidigt avlägsna rymdskrot i miljöns namn.

22 Den viktigaste skiljelinjen gäller därför hur långt kommittén bör gå *de lege ferenda.* En riktning är att skapa standardiserade samtyckesvägar och institutioner för identifiering, offentliga

[6] Antagna av kommissionen vid dess femtiotredje session år 2001. Artikelutkasten återges i bilagan till FN:s generalförsamlings resolution 56/83 av den 12 december 2001, med de rättelser som anges i dokument A/56/49 (vol. I)/Corr.4.

Utkastet till artikel 24 har följande ordalydelse:

Article 24 — Distress

1. The wrongfulness of an act of a State not in conformity with an international obligation of that State is precluded if the author of the act in question has no other reasonable way, in a situation of distress, of saving the author's life or the lives of other persons entrusted to the author's care.

2. Paragraph 1 does not apply if:

(a) the situation of distress is due, either alone or in combination with other factors, to the conduct of the State invoking it; or

(b) the act in question is likely to create a comparable or greater peril.

[7] Utkastet till artikel 25 har följande ordalydelse:

Article 25 — Necessity

1. Necessity may not be invoked by a State as a ground for precluding the wrongfulness of an act not in conformity with an international obligation of that State unless the act:

(a) is the only way for the State to safeguard an essential interest against a grave and imminent peril; and

(b) does not seriously impair an essential interest of the State or States towards which the obligation exists, or of the international community as a whole.

2. In any case, necessity may not be invoked by a State as a ground for precluding wrongfulness if:

(a) the international obligation in question excludes the possibility of invoking necessity; or

(b) the State has contributed to the situation of necessity.

underrättelser och efterhandsgranskning. En annan är att prioritera ett multilateralt system eller en internationell organisation som kan fatta eller förmedla beslut. Båda riktningarna kräver att de centrala begreppen håller för juridisk och teknisk prövning. Där möts Arbetsgrupp 2 av Arbetsgrupp 3.

23 Det diskussionsunderlag som Arbetsgrupp 2 överlämnade till kommittén för vidare beredning återges nedan på sidorna 073–095.

06 Arbetsgrupp 3: definitioner som rättslig arkitektur

24 Arbetsgruppen om definitioner består av Theuns Kotzé (brittiska avdelningen), Rada Popova (tyska avdelningen), Marie-Clotilde Runavot (franska avdelningen), Gábor Sulyok (ungerska avdelningen) och mig. Efter gruppens videomöte den 26 juni 2026 utsågs jag till samordnare. Uppgiften är viktig av ett enkelt skäl: kommitténs alla andra förslag förutsätter att samma ord bär samma rättsliga betydelse. Definitioner är inte etiketter. De fungerar som rättsliga strömbrytare. Några ord kan bevara ett objekts fördragsstatus, ange vilken stat som måste kontaktas, utlösa tillstånd eller underrättelse, bestämma vilken bevisning som krävs och göra en tjänst möjlig att upphandla, försäkra och verifiera.

25 FN:s fem rymdrättsliga traktater ger inte någon färdig ordlista för dagens verksamhet. Medan »utsändande stat»[8] och »registerförande stat»[9] får fördragsanknutna förklaringar i 1972 års ansvarskonvention[10] och 1975 års registreringskonvention,[11] nämner samma traktater exempelvis att »rymdföremål» omfattar beståndsdelar av ett rymdföremål liksom också dess bärraket och delar därav, dock utan att ge en uttömmande definition.[12] Ett intressant fall utgörs artikel 6 i 1967 års rymdfördrag, vars autentiska texter på engelska, franska, kinesiska, ryska och spanska rymmer ett latent definitionsproblem – som inte alls ger sig till känna i bestämmelsens översättning till svenska, vilken ej äger vitsord. I sin engelska text använder rymdfördraget lokutionen »*appropriate State Party to the Treaty*» i artikel 6 utan att definiera vilken anknytning som gör en fördragsslutande stat »*appropriate*». Den svenska översättningen begagnar sig av termen »vederbörande fördragsslutande stat», vars betydelse inte öppnar för frågan, hur en fördragsslutande stats lämplighet definieras i de autentiska språkversionerna.[13] Artikel 9 kräver »veder-

[8] Jfr artikel 1:*b* i 1972 års ansvarskonvention samt artikel 1:*a* i 1975 års registreringskonvention

[9] Se artikel 1:*c* i 1975 års registreringskonvention.

[10] *Konventionen om internationellt ansvar för skada som orsakas av rymdföremål (SÖ 1976:35).*

[11] *Konventionen om registrering av föremål som har sänts ut i yttre rymden (SÖ 1976:43).*

[12] Jfr artikel 1:*d* i 1972 års ansvarskonvention samt artikel 1:*b* i 1975 års registreringskonvention.

[13] Artikel 6 har följande ordalydelse i den svenska översättningen av 1967 års rymdfördrag:

Fördragsslutande stater bär internationellt ansvar för såväl statlig som icke-statlig verksamhet i yttre rymden, däri inbegripet månen och övriga himlakroppar, och för att denna äger rum i överensstämmelse med bestämmelserna i detta fördrag. Verksamhet som bedrivs i yttre rymden, däri inbegripet månen och övriga himlakroppar, av icke-statliga →

börligt hänsynstagande» och talar om potentiellt »skadliga störningar» utan att fullt utveckla normernas räckvidd.[14] Enligt artikel 3 i 1972 års ansvarskonvention grundas en utsändande stats ansvar för skada i rymden endast om »fel eller försummelse» kan tillskrivas densamma eller en person som den är ansvarig för – emellertid utan att definiera standarden för vad som utgör fel eller försummelse.[15] Själva begreppen rymdskrot, rymdskrotsanering, verifierad sanering och skrot med obestämbar registreringsstat saknas helt i fördragen.

26 Den 13 juli 2026 antog arbetsgruppen *Working Paper #01 »Working Method, First-Year Phases, Legal-Source and Standards Inventory, and Preliminary Catalog of Terms»*, infört i **bilaga 5** (sidorna 26–40) och här särskilt återgivet som **bilaga 6** nedan på sidorna 097–111, som etablerade en metod med successiv och dokumenterad avgränsning. Arbetet delades i fyra faser: inventering, taxonomi och terminologiskt urval, utformning samt validering. Inventeringen omfattar traktaterna, FN-resolutioner, COPUOS-riktlinjer, IADC-, ISO-, ECSS- och ESA-material, branschpraxis, säkerhetsrättsliga manualer och ett urval nationella tillståndssystem.[16] Den skall vara en levande källkarta, inte en bibliografi som växer utan styrning.

27 Begreppen sorterades i fem materiella kluster. Det första gäller fördragsanknuten status: rymdföremål, komponentdel, uppskjutande stat, registreringsstat, ägare och operatör. Det andra gäller rymdskrotets status och attribution. Det tredje gäller själva saneringS- och

juridiska personer skall kräva tillstånd och kontinuerlig övervakning av vederbörande fördragsslutande stat. När verksamhet bedrivs i yttre rymden, däri inbegripet månen och övriga himlakroppar, av en internationell organisation, skall ansvaret för att detta fördrag efterlevs bäras av såväl den internationella organisationen som av de i organisationen deltagande stater som är parter i detta fördrag.

Se närmare härom Scarlet Sarah O'Donnell: *International Responsibility for Activities in Outer Space in the Modern Space Age. Article VI of the Outer Space Treaty in the Context of International Space Law and Public International Law*. Lund: Lunds universitet, 2023; s 231–236.

[14] Artikel 9 har följande ordalydelse i den svenska översättningen av 1967 års rymdfördrag:

Vid utforskandet och utnyttjandet av yttre rymden, däri inbegripet månen och övriga himlakroppar, skall fördragsslutande stater ledas av principerna om samarbete och ömsesidigt bistånd; de skola bedriva all verksamhet i yttre rymden, däri inbegripet månen och övriga himlakroppar, under vederbörligt hänsynstagande till andra fördragsslutande staters intresse. Fördragsslutande stater skall bedriva studier av yttre rymden, däri inbegripet månen och övriga himlakroppar, och utföra forskningar av denna på ett sådant sätt att skadlig nedsmutsning undvikes liksom även ogynnsamma förändringar i jordens omgivningar genom att utomjordisk materia tillföres denna; staterna skall, där så är nödvändigt, vidtaga erforderliga åtgärder i detta syfte. Om fördragsslutande stat har anledning förmoda att en verksamhet eller ett experiment som planeras av staten eller dess medborgare, i yttre rymden, däri inbegripet månen och övriga himlakroppar, kunde tänkas leda till skadliga störningar i andra fördragsslutande staters fredliga utforskande och utnyttjande av yttre rymden, däri inbegripet månen och övriga himlakroppar, skall den förra staten föranstalta om erforderligt internationellt samråd innan den igångsätter dylik verksamhet eller dylikt experiment. Fördragsslutande stat, som har anledning förmoda att verksamhet eller experiment, som annan fördragsslutande stat planerar i yttre rymden, däri inbegripet månen och övriga himlakroppar, kunde tänkas leda till skadliga störningar i det fredliga utforskandet och utnyttjandet av yttre rymden, däri inbegripet månen och övriga himlakroppar äger påkalla samråd rörande dylik verksamhet eller dylikt experiment.

[15] Artikel 3 har följande ordalydelse i den svenska översättningen av i 1972 års ansvarskonvention:

Om skada annorstädes än på jordens yta tillfogas en utsändande stats rymdföremål eller person eller egendom ombord på ett sådant rymdföremål av en annan utsändande stats rymdföremål, skall sistnämnda stat vara ansvarig endast om skadan kan tillskrivas fel eller försummelse av den staten eller av person som den är ansvarig för.

[16] Se **bilaga 5** §§ 11–12 på sidorna 099–108.

uppdragsverksamheten. Det fjärde gäller tillstånd, samtycke och ansvar. Det femte gäller kommersiell tillämpning, bevisning och genomförande. Varje »definitionskandidat» skall dessutom prövas utifrån rättsligt ursprung, funktion, rättsföljd, mognad och lämplig placering i en operativ definition, kommentar, teknisk ordlista eller förteckning över uppskjutna frågor.

28 Arbetsgruppen föreslog en trelagersprodukt: ett kort definitionsavsnitt för juridiskt operativa termer, en tolkningskommentar för fördragskontinuitet och känsliga vägval samt en teknisk eller operationell ordlista som kan utvecklas i takt med standarder och uppdrag. Konstruktionen skyddar både rättslig stabilitet och teknisk rörlighet. Den minskar risken för att en snabbt föråldrad tröskel fryses i juridisk text eller att en kontroversiell materiell regel göms i en till synes neutral definition.

29 Inför Wien utvecklade Gábor Sulyok och jag **ett gemensamt diskussionsunderlag under titeln** ***»From Taxonomy to Draft Definitions»***, som återges som **bilaga 7**. Det var uttryckligen en idéskrift och ett operativt förslag, inte ett av arbetsgruppen eller kommittén antaget dokument. Underlaget prioriterar begrepp efter utformningsmognad. En första omgång omfattar bland annat aktiv borttagning, uppskjutningsmyndighet, uppskjutande stat, ägare, återinträde, rymdskrot, rymdskrotsminskning, rymdskrotsanering, rymdföremål och registreringsstat. En stödjande omgång omfattar tillskrivning (*attribution*), tillstånd, operatör och verifiering. Kontroversiella frågor om samtyckesmodaliteter, åtgärder vid svårt trångmål, olycka, nödläge eller nödvändighet, fel, skadlig störning, dubbelanvändning och övergivande hålls synliga men skjuts upp tills kommittén har behandlat den materiella regeln.

30 Idéskriftens mest praktiska innovation är ett universellt definitionskort. Kortet börjar med termen och ett definitionsförslag. Därefter prövas parallellt den avsedda rättsliga funktionen, bindande källor, icke-bindande källor och praxis, objektiva indikatorer, angränsande begrepp, politisk och juridisk känslighet, placering och ändringshistorik. I en annan granskningsomgång testas fördragskontinuitet och dolda policyval. Gruppens kommentarer sorteras som samtycke, svårighet, alternativ formulering eller ytterligare källa. Metoden gör oenighet synlig innan ordalydelsen stelnar.

31 Två relationer är vägledande. För det första bör rymdskrot beskrivas som en regleringsstatus som kan knytas till ett rymdföremål, inte som en ny föremålskategori frikopplad från de rymdrättsliga fördragen. Klassificeringen får inte i sig påverka ägande, registrering, domsrätt och kontroll eller ansvar. För det andra bör rymdskrotsanering tills vidare fungera som paraplybegrepp och aktiv borttagning som en underkategori. Då ryms även stabilisering, passivering, ompositionering och kontaktlös riskminskning utan att varje operation felaktigt beskrivs som fångst och permanent avlägsnande.

32 Samordningsuppdraget ger Svenska ILA en viss nyckelposition. Arbetsgruppens vokabulär kommer att användas av de andra grupperna när de skriver om normativ form, samtycke, tillstånd, ansvar, försäkring och incitament. Svenskt deltagande befinner sig därför i kommittéarbetets gångjärn. Uppgiften är att förena folkrättslig precision med den typ av objektiva, verifierbara kriterier som tekniker, myndigheter och marknadsaktörer faktiskt kan använda.

33 Definitionsarbetet får sitt verkliga värde först när ordalydelsen utsätts för situationer som liknar faktiska uppdrag. Arbetsplanen föreslår därför att färdiga definitionskort prövas mot minst fem typer av scenarier:

- Det första är borttagande av en registrerad, uttjänt satellit med uttryckligt samtycke. Där kan man testa om begreppen för operatör, tillstånd, registreringsstat, ägare och verifierad prestation fungerar tillsammans utan att blanda ihop statens jurisdiktion med den civilrättsliga äganderätten.
- Det andra scenariot gäller ett spårat och tekniskt karakteriserat objekt vars registreringsstat inte kan fastställas med tillräcklig säkerhet. Här blir skillnaden mellan fysisk identifiering, juridisk attribution och ägarlöshet avgörande. En definition av skrot med obestämbar registreringsstat måste beskriva ett bevisläge efter rimliga och dokumenterade efterforskningar – inte skapa en fiktion om att jurisdiktion och ägande har upphört.
- Det tredje scenariot är en kontaktlös riskminskningsåtgärd, exempelvis en metod som förändrar rörelsemängd utan fysisk fångst. Det visar varför sanering behöver vara bredare än aktiv borttagning och varför teknisk neutralitet är en rättslig dygd.
- Det fjärde scenariot är ett kontrollerat återinträde. En operation som minskar kollisionsrisken i omloppsbana kan överföra risk till atmosfären och jordytan. Begrepp som säker avveckling, slutläge och verifierad sanering måste därför kunna bära uppgifter om överlevande fragment, personrisk, miljöpåverkan och ansvar.
- Det femte scenariot är ett delvis misslyckat uppdrag: objektet stabiliseras men når inte avsett slutläge, eller uppdraget skapar nya fragment. Då måste juridiken skilja mellan teknisk delprestation, avtalsenlig prestation, behörighet att agera och full efterlevnad av säkerhets- och ansvarsnormer.

34 Scenarioprövningen är inte en teknisk kontroll som jurister överlåter åt ingenjörer. Den är en metod för att upptäcka var en elegant definition döljer en materiell regel, bygger på ett omätbart kriterium eller faller sönder när tillskrivning, tidsnöd och ofullständiga data kommer in i bilden. På så sätt kan arbetsgruppen hålla fast vid folkrättens struktur och samtidigt undvika begrepp som ingen tillståndsmyndighet, operatör eller försäkringsgivare kan använda i praktiken.

07 Arbetsgrupp 4: incitament och en möjlig marknad

35 Rymdskrotsanering är dyr, tekniskt riskfylld och har ännu ingen självklar betalande kund. Arbetsgrupp 4 undersökte därför mekanismer som kan göra ansvarsfullt beteende ekonomiskt rationellt. Förslagen omfattar återbetalningsbara saneringssäkerheter vid uppskjutning, skatte- eller avgiftslättnader, krediter för finansierad borttagning och nationella, regionala eller internationella fonder. Även standardiserade gränssnitt, hållbarhetsbetyg, certifiering och försäkringsvillkor kan verka som incitament.

36 Här uppstår en principiell fråga om kommitténs slutprodukt. En del förslag är tydligt rättsliga, exempelvis tillståndsvillkor, finansiellt ansvar och verifiering. Andra är industri- och marknadspolitik. Om allt förs in i samma operativa text kan det minska staters vilja att stödja helheten. En möjlig lösning är samma skiktning som återkommer i övriga grupper: rättsliga kärnregler, förklarande kommentar och en särskild policy- eller genomförandedel. Också här är definitionerna avgörande. Ett system med kompensationskrediter för borttagning av rymdskrot, ett prestationsvillkor eller en försäkringsutbetalning kräver ett avgränsat begrepp för vem som utfört vad, mot vilket mål och med vilken verifiering.

37 Det diskussionsunderlag som Arbetsgrupp 4 överlämnade till kommittén för vidare beredning återges nedan på sidorna 113–115.

08 Wien 2026: mellanrapport, inte slutpunkt

38 ILA:s 82:a internationella konferens ägde rum i Wien den 17–21 augusti 2026 under temat *»Contours of International Law: Encounters and Evolutions»*. Kommitténs slutna arbetsmöte hölls den 18 augusti vid Wienuniversitetets juridiska fakultet. Underlaget bestod av de fyra arbetsgruppernas texter, en konsoliderad promemoria och särskilda presentationer. För arbetsgrupp 3 redovisade jag *Working Paper #01,* den metodiska övergången till fas 2 samt den gemensamma idéskriften, författad tillsammans med Gábor Sulyok, och i synnerhet dess koncept av ett definitionskort, medan Gábor Sulyok presenterade den prioriterade provisoriska definitionsförteckningen.

39 Wienunderlaget visar fyra gemensamma linjer:

- För det första föredrar flera grupper stegvisa och skiktade lösningar framför ett omedelbart globalt fördrag.
- För det andra är samtycke den rättsliga knutpunkten för tredje mans verksamhet.
- För det tredje återkommer behovet av institutioner: register, kontaktpunkter, underrättelseförfaranden, kvalificerade licensmyndigheter och oberoende verifiering.

- För det fjärde måste terminologin hållas samman med den snabba utvecklingen inom ISO, IADC, ESA, ITU och faktiska demonstrationsuppdrag.

40 Mötet var inte avsett att anta en slutlig ordlista eller en fullgången folkrättslig redogörelse. För Arbetsgrupp 3 var målet att få vägledning om metod, prioritetsordning, sambandet mellan sanering och aktiv borttagning samt ett uttryckligt förbehåll som skyddar artikel 8-status. Idéskriften hade cirkulerats före Wien men saknade officiell ställning och skulle kunna bli ett arbetsgruppsdokument först efter revidering, ny cirkulation och ett uttryckligt beslut inom gruppen. Detta förfarande är viktigt: dynamik får inte vinnas på bekostnad av inkludering och konsensusbyggande.

41 Det saknas ännu ett publicerat, officiellt konferensprotokoll för kommitténs Wienmöte; ILA anger att den samlade konferensrapporten kommer att publiceras år 2027. Slutsatserna här bör därför läsas som en redogörelse för det dokumenterade förstaårsarbete som lades fram och om riktningen i överläggningarna, inte som en slutlig analys av antagna kommittéståndpunkter.

09 En svensk rymdrättslig kontinuitet

42 Svenska ILA:s roll i arbetsgruppen om definitioner har en föregångare värd en särskild vördnadsbetygelse. **Niklas Hedman** har under årtionden hört till Sveriges mest framstående rymdrättsliga diplomater och internationella tjänstemän. Före sin tid vid FN representerade han Sverige i COPUOS under ett decennium och deltog bland annat i arbetet med registreringspraxis och UNISPACE III-uppföljningen. Vid UNOOSA var han under nära arton år chef för kommitté-, policy- och rättsfrågorna, sekreterare för COPUOS och dess båda underkommittéer samt senare tillförordnad direktör. Han är numera COSPAR:s chefsjurist.

43 **Niklas Hedman** bidrog också till ILA:s tidigare rymdrättskommitté. Bland annat författade han inledande och särskilda rapportunderlag inför den internationella konferensen i Berlin 2004 om fjärranalysens rättsliga frågor. Hans arbetssätt – att förena juridisk exakthet med diplomati, vetenskap och den operativa kedjan bakom rymddata – är en naturlig förebild för dagens kommitté. Den nuvarande svenska samordningsrollen är därför inte ett isolerat uppdrag, utan en fortsättning på en respekterad svensk tradition av att översätta teknikens realiteter till internationellt användbar rätt.

44 Det svenska mervärdet kan bli ännu större om rapporteringen tillbaka till den nationella rymdgemenskapen sker regelbundet. Ingenjörer och operatörer kan uppmärksamma tekniska antaganden som juridiken annars missar. Rymdföretag och försäkringsaktörer kan förklara vilka begrepp som måste vara mätbara för att avtal och riskmodeller skall fungera. Myndigheter kan

bidra med erfarenhet av tillstånd, register, säkerhetsskydd och internationell samordning. Svenska ILA kan här fungera som en mötesplats mellan folkrätten och rymdsektorns praktiker.

10 Bedömning och nästa steg

45 Kommitténs första arbetsår har inte löst rymdskrotsfrågan. Det har däremot gjort något mer grundläggande: det har avgränsat vilka beslut som måste fattas, vilka rättsliga missförstånd som måste undvikas och hur arbetet kan föras från allmän problemformulering till genomförbara texter. Den viktigaste insikten är att sanering inte kan regleras som en isolerad miljötjänst. Den måste bäddas in i ett system för tillskrivning, samtycke, tillstånd, tillsyn, informationsskydd, ansvar och verifiering.

46 Efter Wien bör Arbetsgrupp 3 först slutföra sin metod och den första omgången definitionskort. Fördragsanknutna och relativt konsensusfähiga termer bör behandlas före begrepp som i praktiken avgör om ensidig verksamhet är tillåten. Därefter behövs riktad återkoppling från arbetsgrupperna om normativt instrument, tredje mans borttagande och incitament. Under 2027 bör definitionerna prövas mot realistiska scenarier: ett registrerat uttjänt objekt med uttryckligt samtycke, ett objekt med oklar registreringsstat, en kontaktlös riskminskningsåtgärd, ett kontrollerat återinträde och ett delvis misslyckat uppdrag.

47 För Svenska ILA innebär samordningsuppdraget ett ansvar att både bidra och lyssna. Kommittén behöver svensk rymdteknisk, myndighetsrelaterad, kommersiell och juridisk erfarenhet. Samtidigt erbjuder arbetet en tidig inblick i vilka regler som kan forma framtida saneringstjänster, service av rymdfarkoster i omloppsbana (*in-orbit servicing*) och rymdtrafikledning. Det är ett område där rättslig klarhet kan minska säkerhetsrisker, sänka transaktionskostnader och göra samarbete möjligt utan att urholka staters rättigheter.

48 Den fråga som öppnade denna redogörelse kvarstår: vem får flytta någon annans satellit? Det korta svaret är i dag att den tekniskt kapabla aktören normalt behöver en rättsligt behörig stat, ett giltigt tillstånd, ett säkert samtyckesspår och en verifierbar operation. Kommitténs uppgift är att göra det längre svaret tillräckligt klart för att stater, myndigheter och företag faktiskt skall kunna använda det. Det är därför arbetet är angeläget – och därför det i grunden handlar om hur statlig kompetens, gemensam tillgång och teknisk handlingsförmåga skall samexistera i en allt trängre omloppsmiljö.

49 Tre svenska uppföljningsspår framstår som särskilt värdefulla. Det första gäller tillstånd och register. Sverige har anledning att följa hur framtida nationell rymdlagstiftning kan hantera saneringsnära verksamhet, fortlöpande tillsyn, ansvarsförsäkring, säkerhetsskydd och uppgifter om ägande och kontroll. Det andra gäller teknik och bevisning. Svenska aktörer inom rymdläges-

bild, sensorer, autonomi och dataanalys kan bidra till att precisera vad som utgör rimliga identifieringsförsök, säker närmandeförmåga och ett verifierat slutläge. Det tredje gäller den kommersiella strukturen: vem beställer en saneringstjänst, hur fördelas riskerna och vilka data kan delas utan att skyddsvärd teknik röjs?

50 En svensk dialog behöver därför inte invänta en färdig ILA-resolution. Den kan redan nu pröva kommitténs begrepp mot svenska och europeiska uppdrag, tillståndsförfaranden och affärsmodeller. Resultatet kan föras tillbaka till arbetsgruppen som konkreta exempel på var en definition är för bred, för snäv eller omöjlig att verifiera. På så sätt blir återrapporteringen från Wien början på ett kunskapsutbyte, inte slutet på en konferensresa.

11 Bilaga 1: Kommitténs mandat på engelska och svenska

Proposal for
an ILA Committee on Space Law:
Legal Aspects of
Space Debris Remediation

Submitted by Prof. Dr Stephan Hobe (German Branch)

Summary of Work Program

1. The new Space Law Committee will pursue a four (4) year work program with the aim of developing a Resolution clarifying the legal problematic surrounding space debris remediation or active debris removal (ADR) and proposing solutions to the identified issues that can be directly implemented by international as well as national legislators.

2. The Chair proposes the following four (4) year work program outline:

(1) In the first year, the relevant legal instruments already in existence, both international as well as national, and both hard- and soft-law in nature, will be gathered and a discussion between members of the Committee initiated. Additionally, the Committee will gather pertinent practical information on technology, industry trends and governmental initiatives as well as research into the political stance to ADR, both on international and national plane.

(2) In the second year, a Report summarizing the work of the Committee will be produced, outlining the first findings of the Committee with regards to the relevant legal instruments and the problems these might present.

(3) In the third year, working with the aid of

Förslag till
en ILA-kommitté om rymdrätt:

Rättsliga aspekter av rymdskrotsanering

Inlämnat av prof. dr Stephan Hobe (tyska avdelningen)

Sammanfattning av arbetsprogrammet

1. Den nya rymdrättskommittén kommer att genomföra ett fyraårigt arbetsprogram med målet att utarbeta en resolution som klargör de juridiska problemen kring sanering av rymdskrot eller aktiv sanering av rymdskrot (ASR) och föreslå lösningar på de identifierade problemen som kan genomföras direkt av internationella och nationella lagstiftare.

2. Ordföranden föreslår följande fyraåriga arbetsprogram:

(1) Under det första året kommer relevanta befintliga rättsliga instrument, både internationella och nationella, och både hårda och mjuka lagar, att samlas in och en diskussion mellan kommittémedlemmarna inledas. Dessutom kommer kommittén att samla in relevant praktisk information om teknik, branschtrender och statliga initiativ samt undersöka den politiska hållningen till ASR, både på internationell och nationell nivå.

(2) Under det andra året kommer en rapport som sammanfattar kommitténs arbete att tas fram, med en översikt över kommitténs första slutsatser om relevanta rättsliga instrument och de problem som dessa kan medföra.

(3) Under det tredje året kommer kommitté-

the Committee Report, the Committee members will start proposing and researching possible solutions, keeping in mind both legal and practical elements of the nascent technological field and accompanying (commercial) sector, including relevant geo-politically sensitive questions.

(4) In the fourth and final year, these proposals will be gathered in a Resolution of the Committee and presented for adoption to the ILA. The final outcome will be structured in an easy to implement Manual to aid international and national legislators in regulating without unnecessary constraints a nascent private sector and navigating international geo-political landscape affected by ADR, akin to the 2012 ILA Sofia Guidelines on National Space Legislation drafted by the former ILA Space Law Committee.

ledamöterna, med hjälp av kommitténs rapport, att börja föreslå och undersöka möjliga lösningar, med hänsyn till både rättsliga och praktiska aspekter av det nya teknikområdet och den tillhörande (kommersiella) sektorn, inklusive relevanta geopolitiskt känsliga frågor.

(4) Under det fjärde och sista året kommer dessa förslag att samlas i en resolution från kommittén och läggas fram för antagande av ILA. Det slutliga resultatet kommer att struktureras i en lättanvänd handbok för att hjälpa internationella och nationella lagstiftare att reglera den nya privata sektorn utan onödiga begränsningar och navigera i det internationella geopolitiska landskapet som påverkas av ASR, i likhet med ILA:s år 2012 antagna Sofia-riktlinjer för nationell rymdlagstiftning som utarbetades av den tidigare ILA-kommittén för rymdrätt.

Statement of the Problem

Problemformulering

3. Satellite operations such as satellite navigation, imagery (remote sensing/Earth observation), and telecommunications are being used across all sectors to aid in global transport, banking, information exchange, connectivity, communication, trade, disaster management, agriculture planning, military operations, State defense, critical infrastructure etc. However, satellite systems providing these space services are under threat from space junk or space debris. Space debris does not have an internationally accepted legal definition but is normally (technically) understood as man-made non-functional objects and parts thereof. Space debris is

3. Satellitverksamhet såsom satellitnavigering, bildtagning (fjärranalys/jordobservation) och telekommunikation används inom alla sektorer för att underlätta global transport, bankverksamhet, informationsutbyte, konnnektivitet, kommunikation, handel, katastrofhantering, jordbruksplanering, militära operationer, statligt försvar, kritisk infrastruktur o s v. Satellitsystem som tillhandahåller dessa rymdtjänster hotas dock av rymdskräp eller rymdskrot. Rymdskrot har ingen internationellt accepterad juridisk definition, men förstås normalt (tekniskt) som icke-funktionella föremål och delar därav som skapats av människan. Rymdskrot är därför en normal följd av

therefore a normal consequence of space activity, with old disused satellites and launcher parts, and other parts thereof such as paint chips etc. making up the on-orbit debris population. These objects travel with a speed of approx. 10–16 km/s thus presenting a lethal threat to any active object regardless of their size and mass, as shown by past examples such as the 2009 collision of inactive (debris) Kosmos 2551 with active Iridium 33, creating a cloud of new debris.

4. According to the European Space Agency (ESA) the debris numbers as of August 2024 are as follows: 40,500 objects greater than 10 cm, 1,100,000 objects between 1 and 10 cm, 130 million objects between 1 mm and 1 cm.[1] The numbers are predicted to rise with the increase of launches and space activity.[2] As debris creates more debris, in what is known as the Kessler syndrome, humanity could even be cut off from outer space if nothing is done to battle the threat. The space debris issue is therefore the most pressing issue of contemporary space exploration and use, endangering future space operations.[3]

5. The existing UN space treaties (the 1967 Outer Space Treaty, the 1968 Rescue

rymdaktivitet, där gamla, uttjänta satelliter och delar av bärraketer samt andra delar därav, såsom färgflagor o s v, utgör skrotansamlingar i omloppsbana. Dessa föremål färdas med en hastighet på cirka 10–16 sekundkilometer och utgör därmed ett dödligt hot mot alla aktiva föremål, oavsett storlek och massa, vilket framgår av tidigare exempel, såsom kollisionen 2009 mellan den inaktiva (skrot) Kosmos 2551 och den aktiva Iridium 33, som skapade ett moln av nytt skrot.

4. Enligt Europeiska rymdorganisationen (ESA) är antalet rymdskrot i augusti 2024 följande: 40 500 föremål större än 10 cm, 1 100 000 föremål mellan 1 och 10 cm, 130 miljoner föremål mellan 1 mm och 1 cm.[1] Antalet förväntas öka i takt med fler uppskjutningar och ökad rymdaktivitet. Eftersom skrot skapar mer skrot, i det som kallas Kessler-syndromet, kan mänskligheten till och med bli avskuren från yttre rymden om ingenting görs för att bekämpa hotet. Problemet med rymdskrot är därför den mest angelägna frågan inom dagens rymdutforskning och rymdanvändning, och det hotar framtida rymdoperationer.[3]

5. De befintliga FN-fördragen om rymden (1967 års rymdfördrag, 1968 års

[1] ESA, Space Debris by Numbers (https://www.esa.int/Space_Safety/Space_Debris/Space_debris_by_the_numbers).

ESA, Space Debris by Numbers (https://www.esa.int/Space_Safety/Space_Debris/Space_debris_by_the_numbers).

[2] Paul B. Larsen, 'Solving the Space Debris Crisis' (2018) 83 Journal of Air Law and Commerce; BryceTech Reports; Space Foundation The Space Report 2023; SpaceWatch Global, Morgan Stanley Forecasts Space As A Trillion-Dollar Industry by 2024 (https://spacewatch.global/2018/12/morgan-stanley-forecasts-space-as-a-trillion-dollar-industry-by-2040/).

Paul B Larsen, "Solving the Space Debris Crisis" (2018) 83 Journal of Air Law and Commerce; BryceTech Reports; Space Foundation The Space Report 2023; SpaceWatch Global, Morgan Stanley Forecasts Space As A Trillion-Dollar Industry by 2024 (https://spacewatch.global/2018/12/morgan-stanley-forecasts-space-as-a-trillion-dollar- industry-by-2040/).

[3] See for example Lotta Vikkari, *The Environmental Element in Space Law* (2008) Brill.

Se till exempel Lotta Vikkari, The Environmental Element in Space Law (2008) Brill.

Agreement, the 1972 Liability Convention, the 1975 Registration Convention and the 1979 Moon Agreement) do not address space debris directly or fully solve the problematic. Due to this the Inter-Agency Space Debris Coordination Committee (IADC) researched the problematic and developed non-legally binding *Space Debris Mitigation Guidelines* (SDMG), which have since their adoption in 2002, been endorsed by the UN. The SDMG propose measures for the mitigation of space debris, i.e. measures that will help reduce future growth of debris. These are applicable only to new space objects and will help reduce the number of debris accumulating in future, by advising satellite manufactures to *inter alia* minimize debris release during normal operations and ensure passivation of satellites after their useful life to prevent on-orbit explosions.

räddningsavtal, 1972 års ansvarsfördrag, 1975 års registreringskonvention och 1979 års månavtal) behandlar inte rymdskrot direkt och löser inte problemet fullständigt. Därför har Inter-Agency Space Debris Coordination Committee (IADC) undersökt problemet och utarbetat rättsligt icke-bindande **riktlinjer för minskning av rymdskrot** (SDMG), som sedan de antogs 2002 har godkänts av FN. SDMG föreslår åtgärder för att minska rymdskrot, d v s åtgärder som kommer att bidra till att minska den framtida ökningen av skrot. Dessa gäller endast nya rymdobjekt och kommer att bidra till att minska mängden skrot som ackumuleras i framtiden genom att råda satellittillverkare att bland annat minimera utsläpp av skrot under normal drift och säkerställa passivering av satelliter efter deras livslängd för att förhindra explosioner i omloppsbana.

6. However, experts evaluate that mitigation measures will not be sufficient. Space debris remediation or ADR, i.e. the active removal of existing space debris will be required. Some technologies for ADR already exist such as laser-use, harpoons, nets, or tug-satellites that take hold of a debris piece and pull it into a graveyard orbit or release it into Earth atmosphere for re-entry or burn-up in the atmosphere. However, ADR faces some legal challenges. This is primarily fueled by state jurisdiction and ownership rights in space objects, which pursuant to Article VIII[4]

6. *Experter bedömer dock att åtgärder för att mildra effekterna inte kommer att vara tillräckliga. Det kommer att krävas sanering av rymdskrot eller ASR, d v s aktiv borttagning av befintligt rymdskrot. Det finns redan vissa tekniker för ASR, såsom laseranvändning, harpuner, nät eller bogseringssatelliter som fångar upp skrotet och drar det till en gravplatsbana eller släpper det i jordens atmosfär för återinträde eller förbränning i atmosfären. ASR står dock inför vissa juridiska utmaningar. Detta beror främst på statlig jurisdiktion och äganderätt till rymdobjekt, som enligt artikel VIII i*

[4] With regard to jurisdiction, OST, Article VIII declares that the State that nationally registers an object retains jurisdiction and control, bringing the space object situation close to vessels or aircraft in international spaces. See Bin Cheng, Studies in International Space Law, (Clarendon Press, 1997) p. 467.

När det gäller jurisdiktion fastställs i artikel VIII i rymdfördraget [*Fördrag om principer för staternas utforskande och nyttjande av yttre rymden, inklusive månen och andra himlakroppar* (*SÖ 1967:7*)] *att den stat som registrerar ett objekt nationellt*

of the Outer Space Treaty remain unaffected by an object's presence in outer space or by its non-functionality. This means that state jurisdiction and ownership rights remain even in space debris.[5] Therefore, majority opinion seems to be that objects, including space debris, cannot be removed without consent of the registering State and/or object owner.[6] However, States and/or owners may not always be able or willing to give consent for various reasons (trade or state secrets etc.). On national level, injuring ownership rights may result in contractual liability. On the international level, the International Court of Justice declared that an intrusion into the jurisdiction of another State amounts to a violation of international law, incurring state responsibility.[7] Moreover, some objects may be

rymdfördraget[4] inte påverkas av ett objekts närvaro i yttre rymden eller av dess icke-funktionalitet. Detta innebär att statlig jurisdiktion och äganderätt kvarstår även för rymdskrot.[5] Därför verkar den allmänna uppfattningen vara att objekt, inklusive rymdskrot, inte kan avlägsnas utan samtycke från den registrerande staten och/eller objektets ägare.[6] Stater och/eller ägare kan dock inte alltid vara i stånd eller villiga att ge sitt samtycke av olika skäl (handels- eller statshemligheter o s v). På nationell nivå kan kränkning av äganderätten leda till avtalsrättsligt ansvar. På internationell nivå har Internationella domstolen förklarat att ett intrång i en annan stats jurisdiktion utgör ett brott mot internationell rätt, vilket medför statligt ansvar.[7] Dessutom kan vissa föremål vara omöjliga att identifiera, vilket dock,

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behåller jurisdiktion och kontroll, vilket gör att rymdobjektets situation liknar den för fartyg eller flygplan i internationellt luftrum. Se Bin Cheng, Studies in International Space Law, (Clarendon Press, 1997) s 467.

[5] Francis Lyall and Paul B. Larsen, *Space Law: A Treatise,* (Ashgate, 2009) p. 84; Report of the International Interdisciplinary Congress on Space Debris Remediation and On-Orbit Satellite Servicing, Scientific and Technical Subcommittee, 49th Sess., at 31, U.N. Doc. A/AC.105/C.1/2012/CRP,16 (2011). This seems confirmed by State practice – see for example status of non-functional satellites Humanity Star, TS530 Zerkalo, Atlantis, Inflate Sail, Challenger, Skylab 1 and Ice Cube, which can be found on the UNOOSA Index of Objects Launched into Outer Space (status: decayed) (http://www.unoosa.org/oosa/osoindex/search-ng.jspx?lf_id=).

Francis Lyall och Paul B. Larsen, Space Law: A Treatise, (Ashgate, 2009), s 84; Rapport från den internationella tvärvetenskapliga kongressen om sanering av rymdskrot och underhåll av satelliter i omloppsbana, Vetenskapliga och tekniska underkommittén, 49:e sessionen, s. 31, FN-dokument A/AC.105/C.1/2012/CRP,16 (2011). Detta verkar bekräftas av statlig praxis – se till exempel statusen för de icke-fungerande satelliterna Humanity Star, TS530 Zerkalo, Atlantis, Inflate Sail, Challenger, Skylab 1 och Ice Cube, som finns i UNOOSA:s index över objekt som skjutits upp i yttre rymden (status: uttjänta) (http://www.unoosa.org/oosa/osoindex/search-ng.jspx?lf_id=).

[6] See for example Manfred Lachs, *The Law of Outer Space,* (Martinus Nijhoff, 2010) p. 66; Mick Schmidt-Tedd, 'Article VIII' (2009) in Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, Gérardine Meishan Goh (eds.) *The Cologne Commentary on Space Law (Vol. I),* (Carl Heymanns, 2009), p. 156–163; Gordon Chung, '*Jurisdiction and Control Aspects of Space Debris Removal*' (2019), in Annete Froehlich (ed.), *Space Security and Legal Aspects of Active Debris Removal,* (Springer, 2019).

Se till exempel Manfred Lachs, The Law of Outer Space, (Martinus Nijhoff, 2010) s. 66; Mick Schmidt-Tedd, "Article VIII" (2009) i Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, Gérardine Meishan Goh (red.) The Cologne Commentary on Space Law (Vol. I), (Carl Heymanns, 2009), s 156–163; Gordon Chung, "Jurisdiction and Control Aspects of Space Debris Removal" (2019), i Annete Froehlich (red.), Space Security and Legal Aspects of Active Debris Removal, (Springer, 2019).

[7] ICJ, Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), Judgment of 27 December 1986 (ICJ Reports 1986, p. 14).

ICJ, Målet om militära och paramilitära aktiviteter i och mot Nicaragua (Nicaragua mot Amerikas förenta stater), dom 1986-

unidentifiable, which, however, as shown by State practice, does not mean jurisdiction and/or ownership have disappeared. It remains unclear whether (concrete) legal principles exist mandating that States for reasons of environmental protection, necessity, distress or securing free exploration, use and access to the international common area of outer space required by Article I of the Outer Space Treaty, permit space debris remediation. Finally, the Liability Convention mandates that the launching State[8] is internationally liable for any damage caused by its space object. It however remains disputed whether this effectively covers all private launches. Furthermore, the Liability Convention does not seem to include environmental damage in its definition of damage and furthermore requires fault be proven for in-space damage without specifying the term fault. It therefore remains insufficient legal ground for clear practical application and it remains unclear what consequences would face States and operators if a remediation mission went wrong.

7. However, the space debris situation is becoming critical, mitigation measures are proving insufficient as number of launches and objects in orbit increase and action is required. Space debris issues are consistently on the UN outer space agenda, space applications have been declared by the UN critical to sustainable use on Earth, space agencies are

som statlig praxis visar, inte innebär att jurisdiktion och/eller äganderätt har upphört att gälla. Det är fortfarande oklart om det finns (konkreta) rättsliga principer som kräver att staterna, av miljöskyddsskäl, av nödvändighet, i nödfall eller för att säkerställa fri utforskning, användning och tillgång till det internationella gemensamma området i yttre rymden som krävs enligt artikel I i rymdfördraget, tillåter sanering av rymdskrot. Slutligen föreskriver ansvarsfördraget att den uppskjutande staten[8] är internationellt ansvarig för alla skador som orsakas av dess rymdobjekt. Det är dock fortfarande omtvistat om detta effektivt omfattar alla privata uppskjutningar. Vidare verkar ansvarskonventionen inte inkludera miljöskador i sin definition av skada och kräver dessutom att fel kan bevisas för skador i rymden utan att specificera begreppet fel. Det finns därför fortfarande otillräcklig rättslig grund för en tydlig praktisk tillämpning och det är fortfarande oklart vilka konsekvenser stater och operatörer skulle få om ett saneringsuppdrag gick fel.

7. Läget med rymdskrot blir dock alltmer kritiskt, och åtgärderna för att minska det visar sig vara otillräckliga i takt med att antalet uppskjutningar och objekt i omloppsbana ökar. Åtgärder krävs. Frågor om rymdskrot står ständigt på FN:s agenda för yttre rymden, rymdtillämpningar har av FN förklarats vara avgörande för en hållbar användning på

12-27 (ICJ Reports 1986, s 14).

[8] LIAB, Article I(c) declares that four State may be considered Launching State: The State that launches, procures or from whose territory or facility an object is launched.

Artikel I:c i ansvarskonventionen [Konventionen om internationellt ansvar för skada som orsakas av rymdföremål (SÖ 1976:35)] fastställer att fyra stater kan betraktas som uppskjutningsstater: den stat som skjuter upp, anskaffar eller från vars territorium eller anläggning ett föremål skjuts upp.

increasingly aware and actively developing space debris policies and technologies. Therefore, there is urgent need to study the legal landscape surrounding space debris remediation. Presenting an in-depth study of the legal problems surrounding space debris remediation and some proposed solutions will be invaluable for practice and especially industry as several private companies are developing space remediation technologies (for example: ClearSpace, Astroscale, Surrey Satellite Technology Ltd, Northrop Grumman, Kall Morris Inc,). Space debris remediation is projected to become a booming industry in future, with the market valued to reach 0.6 billion USD by 2028 (increase from a valued 0.1 billion USD in 2023).[9]

jorden, och rymdorganisationer blir alltmer medvetna och utvecklar aktivt policyer och tekniker för rymdskrot. Det finns därför ett akut behov av att studera den rättsliga situationen kring sanering av rymdskrot. En fördjupad studie av de rättsliga problemen kring sanering av rymdskrot och några föreslagna lösningar kommer att vara ovärderlig för praktiken och särskilt för industrin, eftersom flera privata företag utvecklar teknik för sanering av rymden (till exempel ClearSpace, Astroscale, Surrey Satellite Technology Ltd, Northrop Grumman, Kall Morris Inc). Sanering av rymdskrot förväntas bli en blomstrande industri i framtiden, med en marknadsvärdering som beräknas nå 0,6 miljarder USD år 2028 (en ökning från 0,1 miljarder USD år 2023).[9]

Mandate and Importance of Committee on Space Law: Space Debris Remediation

Uppdrag och betydelse för kommittén för rymdrätt: Sanering av rymdskrot

8. International space law is composed of five United Nations space treaties that lay the foundations for space exploration and use by humans. However, in an effort to prevent technology from outdating the treaties in a sector where technology and law are closely interlinked, the language of the treaties is general and widely formulated. The subsequent instruments that have evolved space law, have been soft-law in nature, mostly United Nations General Assembly Resolutions focusing on a specific application of space law or re- interpreting the terms

8. Internationell rymdrätt består av fem FN-fördrag som lägger grunden för människans utforskning och användning av rymden. I ett försök att förhindra att tekniken gör fördragen föråldrade i en sektor där teknik och lagstiftning är nära sammankopplade, är fördragens språk dock allmänt och brett formulerat. De efterföljande instrument som har utvecklat rymdlagstiftningen har varit av mjuk rättslig karaktär, främst resolutioner från FN:s generalförsamling som fokuserar på en specifik tillämpning av rymdlagstiftningen eller omtolkar termerna från rymdfördragen.[10] Hittills finns det inget sådant instrument som

[9] Markets and Markets, Space Debris Removal Companies (https://www.marketsandmarkets.com/ResearchInsight/space-debris-removal-market.asp).

Markets and Markets, Space Debris Removal Companies (https://www.marketsandmarkets.com/ResearchInsight/space-debris-removal-market.asp).

from the space treaties.[10] So far, no such instrument addresses the legal aspects of space debris remediation. Therefore, the proposed work and subsequent Resolution of the proposed Committee will contribute significantly to the development of international law by gathering all relevant aspects of ADR and analyzing the legal aspects of this growing and important sector.

9. Space debris remediation is becoming an increasingly important topic on a national as well as international sphere. With space activities growing at an exponential and previously unprecedented pace, experts are evaluating that space debris mitigation, even at 100% compliance, will no longer be sufficient to ensure long-term sustainability of outer space, its activities and the accessibility of Earth orbits. Considering that satellite applications are incorporated into crucial Earth infrastructure, have been declared by the United Nations as essential to sustainability on Earth and are being used daily by millions of user worldwide, ranging from banking systems, stock markets, global transport services, health services, State defense and disaster management, loss of accessibility to Earth orbits and a stop to satellite services would endanger the modern way of life with possible apocalyptic consequences. Space sustainability is therefore regularly discussed at United Nations as well as national level. Space debris remediation is being pursued by governmental and commercial actors in a race for technology; however, an examination

behandlar de rättsliga aspekterna av sanering av rymdskrot. Därför kommer det föreslagna arbetet och den efterföljande resolutionen från den föreslagna kommittén att bidra väsentligt till utvecklingen av internationell rätt genom att samla alla relevanta aspekter av alternativ tvistlösning och analysera de rättsliga aspekterna av denna växande och viktiga sektor.

9. Sanering av rymdskrot blir ett allt viktigare ämne både på nationell och internationell nivå. Med rymdaktiviteter som växer i en exponentiell och tidigare oöverträffad takt, bedömer experter att minskning av rymdskrot, även vid 100 % efterlevnad, inte längre kommer att vara tillräckligt för att säkerställa långsiktig hållbarhet i yttre rymden, dess aktiviteter och tillgängligheten till jordens omloppsbanor. Med tanke på att satellitapplikationer är integrerade i viktig infrastruktur på jorden, har förklarats av FN som väsentliga för hållbarheten på jorden och används dagligen av miljontals användare världen över, inom allt från banksystem, aktiemarknader, globala transporttjänster, hälsovård, statligt försvar och katastrofhantering, skulle förlust av tillgänglighet till jordens omloppsbanor och ett stopp för satellittjänster äventyra det moderna livet med möjliga apokalyptiska konsekvenser. Hållbarhet i rymden diskuteras därför regelbundet både i FN och på nationell nivå. Sanering av rymdskrot eftersträvas av statliga och kommersiella aktörer i en kapplöpning om teknik, men en granskning av det internationella rättsliga ramverket kommer att vara avgörande

[10] For more see Stephan Hobe, Space Law: A Handbook (2nd ed., 2023), pp. 40–50.

För mer information se Stephan Hobe, Space Law: A Handbook (2:a upplagan, 2023), s 40–50.

of the international legal framework will be crucial in enabling the wide and rapid utilization of these technologies.

10. Proposed outcomes will seek to address the concerns of the international community regarding use of ADR technologies such as questions of State jurisdiction or liability involving third- party objects, including dual use aspects, or concerns regarding the evolution of private ADR industry and authorization of its activities. The Resolution produced in the end will endeavor to present viable proposals and solutions that 1) international and national legislator will be able to implement and 2) will lend much needed transparency to ADR activities, making the endeavor more a) internationally accepted way of maintaining a sustainable space environment and b) making the nascent ADR industry attractive to investors, who are presently discouraged from investing due to a lack of legal certainty and transparency in the sector.

Previous Work of the ILA

11. The former Space Law Committee has been one of the oldest and longest running committees of the ILA, that produced numerous resolutions of significant importance and influence for doctrine and practice. For example:

(1) **Five Reports on the »Legal Aspects of the Privatization and Commercialization of Space Activities«** focusing specifically on Remote Sensing (RS) and National Space Legislation (NSL) in 2006 in Toronto (presented to

för att möjliggöra en bred och snabb användning av dessa tekniker.

10. De föreslagna resultaten kommer att syfta till att ta itu med det internationella samfundets farhågor när det gäller användningen av ASR-teknik, såsom frågor om statlig jurisdiktion eller ansvar som rör tredje parts objekt, inklusive aspekter av dubbel användning, eller farhågor när det gäller utvecklingen av den privata ASR-branschen och godkännandet av dess verksamhet. Den resolution som slutligen antas kommer att sträva efter att presentera genomförbara förslag och lösningar som 1) internationella och nationella lagstiftare kommer att kunna genomföra och 2) kommer att ge ASR-verksamheten den transparens som så väl behövs, vilket gör satsningen mer a) internationellt accepterad som ett sätt att upprätthålla en hållbar rymdmiljö och b) gör den framväxande ASR-branschen attraktiv för investerare, som för närvarande avskräcks från att investera på grund av bristande rättssäkerhet och transparens inom sektorn.

ILA:s tidigare arbete

11. Den tidigare kommittén för rymdrätt har varit en av ILA:s äldsta och mest långlivade kommittéer, som har tagit fram ett stort antal resolutioner av stor betydelse och inflytande för doktrin och praxis. Till exempel:

(1) ***Fem rapporter om »Rättsliga aspekter av privatisering och kommersialisering av rymdaktiviteter»*** *med särskilt fokus på fjärranalys (FA) och nationell rymdlagstiftning (NRL) år 2006 i Toronto (presenterade för FN:s COPUOS*

the UN COPUOS in 2007 and published as an Annex to the *Report on the contribution of the ILA to the development of space law* which is requested annually by the UN, see **UN Doc. A/AC.105/C.2/L.265.A**), extending to include Registration Issues, New Developments on Space Debris and Dispute Settlement related to Space Activities in 2008 in Rio De Janeiro, in 2010 (with special focus on the value of satellite data, space debris and associated collisions), and finishing in 2012 with presentation of the Fifth Report in Sofia.

(2) The Fifth and **Final Report on the Legal Aspects of the Privatization and Commercialization of Space Activities** was presented alongside **Resolution No. 6/2012 (Sofia Guidelines for a Model Law on National Space Legislation)** in 2012 in Sofia. The Sofia Guidelines have since then been endorsed by the UN COPUOS (see **UN Doc. A.AC.105/C.2/2013/CRP.6**).

(3) The Committee's mandate was thereafter extended to focus on Non-orbital Flight Activities with a view to proposing a specific legal framework for the activity to aid international and national legislators. The work of the Committee was presented in 2024 in Athens as **Resolution No. 05/2024 (Rules on Non-Orbital Spaceflight Activities)**.

12. The former Space Law Committee, however, did not look into the problematic of space debris remediation (i.e., active removal of space debris). This contemporary problematic has begun earnest evolution only in the past few years as technology for the first time enabled serious consideration to be paid to the idea of active debris removal. The

år 2007 och publicerade som bilaga till Rapporten om ILA:s bidrag till utvecklingen av rymdrätten, *som begärs årligen av FN, se* ***FN-dokument A/AC.105/C.2/L.265.A***), *utvidgad till att omfatta registreringsfrågor, nya utvecklingar avseende rymdskrot och tvistlösning i samband med rymdaktiviteter år 2008 i Rio de Janeiro, år 2010* (*med särskilt fokus på värdet av satellitdata, rymdskrot och därmed sammanhängande kollisioner*) *och avslutad år 2012 med presentation av den femte rapporten i Sofia.*

(2) *Den femte och* ***sista rapporten om de rättsliga aspekterna av privatisering och kommersialisering av rymdverksamhet*** *presenterades tillsammans med* ***resolution nr 6/2012*** **(*Sofia-riktlinjerna för en modellag om nationell rymdlagstiftning*)** *i Sofia år 2012. Sofia-riktlinjerna har sedan dess godkänts av FN:s COPUOS* (*se* ***FN-dokument A.AC.105/C.2/2013/CRP.6***).

(3) *Kommitténs mandat utvidgades därefter till att fokusera på icke-orbitala flygaktiviteter i syfte att föreslå en specifik rättslig ram för verksamheten för att bistå internationella och nationella lagstiftare. Kommitténs arbete presenterades 2024 i Aten som* ***resolution nr 05/2024*** **(*regler om icke-orbitala rymdflygaktiviteter*)**.

12. *Den tidigare rymdrättskommittén undersökte dock inte problemet med sanering av rymdskrot* (*dvs. aktiv borttagning av rymdskrot*). *Denna aktuella problemställning har börjat utvecklas på allvar först under de senaste åren, då tekniken för första gången gjort det möjligt att på allvar överväga idén om aktivt borttagande av skrot. Den tidigare*

former Space Law Committee therefore in part considered the baseline space law instruments such as the five United Nations Space Law Treaties, which are also relevant for the topic of space debris remediation, but did not regard them from a view relevant or helpful to activities of active debris removal. Therefore, the old Space Law Committee's past findings do not overlap with or contribute to the proposed mandate of the new Space Law Committee on Space Debris Remediation. Additional study is required and necessary to address a topic that will become of increasing significance in future, from an environmental, sustainable, governmental as well as commercial point of view.

rymdrättskommittén beaktade därför delvis de grundläggande rymdrättsinstrumenten, såsom de fem FN-fördragen om rymdrätt, som också är relevanta för frågan om sanering av rymdskrot, men betraktade dem inte som relevanta eller användbara för aktiviteter för aktivt borttagande av skrot. Därför överlappar inte den gamla rymdrättskommitténs tidigare slutsatser det föreslagna mandatet för den nya rymdrättskommittén för sanering av rymdskrot, och de bidrar inte heller till detta. Ytterligare studier är nödvändiga för att ta itu med ett ämne som kommer att bli allt viktigare i framtiden, både ur miljömässig, hållbarhetsmässig, statlig och kommersiell synvinkel.

Team

Arbetsgruppen

Chair: Prof. Dr Stephan Hobe, LL.M. (McGill) (German Branch)

Ordförande: Prof. Dr Stephan Hobe, LL.M. (McGill) (tyska avdelningen)

Prof. Dr Stephan Hobe is a Professor of Public International Law and European Law at the University of Cologne (Germany). He is Director of the Institute of Air Law, Space Law and Cyber Law at the University of Cologne and treasurer of the German Branch of the ILA. He has been both Rapporteur and later on Chair of the previous ILA Space Law Committee until end of its mandate in 2024 when it produced the Resolution on Non-orbital Spaceflight Activities. He is furthermore qualified to practice law in Germany and holds a Dr. jur. from the University of Kiel. He has authored books and manuals on space law, air law and international law as well as over 300 articles on various topics of international law, including numerous on different subjects of

Prof. Dr Stephan Hobe är professor i folkrätt och europeisk rätt vid universitetet i Köln (Tyskland). Han är direktör för Institutet för luftfartsrätt, rymdrätt och cyberrätt vid universitetet i Köln och kassör för den tyska avdelningen av ILA. Han har varit både rapportör och senare ordförande för den tidigare ILA-kommittén för rymdrätt fram till slutet av dess mandatperiod 2024, då den antog resolutionen om icke-orbitala rymdfartsaktiviteter. Han är dessutom behörig att utöva advokatyrket i Tyskland och har en doktorsexamen i juridik från universitetet i Kiel. Han har författat böcker och handböcker om rymdrätt, luftfartsrätt och internationell rätt samt över 300 artiklar om olika ämnen inom folkrätten, däribland ett stort antal om olika ämnen inom rymdrätten.

space law. Among other, he is author and editor of the famous Cologne Commentaries on Space Law. He teaches yearly as a visiting professor at universities in France, India, South Africa, Bulgaria, and regularly gives lectures to governmental and non- governmental actors world-wide. He is Honorary Director of the International Institute of Space Law and member of the European Space Law Centre Board. He often works with the European Space Agency, has managed numerous international projects and is presently managing a Collaboration Project between the Institute of Air Law, Space Law and Cyber Law and the German Aerospace Agency (DLR) to produce a Cologne Manual on the International Law of Space Traffic Management.

Han är bland annat författare och redaktör för den berömda Kölnkommentaren till rymdrätten. Han undervisar årligen som gästprofessor vid universitet i Frankrike, Indien, Sydafrika och Bulgarien och håller regelbundet föreläsningar för statliga och icke-statliga aktörer över hela världen. Han är hedersdirektör för International Institute of Space Law och medlem av European Space Law Centre Board. Han samarbetar ofta med Europeiska rymdorganisationen, har lett ett flertal internationella projekt och leder för närvarande ett samarbetsprojekt mellan Institute of Air Law, Space Law and Cyber Law och den tyska rymdorganisationen (DLR) för att ta fram en Köln-manual om rymdtrafikledningens folkrätt.

Co-Rapporteur: Dr Rada Popova (German Branch)

Dr Rada Popova is legal counsel at Isar Aerospace, a successful and ambitious German space start-up. She has acted as Co-Rapporteur of the previous ILA Space Law Committee in its last mandate on Non-orbital Spaceflight Activities. She previously worked as a Research Assistant at the Institute of Air Law, Space Law and Cyberlaw at the University of Cologne between 2014 and 2021, where she also taught international, European, space and constitutional. She holds a PhD in the field of space utilization in the context of international environmental law. Prior to that, she studied law at the University of Vienna and worked as a research assistant in the Foreign Policy Committee of the Bulgarian National Assembly. She also worked for a project funded by the Ministry of Education and

Medrapportör: Dr Rada Popova (tyska avdelningen)

Dr Rada Popova är juridisk rådgivare vid Isar Aerospace, ett framgångsrikt och ambitiöst tyskt rymdstartupföretag. Hon har varit medrapportör för den tidigare ILA-kommittén för rymdrätt under dess senaste mandatperiod om icke-orbitala rymdfartsaktiviteter. Mellan 2014 och 2021 arbetade hon som forskningsassistent vid Institutet för luftfartsrätt, rymdrätt och cyberrätt vid universitetet i Köln, där hon också undervisade i folkrätt, europeisk rätt, rymdrätt och konstitutionell rätt. Hon har en doktorsexamen inom området rymdutnyttjande i samband med internationell miljörätt. Innan dess studerade hon juridik vid universitetet i Wien och arbetade som forskningsassistent i utrikespolitiska utskottet i Bulgariens nationalförsamling. Hon arbetade också med ett projekt finansierat av ministeriet för utbild-

Research in Sofia from 2009 to 2013. She has published numerous works on international law, especially space and cyber law, and has worked on projects such as the translation of the Cologne Commentaries on Space Law, MILAMOS, Tallinn Manual 2.0 and ESA Convention Commentary. She is member of the International Institute of Space Law, Space Generation Advisory Council, an alumnus of the Hague Academy of International Law and holds an LBTechX1 Technology Entrepreneurship: Lab to Market Certificate from Harvard University.

ning och forskning i Sofia mellan 2009 och 2013. Hon har publicerat ett flertal verk om folkrätt, särskilt rymd- och cyberrätt, och har arbetat med projekt som översättningen av Kölnkommentaren till rymdrätten, MILAMOS, Tallinnmanualen 2.0 och kommentaren till ESA-konventionen. Hon är medlem i International Institute of Space Law, Space Generation Advisory Council, alumn från Haagakademin för internationell rätt och har ett LBTechX1 Technology Entrepreneurship: Lab to Market Certificate från Harvard University.

Co-Rapporteur: Prof. Dr Olavo Bittencourt-Neto

Prof. Dr Olavo Bittencourt -Neto is a professor of international law and space law at the Catholic University of Santos. He is member of the Board of Directors of the International Institute of Space Law and bears special responsibility as member of the important Directorate of Studies. As member of the editorial board of the book series “Air and Space Law” of Kluwer Publisher he participates in the selection of important new books in the area of air and space law.

Medrapportör: Prof. Dr Olavo Bittencourt-Neto

Prof. Dr Olavo Bittencourt-Neto är professor i folkrätt och rymdrätt vid Katolska universitetet i Santos. Han är medlem i styrelsen för International Institute of Space Law och har ett särskilt ansvar som medlem i den viktiga studienämnden. Som medlem i redaktionskommittén för bokserien »Air and Space Law» som utges på förlaget Kluwer Publisher deltar han i urvalet av viktiga nya böcker inom området luft- och rymdrätt.

Cologne, 23 January 2025

Köln 2025-01-23



Professor Dr Stephan Hobe

12 Bilaga 2: Kommittéordförandens enkät 2025-11-29

ILA Committee on Space Debris Remediation

A: Techniques and important facts about remediation

I:

1. **<u>What are the applied techniques for Space Debris Remediation?</u>**

Robotic Capture and Removal

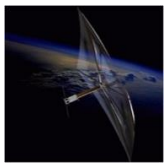


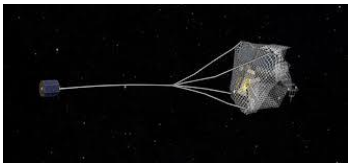
A spacecraft approaches debris, captures it, and either moves it to a disposal orbit or guides it into atmospheric re-entry by means of nets, harpoons, robotic arms, or tentacle-like manipulators. Appropriate for large debris (e.g., defunct satellites, rocket stages) in LEO. Capturing irregular or fast-spinning debris will present a challenge.

Requirements: It will require precision tracking and orbital prediction to rendezvous safely with target, debris characterization (shape, size, and rotation rate must be known in advance), advance spacecraft systems (appropriate propulsion, guidance, and robotic manipulators) and collision avoidance measures (critical during close proximity operations to avoid fragmentation).

Status: Feasible in the near-term. Technology is mature enough for demonstration missions (e.g., tested in ESA ClearSpace-1), meaning it is proven conceptually; relies on existing spacecraft tech.

Drag-Enhancement Devices



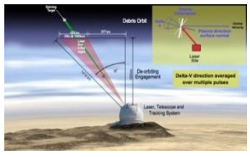


A satellite or debris object is fitted with a drag sail or tether that slows it down, causing it to naturally deorbit. It is a passive low-risk method, but slow and primarily intended for smaller (or medium) sized debris in LEO. Large-scale drag enhancement networks could passively deorbit swarms of micro-satellites or fragments, but deployment logistics would be complex (mid to long-term feasibility) and effectiveness will decrease with altitude and mass.

Requirements: It will require energy optimization, reliable power and communications (minimal for passive systems like sails; more for active tethers) and collision avoidance measures (safe rendezvous).

Status: Feasible in the near-term. Presently, RemoveDEBRIS mission successfully tested drag sails in orbit.

Laser Ablation or Photon Pressure

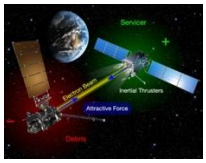


Ground-based or space-based lasers gently push or vaporize smaller debris, changing its orbit. A laser pulse heats the surface of debris, creating a small thrust that gradually alters its orbit. It is a remote, no contact method, but requires high energy laser (even higher energy requirements for larger debris) and faces regulatory issues (especially over using high-energy lasers in space). Primary advantages in its favour are contactlessness, scalability, that would enable it to target small debris not reachable by spacecraft However, if an object is overpowered this method poses risk of fragmenting objects.

Requirements: accurate tracking (critical for targeting small, fast-moving debris), debris characterization (surface material and size influence laser effectiveness) and collision avoidance measures to avoid unintended damage.

Status: feasible in the long-term, appropriate for small debris in all orbits. Presently the technology is experimental; some ground-based demonstration projects exist.

Electrostatic or Magnetic Tractor Methods

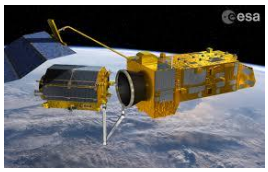


Charged spacecraft attract debris via electrostatic or magnetic forces, then adjusts its course or tows it to a safe orbit or re-entry point. Low-risk, but a slow process and only effective for certain types of debris (conductive).

Requirements: precision tracking, debris characterization (surface charge, mass, and material properties matter) and autonomous navigation.

Status: feasible in the long-term for smaller debris, presently experimental - proposed in research; no operational missions yet.

Active De-orbit Modules



Small modules (“kick modules”) attach to existing debris (e.g., old satellites or rocket stages) provide propulsion to deorbit it. Its primary target is large trackable debris (e.g., old satellites or rocket bodies) with known structure primarily in LEO. It is not feasible for tiny fragments or irregular shapes.

Requirement: It is direct, controllable, but requires attachment therefore careful planning will be necessary to manage collision risk for safe attachment. Attachment method will depend on mass and geometry.

Status: feasible in the near-term as it can leverage existing propulsion technology. Nonetheless, presently this method is conceptual, with small-scale experiments planned.

2. Who is active in the field?

Several companies are active on the market, primarily in North America, Europe and the Asia Pacific. Out of these four seem to lead the field with actual demonstration missions underway.

Astroscale Holdings Inc. based in Tokyo, Japan and present globally is perhaps the most established "pure-debris-removal / in-orbit servicing" specialist. Offers Life Extension, end-of-life (EOL) services and active debris removal (ADR) solutions. Successfully completed "ADRAS-J" mission (launched in February 2024), tasked with rendezvous and inspect a defunct rocket upper stage (from a 2009 H-2A vehicle). It has contracts/funding from Japanese government and space agencies (incl. JAXA), and reportedly expanding partnerships internationally (e.g. with Indian firms for Asia-Pacific footprint expansion).

ClearSpace SA based in Lausanne, Switzerland is leading Europe's first effort toward commercial debris removal. In 2020, signed a ~€86 million service contract with European Space Agency (ESA) to remove a piece of space debris — the upper stage "Vespa" adapter from a 2013 Vega launch. Its mission, ClearSpace-1, aims to rendezvous, capture with robotic arms and deorbit the debris (together with the servicer) — marking the first active removal of uncooperative debris from orbit. Launch currently planned for mid-2020s (the mission originally scheduled for 2025; later planning updated toward 2026/2029 depending on source).

Northrop Grumman Corporation (via its in-orbit servicing subsidiary) based in the USA, is (historically) a large defense/aerospace contractor. It is now increasingly applying its capabilities to in-orbit servicing — including debris mitigation and active removal. Their "Mission Extension Vehicle" (MEV) program offers satellite life-extension (by docking and providing station-keeping, avoiding the need to decommission or create more debris). Their roadmap suggests future servicing spacecraft (with robotic arms) could enable inspection, relocation, repair — and also active debris removal.

Airbus Defence and Space / Airbus SAS based in the Europe (Netherlands, France, Germany etc.) is listed among the top companies identified in market-research reports as a "major player" in the space-debris removal and space-situational-awareness (SSA) market. They develop debris-mitigation technologies (satellite tracking / SSA, possibly capture systems).

3. **Are these companies selfsustained or are they government sponsored?**

Currently, demand is largely driven by governments or large agencies rather than commercial customers. That means many of the earliest contracts are "public-sector funded," which can be slow and bureaucratic. For many satellite operators, paying for debris removal (especially for debris they didn't create) still feels optional. Unlike, say, insurance, the business model isn't yet standard — making cost-benefit calculations fuzzy. Experts and reports repeatedly point out this "lack of direct revenue" model. Even "service-ready" firms face real-world constraints: limited number of missions, nascent demand, high costs, legal & regulatory uncertainties. So "operational readiness" doesn't automatically mean "scalable service." Many ADR initiatives are still essentially pilot missions, not large-scale cleaning operations - capturing non-cooperating debris remains a high challenge.

4. **What would the removal of the various sizes of space debris cost?**

Total Estimated Cost (2025–2035): 127.000.000.000 USD

Breakdown:

1) Tracking and Monitoring Infrastructure **(**Ensures collision avoidance and guides removal missions) will require enhanced ground- and space-based tracking: ~$1–2B USD over 10 years
2) Large Debris

- Target: 1,500 large objects in LEO
- Assume 50% addressed by single missions removing multiple targets (~3 per mission) → ~250 missions
- Cost per mission: $300M
  Total Cost (Large Debris): 250 missions × $300M = 75{,}000M$ USD $= 75BUSD$

3) Medium Debris

- Target: 200,000 trackable medium debris objects
- Assume 50% of satellites/upper stages carry drag-enhancement devices (~100,000 objects)
- Cost per device: ~$1M
  Total Cost (Medium Debris): $100{,}000 \times 1M = 100{,}000M$ USD $= 100BUSD$
  Note: Many medium fragments will naturally decay if in low-altitude LEO or are mitigated by future satellite design standards, reducing actual cost. Realistic estimate could be ~$20–50B USD with prioritization.

B. Possible Legal Problems.

1. Wirth regard to the legal problems under consideration one could think of
   a) Drafting a set of guidelines?
   b) A UNGA resolution?
   c) A model law?
2. Is a piece of space debris a space object in the sense of the definition of thin space law?
3. Should a third party be allowed to remove foreign space debris?
4. How could one give incentives space debris remediation?
5. Will t be recommendable to start with a provision of definitions?
6. Should the rules on space debris remediation give an incentive for the commercialisation of this activity?

C. Nota bene: Next online meeting will be on Saturday 11 April at 12 o'clock CET. Chair will release the online codes.

Best
Stephan Hobe

13 Bilaga 3: Svar 2026-04-04 av Dirk Roland Haupt på enkäten

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Memorandum for the April 11, 2026 Meeting of the International Law Association (ILA) Committee on Space Debris Remediation

Preliminary Responses to the Chair's Six Questions on Possible Legal Problems

Lund, Sweden, April 4, 2026

1 This memorandum endeavors to answer the Chair's six questions from a single premise: space debris remediation requires clarification at the level of space law as part of public international law, but its operational center of gravity will lie in the emerging commercial law of space activities—licensing, contract, finance, insurance, procurement, confidentiality, and supervision of private operators. The Committee's task, therefore, is not merely to restate the 1967 Outer Space Treaty system, but to translate it into a legal architecture that permits a disciplined commercial market for remediation services to emerge without impairing sovereign, national security, ownership, or intellectual property interests.

2 The preliminary conclusions I wish to offer below build on concerns already raised in the Committee's circulated materials,[1] especially the emphasis on definitions, legal certainty, and commercial feasibility, but they go one step further in favoring instruments that can be operationalized at the national level and used by regulators and market actors in real missions.

[1] *See* ❶ Information on the technique and the financial details of space debris remediation circulated by Stephan Hobe, containing a questionnaire for the ILA Committee on Space Debris Remediation of possible legal problems (December 21, 2025) (on file with author); ❷ Gábor Sulyok: *Comments on the Committee's Questionnaire (March 9, 2026)* (on file with author); ❸ Theuns Kotzé: *Input to the ILA Committee on Space Debris Remediation (March 24, 2026)* (on file with author); annotated discussion materials circulated by ❹ Kai-Uwe Schrogl (March 16, 2026) and ❺ Ulf Häußler (March 22, 2026) (on file with author).

1. With regard to the legal problems under consideration, one could think of
(a) Drafting a set of guidelines?
(b) A United Nations General Assembly resolution?
(c) A model law?

3 Among the three options identified by the Chair, the closest and most useful fit is **a model-law-oriented architecture**. The Committee should present that architecture through an International Law Association resolution stating general principles and an accompanying implementation manual containing adaptable legislative modules. That choice is functionally closest to a model-law solution, but it also conforms to the Committee's mandate and avoids promising universal uniformity where present political conditions do not support it. The reason is practical. Active space debris remediation will actually be governed where missions are licensed, supervised, insured, financed, and procured. That regulatory center of gravity sits at the national level under Article VI of the 1967 Outer Space Treaty, not at the level of general exhortation.[2]

4 The most instructive analogies are functional rather than institutional. The 1958 New York Convention and the 2001 Cape Town Convention system are helpful analogies because each, in its own way, reduced transaction risk across borders: the former by making arbitral awards more readily recognizable and enforceable, and the latter by standardizing priority, registry, and enforcement rules for high-value mobile assets.[3] Investors do not respond to aspiration alone; they respond to legal structures they can price. The analogies should likewise be framed only as cautionary. In deep-seabed mining and in some implementations of the 2010 Nagoya Protocol,[4] layered permissions and regulatory incompleteness have

[2] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, opened for signature January 27, 1967, 610 U.N.T.S. 205 [1967 Outer Space Treaty].

[3] ❶ Convention on the Recognition and Enforcement of Foreign Arbitral Awards, opened for signature June 10, 1958, 330 U.N.T.S. 3 [1958 New York Convention]; ❷ Convention on International Interests in Mobile Equipment, done at Cape Town November 16, 2001, 2307 U.N.T.S. 285 [2001 Cape Town Convention]; ❸ Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Aircraft Equipment, done at Cape Town November 16, 2001, 2367 U.N.T.S. 517 [2001 Cape Town Aircraft Protocol].

[4] Those contrary examples are equally instructive:

– In the framework of Part XI of the ❶ United Nations Convention on the Law of the Sea, concluded at Montego Bay, December 10, 1982, 1833 U.N.T.S. 3, as implemented by the ❷ Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, adopted at New York, July 28, 1994, 1836 U.N.T.S. 3, regulatory →

been associated with delay, higher compliance costs, and investment hesitation. Space debris remediation should avoid importing that pattern.[5]

5 For that reason, the Committee should draft in layers. The resolution should contain the higher-level principles. The manual should contain optional legislative modules on licensing, consent, insurance, financial responsibility, confidential information handling, emergency authority, and remedies for non-compliance. Technical methods should be left to evolving standards and mission practice rather than frozen in black-letter text. If political conditions later improve, that architecture could feed into guidelines adopted elsewhere or into a future General Assembly product. At the present stage, however, the Committee should draft for implementation, not merely for endorsement.

6 ***Preliminary Conclusion.*** *The Committee should use an International Law Association resolution plus manual, with model-law modules as the operative core. That is the vehicle most likely to translate treaty duties into workable law and commercially operable practice.*

delay in deep-seabed mining has deterred or deferred investment because exploitation remains dependent on an incomplete rulebook. *See* ❸ Joanna Dingwall: "International Investment Protection in Deep Seabed Mining Beyond National Jurisdiction", 19:5–6 *The Journal of World Investment and Trade* 890–929 (2018); ❹ Alberto Pecoraro: "Law of the Sea and Investment Protection in Deep Seabed Mining", 20:2 Melbourne Journal of International Law 529–570 (2019); ❺ Klaas Willaert: "Under Pressure: The Impact of Invoking the Two Year Rule within the Context of Deep Sea Mining in the Area", 36:3 *The International Journal of Marine and Coastal Law* 505–513 (2021).

– The practice of implementation of the ❻ Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, done at Nagoya October 29, 2010, 3008 U.N.T.S. 3, has shown how layered permissions and inconsistent terminology can burden legitimate activity if procedures are not streamlined. *See* ❼ Nicolas Pauchard: "Access and Benefit Sharing under the Convention on Biological Diversity and Its Protocol: What Can Some Numbers Tell Us about the Effectiveness of the Regulatory Regime?", 6:1 *Resources* 11–26 (2017).

[5] *Compare* ❶ Gábor Sulyok @note 1 ❷ (favoring guidelines, preferably through the United Nations Committee on the Peaceful Uses of Outer Space, while expressing concern about model-law fragmentation) with ❷ Theuns Kotzé @note 1 ❸ (favoring a softer-law route and suggesting International Organization for Standardization-linked standardization).

2. Is a piece of space debris a space object in the sense of space law?

7 Yes. Under existing space law, a piece of debris should be treated as a space object, or at minimum as a component part of one, for purposes of the treaty system. The decisive point is legal continuity. The 1972 Liability Convention and the 1975 Registration Convention make clear that the relevant treaty category includes component parts of a space object, as well as its launch vehicle and parts thereof; and Article VIII of the 1967 Outer Space Treaty confirms that ownership is not lost by reason of an object's presence in outer space or its return to Earth.[6] Those legal links should not disappear at the precise moment when an object becomes hazardous. A rule that treated non-functionality as legal extinction would produce the wrong incentive structure: the more dangerous the object, the less clearly regulated it would become.[7]

8 The better approach is therefore not to invent a new ontological category, but to treat "space debris" as a regulatory subcategory within the broader category of "space object." That preserves continuity while allowing the Committee to create narrower operational distinctions, such as identified debris, debris of indeterminate registry, priority debris, and debris that is technically remediable. The important move is to differentiate for regulatory purposes without severing the legal attachment that existing law already provides.

9 One further point follows. If the Committee wishes to recognize *de lege ferenda* a narrower class of genuinely abandoned or orphaned debris, that should be done through a specific legal mechanism with procedural safeguards—notice, a waiting period, and an administrative determination—not through the claim that debris is no longer a space object at all. Abandonment should be a legal status, not a physical condition inferred from silence, malfunction, or age. This also avoids creating an artificial legal vacuum in which the most dangerous objects would become the least clearly regulated.

10 ***Preliminary Conclusion.*** *Space debris should remain a space object or component part thereof under existing space law. Any narrower categories should operate only as remedial subcategories, not as a substitute for the treaty baseline.*

[6] ❶ Convention on International Liability for Damage Caused by Space Objects, opened for signature March 29, 1972, 961 U.N.T.S. 187 [1972 Liability Convention]; ❷ Convention on Registration of Objects Launched into Outer Space, opened for signature January 14, 1975, 1023 U.N.T.S. 15 [1975 Registration Convention].

[7] *Compare* ❶ Gábor Sulyok @note 1 ❷ with ❷ Theuns Kotzé @note 1 ❸, both concluding that space debris should remain within the legal category of "space object."

3. Should a third party be allowed to remove foreign space debris?

11 Yes, but only within a licensing architecture that rejects free-salvage analogies. As a *de lege lata* starting point, removal of identified foreign debris ordinarily requires the consent of the State of registry, together with due regard for any continuing ownership and security interests. The Committee's *de lege ferenda* task is therefore not to assume away consent, but to design mechanisms by which consent can be standardized, given in advance, or—where States have expressly opted in—presumed under tightly specified conditions.

12 I would recommend a tiered authorization structure:

- First, there should be a **contractual lane**: removal of identified foreign debris pursuant to express mission-specific consent, preferably documented through standardized clauses addressing access, liability allocation, data protection, and verification, or better yet standing consent recorded in advance through a registry or framework arrangement for identified classes of objects.
- Second, there should be an **administrative lane** for hard cases, but only where the State of registry has accepted in advance—by treaty, framework arrangement, or standing declaration—that specified categories of non-responsive, abandoned, or high-risk debris may be handled through a deemed-consent procedure. Within such an opt-in framework, the law could allow tightly cabined deemed consent after diligent identification efforts, formal notice through designated channels, a defined waiting period, and a reasoned administrative determination by the competent authority.
- Third, there should be an **emergency stabilization lane** allowing only those temporary, least-intrusive measures that are strictly necessary to avert grave and imminent harm. Irreversible removal or disposal should still require prior authority unless an applicable international arrangement expressly provides otherwise.

13 Two safeguards are indispensable:

- First, only operators licensed under a heightened authorization category should have access to these pathways, with *ex ante* screening for cybersecurity, export-control compliance, insurance, and chain-of-custody or equivalent handling procedures.
- Second, remediation authority should not imply salvage title. Unless expressly agreed otherwise, the operator is paid for a service; remediation must not imply transfer of title, access to protected payload data, or a right to exploit proprietary technology.

14 ***Preliminary Conclusion.*** *A third party should be allowed to remove foreign space debris, but only through a licensed, consent-centered, and security-screened system that also includes narrowly framed deemed-consent and emergency procedures.*

4. How could one give incentives for space debris remediation?

15 Space debris remediation will not scale unless the law creates a market that investors and lenders can evaluate on ordinary commercial terms. A central obstacle is the absence of bankable revenue streams. The law should therefore aim less at punishment in the abstract and more at market formation. In practical terms, that means combining demand-side procurement, *ex ante* financial design, and proportionate enforcement.

16 On the demand side, governments and intergovernmental organizations should act as anchor customers. They can do so through advance purchase commitments, fixed-price milestone contracts, framework service agreements, and prize mechanisms for verified removal of priority targets. On the *ex ante* side,[8]

- licensing rules should use refundable orbital-use deposits or performance bonds, with better terms for operators who design spacecraft to be removable: standardized grapple or interface points, retained telemetry, and contractual data escrow sufficient for safe end-of-life intervention;
- the framework could also use a remediation-credit mechanism, but credits should issue only for independently verified remediation that goes beyond an operator's baseline legal duties; otherwise the law would reward the correction of self-created non-compliance.[9]

[8] The European Space Agency's Zero Debris approach—as analogy to mitigation and regulatory design rather than as precedents for third-party active debris removal—points in the same direction: removability should be treated as an *ex ante* design requirement, not merely as an *ex post* clean-up expense. ❶ European Space Agency—European Space Operations Center: *Zero Debris Charter: Towards a Safe and Sustainable Space Environment* (November 7, 2023); ❷ European Space Agency: *ESA Space Debris Mitigation Requirements ESSB-ST-U-007, Issue 1* (October 30, 2023); ❸ European Space Agency: *Zero Debris Technical Booklet Issue 1.0* (December 6, 2024).

[9] Related operational materials already in circulation, and useful mainly as regulatory-design references rather than as legal authorities, include similarly: ❶ Federal Communications Commission: *In the Matter of DISH Operating L.L.C., Consent Decree, DA 23-888* (October 2, 2023); ❷ RPO Operators Consortium composed of Astroscale, ClearSpace and D-Orbit, for the Department for Science, Innovation and Technology (DSIT), with the participation of the Civil Aviation Authority (CAA) and the United Kingdom Space Agency: →

Differential licensing can also help: operators with strong compliance records may merit expedited review or reduced financial-security burdens where risk truly permits.[10]

17 The regulatory process matters as much as the money. A commercially serious regime should prefer commercial solutions where they are safe, use time-bounded licensing decisions, allow sandboxed pilot missions for novel rendezvous and proximity operations, and eliminate duplicative review layers. Administrative sanctions remain necessary for persistent non-compliance, but they should discipline the market rather than substitute for one. Where other international sectors have required investors to wait through overlapping permissions or incomplete downstream rules, private capital has either withdrawn or priced the uncertainty heavily. Space debris remediation should not repeat that mistake.

18 ***Preliminary Conclusion.*** *Incentives should be built around market formation: anchor demand, verified performance payments, refundable security instruments, and design-for-remediation advantages, all within a streamlined but supervised regulatory process. Thus, the law should create incentives by combining enforceable duties with predictable revenue pathways, verified credits, and proportionate financial assurance. The goal is to make debris removal a financeable service, not a charitable add-on.*

5. Will it be recommendable to start with a provision of definitions?

19 Yes, but the definitions article should be short and should do only work that truly belongs in legislation. In an emerging technical field, the greatest drafting danger is over-definition. Once an operative text begins to define engineering methods, collision-probability thresholds, or target-selection metrics in detail, it becomes obsolete before it becomes influential. The Committee should therefore start with definitions, but with what might be called a minimal legal grammar.

20 The core terms are those that trigger legal consequences: “space object,” “space debris,” “space debris remediation,” “active debris removal,” “operator,” “state of registry,” “launching state,” “identified debris,” “debris of indeterminate registry,” “authorization,” “emer-

Regulatory Sandbox for Rendezvous and Proximity Operations – Stage 1. Independent Public Report (August 2025).

[10] *Compare* ❶ Gábor Sulyok @note 1 ❷ (drawing attention to the ❷ DISH enforcement action) with ❸ Theuns Kotzé @note 1 ❸ (emphasizing public-private participation and commercial incentives).

gency intervention," and "verified removal." Each of those terms either allocates responsibility, opens a licensing pathway, or affects consent and liability. By contrast, specific capture techniques, trackability thresholds, or engineering success criteria should not sit in the operative text. Those matters belong in annexes, manuals, technical standards, or incorporated reference documents that can evolve without reopening the legal instrument itself.

21 I would also preserve a deliberate distinction between definitions and evidentiary criteria. A definition tells the reader what a term means in law. An evidentiary rule tells the regulator what must be shown to invoke that term in practice. Collapsing those two functions into a single provision produces unnecessary disputes. The same restraint should govern sovereignty, national security, and intellectual property concerns: the definitions article should specify what information the law requires, while separate confidentiality and access-control provisions should govern how sensitive material is submitted, reviewed, and protected.

22 ***Preliminary Conclusion.*** *It is advisable to begin with a definitions provision, but it should be disciplined, consequences-based, and kept separate from technical descriptions and rules of evidence.*

6. Should the rules on space debris remediation give an incentive for the commercialization of this activity?

23 Yes, but with a crucial clarification: the law should encourage commercialization of the remediation service, not commercialization of foreign debris as such. The market that needs to be unlocked is a market for licensed performance—inspection, capture, towing, deorbiting, reorbiting, and verified risk reduction. It should not become a law of unilateral salvage. That distinction matters for both political acceptability and commercial clarity.

24 A supervised commercial market is the most plausible route to scale. States and intergovernmental organizations will remain indispensable as regulators, security reviewers, and early customers, and some missions involving sensitive governmental assets may have to remain State-led. But repeated, industrialized remediation missions will require private capital, iterative engineering, supply chains, insurance, standardized contracts, and a workforce able to move from demonstration to routine service. Comparative experience in cross-border arbitration and asset-based aircraft finance points in the same direction:

markets mature when the law reduces transaction risk and makes performance rights legible across jurisdictions.

25 That said, commercialization must remain bounded by public law. The framework should provide predictable licensing, time-disciplined approvals, bankable service contracts, confidential submission channels for proprietary technical material, and clear liability and insurance rules. At the same time, it must preserve national security review for dual-use capabilities, export-control compliance, cybersecurity obligations, and strict protection for trade secrets and sensitive payload data. Regulators should demand functional transparency, not forced disclosure of source code, capture algorithms, or other proprietary know-how unless genuinely necessary and then only through protected channels.

26 ***Preliminary Conclusion.*** *The rules should affirmatively encourage commercialization, because without commercialization remediation will not scale. But the object of commercialization must be the regulated service, not the target object, and the market must remain bounded by licensing, security review, and protection of intellectual property interests.*

14 Bilaga 4: Kommittéordförandens och rapportörernas promemoria »Consolidated Findings Report: A Synthesis of the Work of Working Groups 1, 2, 3 and 4»

INTERNATIONAL LAW ASSOCIATION

Committee on Space Debris Remediation

Consolidated Findings Report

A Synthesis of the Work of Working Groups 1, 2, 3 and 4

Prepared for consideration ahead of the ILA Biennial Conference, Vienna, 18 August 2026

Chair: Stephan Hobe | Rapporteurs: Rada Popova and Olavo Bittencourt Neto

26 July 2026

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Executive Summary

This report consolidates the findings to date of the four Working Groups established by the International Law Association (ILA) Committee on Space Debris Remediation (SDR): Working Group 1 (choice of normative instrument), Working Group 2 (third-party removal of space debris), Working Group 3 (definitions and terminology), and Working Group 4 (economic and non-economic incentives). It is intended as a single reference document synthesising the Committee's progress for presentation and discussion within the ILA, with a view to eventual submission to UNCOPUOS and presentation at UNISPACE IV in 2027.

Four consistent themes emerge across the Working Groups' work:

- A preference for a layered, soft-law approach rather than an immediate binding treaty, given the current geopolitical environment (WG1), which nonetheless leaves room for a future UN-level instrument.
- Consent — and the design of mechanisms to standardise, pre-record, or narrowly substitute for it — as the central legal problem in enabling third-party space debris remediation (WG2), grounded in Article VIII of the Outer Space Treaty and the exclusive jurisdiction and control of the State of registry.
- The need for precise, consequence-driven legal definitions (WG3) to underpin any future instrument, distinguishing legally operative terms from technical, evidentiary, and commercial vocabulary.
- The potential of economic and non-economic incentives — bonds, market-based credits, an international fund, standardisation, ratings and certification, and OST-grounded narratives — to complement the Committee's legal recommendations by making remediation commercially viable and socially expected (WG4), alongside an open question as to whether such policy-oriented material belongs in the Committee's final legal outcome document.

The report also incorporates written comments received from Committee members George Kyriakopoulos (Greek Branch) and Mahulena Hofmann (German/Czech Branch) on the Working Group 2 draft text, which raise important qualifications regarding the legal basis for third-party removal and recent developments at the International Telecommunication Union (ITU).

1. Background and Mandate

The ILA Committee on Space Debris Remediation was established following a proposal by Stephan Hobe (German Branch) in April 2024. The Committee's mandate runs over four years and is outcome-oriented:

- Year 1: collection of existing legal instruments, technological materials, governmental practice, industry developments and political positions;
- Year 2: a report of first findings;
- Year 3: development of possible solutions;
- Year 4: presentation of a resolution and an implementation-oriented manual.

Four Working Groups were tasked with distinct but interlocking questions: what type of instrument the Committee should propose (WG1); whether and under what conditions a third party should be permitted to remove another actor's space debris (WG2); which terms require legal definition to support the Committee's broader work (WG3); and how economic and non-economic incentives for remediation, including commercialisation, might be created (WG4). Their findings to date are set out below.

2. Working Group 1: Choice of Normative Instrument

Building on the seven COPUOS Space Debris Mitigation Guidelines, Working Group 1 examined the available options for the most appropriate normative instrument for space debris remediation.

2.1 Conclusion: a layered soft-law approach

While a universal binding treaty or a non-binding UNGA Resolution would in principle be the optimal solution, the Working Group concluded that neither is achievable in the prevailing geopolitical environment. It therefore recommends, in the first instance, a soft(er)-law approach consisting of practical guidelines, recommendations and standards capable of being implemented voluntarily by national governments and space agencies at their own convenience.

The Working Group proposes a layered ILA resolution designed to maximise potential benefit for States, comprising:

- Higher-level general principles, derived from and duly reflecting existing international law (lex lata);
- A complementing set of high-level guidelines for use in international deliberations and as a source of national legislation — covering, among other things, licensing, consent, insurance, financial responsibility, confidential information handling, emergency authority, remedies for non-compliance, and unilateral commitments on dispute resolution;
- A draft set of principles that could later be considered within the United Nations at an appropriate level and time.

2.2 Implementation pathway

States are to be encouraged to collaborate through national or multinational space agencies to refine the guidelines. Should the resolution find favour, the Committee envisages a subsequent formal set of guidelines that would (a) sketch a blueprint for national policy or legislation based on feedback received; (b) be submitted to UNCOPUOS for consideration; and (c) be presented at UNISPACE IV in 2027.

Technical methods for space debris remediation are deliberately left to evolving standards and mission practice; the Committee will liaise as necessary with the International Organization for Standardization (ISO)

and the Inter-Agency Space Debris Coordination Committee (IADC) to keep abreast of relevant technical developments.

3. Working Group 2: Third-Party Removal of Space Debris

Working Group 2 addresses the Committee's Question 3: “Should a third party be permitted to remove others' space debris?” The Working Group's draft text, prepared by Irmgard Marboe with contributions from Mahulena Hofmann, Marco Pedrazzi, Olavo de Bittencourt, Alla Pozdnakova, George Kyriakopoulos and Duncan Blake, sets out both the responses of Committee members to an internal questionnaire and a detailed legal analysis.

3.1 Committee members' preliminary positions

Replies to the questionnaire (Question 3) showed broad, though not unanimous, support for permitting third-party removal only under clearly defined conditions, generally anchored in the consent of the operator or State of registry:

- Tanja Masson-Zwaan (Dutch Branch): removal only with explicit permission and a contract clearly allocating liability.
- Marie-Clotilde Runavot (French Branch): jurisdiction and identification of the State of registry remain central difficulties, particularly for smaller debris; a possible safety exception to the consent requirement merits consideration.
- Gabor Sulyok (Hungarian Branch): removal should be permitted under strictly defined conditions, given the practical imbalance between the (large) number of debris-generating actors and the (few) actors capable of remediation; conditions must be formulated with extreme caution and subject to strict, continuous supervision.
- Theunis Kotze (South African Branch): commercial incentives, necessarily involving third parties, are essential to effective SDR.
- Mahulena Hofmann (German/Czech Branch): consent-based removal, or — absent consent — removal only in emergency, by analogy to the law of the sea (necessity and protection of human life).
- Dirk Haupt (Swedish Branch): a tiered authorisation architecture rejecting free-salvage analogies (see 3.3 below), whose preliminary conclusion is that third-party removal should be permitted only through a licensed, consent-centred and security-screened system with narrowly framed deemed-consent and emergency procedures.

3.2 Legal foundations: jurisdiction, control, ownership and registration

The Working Group's analysis centres on Article VIII of the Outer Space Treaty, under which the State of registry “shall retain jurisdiction and control” over a registered space object. Key findings include:

- ‘Jurisdiction’ and ‘control’ must be read together — jurisdiction should induce control, and control should be based on jurisdiction — and are best understood as a form of ‘quasi-personal’ (rather than quasi-territorial) jurisdiction, analogous to that exercised over ships or aircraft.
- Jurisdiction and control are distinct from ownership: registration does not affect, and is independent from, ownership rights, which are governed by general international law or national law rather than by Article VIII itself.
- The right to jurisdiction and control is exclusive to the State of registry and is generally regarded as permanent; it is not clear that a State can unilaterally derelict a space object, since doing so would not extinguish its liability as a launching State under Article VII.

- Interference with this exclusive right by another State — including a mission to remove the object from orbit without consent — would, absent a recognised exception, constitute an internationally wrongful act.
- Consent between the State of registry and the removing State can change this assessment, either as an exercise of the right of jurisdiction and control itself or as 'consent' precluding wrongfulness under Article 20 of the ILC Articles on State Responsibility.
- Registration is a national, not necessarily international, act: a failure to notify the UN registry does not defeat jurisdiction and control so long as national registration exists. Conversely, where no State has registered an object nationally, no State holds jurisdiction and control over it, and its removal by a third party is, in principle, prima facie lawful under international space law — though property or diplomatic-protection issues may still arise if the object is State- or privately-owned.

The Working Group therefore identifies identification of the State of registry as the critical first practical step in any remediation mission, and recommends the development of dedicated procedures and institutions to support it.

3.3 Mechanisms for achieving consent

Drawing substantially on a proposal by Dirk Haupt, the Working Group outlines a tiered structure for obtaining or substituting for consent:

- Contractual lane: mission-specific agreements (or standing/advance consent recorded in a registry or framework arrangement) addressing access, liability allocation, insurance, data protection, verification, debris-mitigation and passivation standards, and dispute resolution.
- Administrative (deemed-consent) lane: available only where a State of registry has opted in by treaty, framework agreement or standing declaration for defined categories of non-responsive, abandoned or high-risk objects; consent is treated as granted after diligent identification, formal notice through designated channels, a defined waiting period, and a reasoned administrative determination.
- Emergency stabilisation lane: narrowly available for temporary, least-intrusive measures strictly necessary to avert grave and imminent harm; irreversible removal still requires prior authority unless an applicable international arrangement provides otherwise.

Two safeguards are proposed as indispensable: access to these pathways should be limited to operators licensed under a heightened authorisation category (with ex ante screening for cybersecurity, export control, insurance and chain-of-custody); and remediation authority should not imply salvage title — absent express agreement, the operator is understood to be paid for a service, not granted ownership, data access, or rights to exploit proprietary technology.

3.4 Possible exceptions to the need for consent

The Working Group examines four possible bases on which removal without consent might nonetheless be lawful:

(a) Salvage

An analogy to maritime salvage law (based on the common-law notion of a 'derelict' — abandoned sine spe recuperandi and sine animo revertendi) has been explored, under which a permanently inactive satellite might be treated as derelict and opened to third-party retrieval with a service-based claim against the owner, without stripping title. However, the Working Group notes that commentators regard salvage-based inferences of abandonment as contradicting the clear text of Article VIII absent an explicit treaty qualification: disuse or loss of control does not equal abandonment, and the Outer Space Treaty's strict liability regime under Article VII should not be circumvented by presumed abandonment. The protected interests also differ — maritime

salvage law protects the shipowner's property and rewards rescuers, whereas the core concern in orbit is safeguarding other States' freedom of use under Article I. Article 5(4)–(5) of the Rescue Agreement offers only limited support, since it addresses hazardous objects recovered on Earth, not objects left in orbit. The Working Group suggests that an international expert body, modelled on IMO practice, could instead develop technical standards and recommended practices defining derelict status and structuring awards, without requiring treaty amendment.

(b) Distress

Article 24 of the ILC Articles on State Responsibility may justify emergency removal of a non-functioning object where it presents an imminent, concrete threat to human life (e.g., a high-probability conjunction with a crewed spacecraft or an uncontrolled reentry threatening populated areas), subject to four conditions: imminent peril to life; no reasonable alternative; no contribution to the peril by the acting State; and proportionality and temporariness of the measure taken.

(c) Necessity

Article 25 of the ILC Articles may justify removal without consent where it is the only way to safeguard an essential interest of the acting State against grave and imminent peril, and does not seriously impair an essential interest of other States or the international community as a whole. Essential interests may include protection of human life, critical national infrastructure, or the acting State's population from uncontrolled reentry. The plea is unavailable where the acting State contributed to the peril, and remains exceptional and fact-specific.

(d) Countermeasure

The Working Group explores whether removal could be framed as a lawful countermeasure under Article 49 of the ILC Articles, on the theory that retaining a non-functional object in orbit without use may itself breach the ‘due regard’ obligation of Article IX and, in some readings, amount to a form of prohibited appropriation contrary to Articles I and II of the Outer Space Treaty. Reinforcing this logic, ITU practice conditions international frequency protection on actual, continued operation at the notified orbital position; rigorous enforcement (including cancellation of the Master International Frequency Register entry for inactive assignments) would not itself authorise removal, but could support a duty to deorbit or re-orbit. Any countermeasure analysis requires case-by-case assessment of the identity of the injured State, prior unsuccessful negotiation, proportionality, and the exclusion of the use of force.

Commentators propose a hierarchy of priorities for assessing these exceptions in practice: (a) prevention of life-threatening dangers; (b) maintenance of international peace and security (potentially including environmental degradation); and (c) advancement of strategic or economic interests — the last being the most controversial, though the Working Group considers this need not be a major obstacle where the removing party bears the costs.

3.5 Proposed procedures and institutions

The Working Group proposes a step-by-step procedural approach: (1) identification of the object; (2) consultation of the UN registry; (3) if unregistered, requests to States with space situational awareness (SSA) tracking facilities; (4) if still unresolved, public announcement of intent, method, and orbital parameters; and (5) a waiting period (tentatively 30 days) for any State of registry to come forward, after which the removing party may either negotiate consent or proceed with its plan.

A future institutional design would combine object identification and registry checks, mission-specific contracts and standing consent registries, an opt-in administrative deemed-consent mechanism (with notice, waiting period, reasoned decision, publication and post-operation auditing), and a narrowly available emergency stabilisation channel — supported by licensing and security screening of qualified operators.

3.6 Committee member comments on the WG2 draft

Two sets of written comments on the WG2 draft text were received and are reflected in this synthesis.

George Kyriakopoulos (Greek Branch, 11 July 2026)

Kyriakopoulos endorses the draft's overall structure but raises several qualifications:

- The only presently certain legal bases for third-party active removal are (i) the consent of the registering State, and (ii) the ILC circumstances precluding wrongfulness (consent, self-defence, countermeasures, force majeure, distress, necessity). He would not add "protection of the environment" as a free-standing basis, since this would imply recognising a form of actio popularis — a State's right to act 'in the interest of the community' — that is not presently accepted in general international law, except arguably for breaches of erga omnes obligations (citing the ICJ's Gambia v. Myanmar decision), a category into which unilateral, ad hoc debris removal does not yet fall. He stresses, however, that these bases are nothing new: they were already available under general international law, so the core problem — third-State removal of debris — remains entirely unresolved.
- Because the State of registry alone exercises jurisdiction and control, no right of unilateral, ad hoc removal by a third State currently exists outside the recognised exceptions; establishing such a right would, in his view, be very difficult to accept within the international space community.
- Even for unregistered objects, removal cannot automatically be presumed lawful, since the underlying question is the existence of a right to remove, not merely the absence of an identified registering State; in his view an "invisible" State demanding that removal cease will emerge in the majority of cases, not merely as a remote possibility.
- His central recommendation is therefore to prioritise, within the Working Group, the creation of an international SDR mechanism — a multilateral treaty or international organisation — which could achieve the desired effectiveness at least among its States parties, rather than relying on ad hoc unilateral action. He agrees with the draft's rejection of the salvage analogy, and considers that the environment cannot generally serve as a legal basis for ad hoc removal because protecting it requires a broader, systemic response rather than isolated interventions. He explicitly notes that the step-by-step procedure described in the draft (see 3.5 below) should be read subject to these comments, and closes on the broader view that space debris will either be resolved in an environment of increased multilateralism, or, unfortunately, remain unresolved for many years to come.

Mahulena Hofmann (German/Czech Branch, 13 July 2026)

Hofmann's comments are largely constructive and technical, and include one substantive suggestion together with recent ITU developments relevant to the Committee's work:

- She raises the possibility of constructing a "presumption of consent," particularly for abandoned space objects, as worthy of further exploration.
- She recommends expanding the discussion of where a public announcement of intent to remove an object should be lodged, suggesting use of Article XI of the Outer Space Treaty and the mechanism for informing the UN Secretary-General; she notes that the ITU mechanism applies only to harmful radio-frequency interference, not to physical proximity as such.
- On the cancellation of frequency protection through the Master International Frequency Register (MIFR), she clarifies that this applies only to non-planned systems, is not automatic but discretionary for the ITU Bureau, and is an extreme measure used very rarely — a nuance the Working Group's draft should reflect.
- She reports that the ITU has not yet adopted general sustainability or space-debris standards, though Recommendation ITU-R S.1003-2 (1993, last updated 2010) provides guidance on end-of-life disposal

orbits for the geostationary orbit (GSO), requiring satellites to be moved to a graveyard orbit at least 200 km above GSO before propellant exhaustion.

- She notes the growing relevance of Low Earth Orbit (LEO) and Very Low Earth Orbit (VLEO, 250–350 km) sustainability: while atmospheric reentry may make VLEO a potentially 'self-cleaning' orbit, this raises unresolved environmental concerns about metallic and chemical residues on reentry, alongside continuing collision risk from orbital congestion; the ITU intends to examine this at the World Radiocommunication Conference 2027 (WRC-27).
- She cites ITU Plenipotentiary Conference Resolutions 218 and 219 (2022), which mandate urgent studies on the long-term sustainability of radio-frequency spectrum and orbital resources (including non-GSO orbits) and commit the ITU to collaborate with UNOOSA on capacity-building and coordination under the "Space2030" Agenda, while avoiding duplication of effort.

4. Working Group 3: Definitions and Terminology

Working Group 3 was asked to consider whether the Committee should provide a list of relevant definitions for its work on space debris remediation and, if so, which terms should be included. Its first internal working paper (12 July 2026) sets out a working method, first-year phases, a preliminary legal-source and standards inventory, and a non-final catalog of terms.

4.1 Working method

The Working Group proposes to proceed by successive, documented narrowing across four workstreams:

- Inventory workstream: collecting relevant treaties, resolutions, principles, guidelines, standards, manuals, national laws and programmatic documents.
- Taxonomy workstream: identifying the universe of potentially relevant concepts.
- Drafting workstream: producing short, consequences-based definitions of core concepts.
- Validation workstream: testing each proposed definition against realistic mission scenarios and against doctrinal concepts in international space law.

A shared rolling drafting table is to record, for each term, the proposed definition, legal source, operational source, unresolved issues and drafting notes — expressly flagging terms used in existing space treaties but left undefined there, so as to distinguish treaty interpretation from new normative choice. Before submission to the full Committee, the consolidated text is to be shared with Working Groups 1 and 2 for feedback, to keep terminology aligned across the Committee's work.

4.2 Legal-source and standards inventory

The Working Group has compiled a preliminary inventory in three parts: (i) binding instruments and authoritative statements of customary international law, including the 1967 Outer Space Treaty, the 1968 Rescue Agreement, the 1972 Liability Convention, the 1975 Registration Convention, the 1979 Moon Agreement, and the 2012 UNIDROIT Space Assets Protocol; (ii) an extensive set of non-binding instruments and technical standards, including the COPUOS Space Debris Mitigation Guidelines and Long-term Sustainability Guidelines, the IADC Space Debris Mitigation Guidelines, ISO 24113 and ISO 24330, the CONFERS lexicon and recommended practices, ESA's Zero Debris Charter, the EU's proposed Space Act, and relevant ITU recommendations; and (iii) a selective national-law appendix (covering, among others, Australia, China and Denmark, with further jurisdictions to be added) illustrating how debris-mitigation and end-of-life obligations are translated into licensing and technical-standard mechanisms domestically. This national material is intended as comparative reference, not as a basis for harmonisation.

4.3 Proposed clusters of concepts

The catalog is to be organised around legal function rather than terminology alone — a definition is useful where it affects authority, consent, jurisdiction, responsibility, licensing, liability, evidence, or commercial implementation. Five clusters are proposed:

Cluster	Focus
1. Treaty-anchored legal-status terms	Who is responsible, who may authorise, who retains jurisdiction and control, which State must be notified. Clarifies that "space object" and "space debris" are not synonyms: debris remains a space object for jurisdiction, control, registration and liability, while forming a distinct regulatory category for remediation and prioritisation.
2. Debris-specific terms	Categories that affect consent pathways, notification duties, prioritisation and evidentiary burdens — to be limited to what is legally necessary, with the remainder left to commentary.
3. Remediation and mission terms	The bridge between law and operations — e.g., whether "space debris remediation" is the umbrella term and "active debris removal" one modality, given that some missions inspect, stabilise, passivate or move objects without permanent removal.
4. Authorisation, consent and responsibility terms	The most legally sensitive cluster — e.g., "deemed consent" or "emergency intervention" — to be drafted only once neutral definitions are separated from underlying policy choices not yet decided by the Committee.
5. Commercial, evidentiary and implementation terms	Terms connecting definitions to proof of performance and market design, relevant to national legislators, licensing authorities, insurers and investors, even where they fall outside a formal definitions article.

4.4 Drafting principles and product structure

Five drafting principles are proposed: define only what has legal consequences; avoid technical thresholds likely to become obsolete; preserve treaty continuity (especially for "space object," "launching State," and "State of registry"); separate legal definitions from evidentiary criteria; and allow technical standards to inform commentary without wholesale incorporation unless the legal effect is clear.

A three-layer product structure is proposed: (i) a short definitions provision for legally operative terms; (ii) explanatory commentary for interpretation; and (iii) a glossary for technical and operational vocabulary — keeping the operative legal text stable while allowing full use of technical material.

4.5 Timeline

The Working Group aims to present, at the 18 August 2026 Vienna meeting, a consolidated drafting table (rather than a finished lexicon) identifying core terms, commentary terms, terms requiring further analysis, and terms to be deferred — explicitly avoiding premature consensus on sensitive concepts such as deemed consent, emergency removal, or the space object/space debris distinction. Subsequent phases run through the drafting of core definitions (September–December 2026), scenario-testing against consent, licensing, ownership, registration, liability and verification scenarios (January–March 2027), and consolidation for the Committee's first- or second-year reporting process (spring 2027).

5. Working Group 4: Economic and Non-Economic Incentives

Working Group 4 was tasked with exploring how (economic and non-economic) incentives for space debris remediation can be created, including through rules that encourage the commercialisation of remediation activities. The group worked through a shared document consolidating individual members' input; it was not able to meet online to discuss the various proposals or the threshold question of whether such incentives should be included in the Committee's final outcome document. Its findings are accordingly offered as a starting point for discussion by the full Committee, rather than as settled conclusions.

5.1 Economic incentives

The economic incentives proposed centre on financial mechanisms that encourage actors across the satellite services chain (launcher, builder, operator) to undertake, or fund, debris remediation:

- Mandatory debris-remediation bonds: operators would pay a fee before launch, refundable on achieving disposal through successful de-orbiting or active debris removal (ADR) — an approach already being explored in China as a security deposit encouraging de-orbiting and safe re-entry. As an alternative (or complement), tax breaks or waived licence fees could reward operators that demonstrate de-orbit or ADR disposal plans before launch, or that are developing and testing relevant technology. A refundable bond was seen as a stronger incentive to follow through, though it may disadvantage smaller operators.
- Launch-cost subsidies for ADR activities — flagged as a fraught option, since it effectively amounts to industrial policy on the part of individual States.
- Market-based mechanisms modelled on the Paris Agreement, notably debris-removal offset credits: an operator paying for debris removal (requiring a means of measuring the quantity removed) would earn credits usable to offset its own debris-generating activities — which would in turn require agreement on limiting such activities.
- An international fund, into which operators would pay upon launching an object into outer space (or, to incentivise use of less congested regions, specifically upon launching into already-crowded orbits), used to finance ADR activities. This could be phased in via national or regional funds before moving to a global fund, applying only prospectively (no retroactivity). Financing models could mirror the XPRIZE Foundation approach (fees proportional to an operator's share of global space activity), with further differentiation by level of economic development, target orbit, crewed/uncrewed status, object mass and altitude, commercial/non-commercial status, and level of mitigation or ADR compliance.

5.2 Non-economic incentives

The non-economic incentives identified are more heterogeneous, and in some cases operate as facilitators rather than incentives in the strict sense:

- Standardised interfaces and common technical requirements, to enable ADR and in-orbit servicing, improve commercial viability, and make operations safer — primarily a task for technical organisations and space agencies, but one that incentives (e.g., technological cross-fertilisation among operators from different States working to common standards) could encourage.
- Use of the Space Sustainability Rating (SSR) system and related certification or labelling schemes (e.g., a “clean space” badge), drawing an analogy to the maritime sector, where insurers condition coverage on ships meeting pollution-prevention standards and certificates. If insurers could be persuaded to insure only operations attaining an SSR — with the SSR itself made more precise, demanding, and explicitly inclusive of ADR activities over time — this would function as a strong quasi-economic incentive. States could alternatively build SSR attainment into licensing conditions; or, as commercial space activity grows, a consumer-facing label akin to the EU's organic (“Bio”) label could let space services market their support for ADR directly to consumers.
- Improved modelling and simulation of the Kessler effect, to be used both in public scientific outreach — building public awareness and demand for action on debris, including ADR — and directly with operators, to demonstrate (e.g., through simple schematics) that mitigation and ADR are more cost-effective long-term than repairing or replacing in-orbit assets. This is acknowledged as a more indirect incentive.

- Narratives grounding ADR in Articles I and IX of the Outer Space Treaty: framing ADR as required, indirectly, by the freedom of exploration and use (Article I), which depends on keeping the space environment explorable and exploitable, and by the due-regard obligation and prohibition of harmful contamination (Article IX). Due regard could be interpreted in line with ICJ jurisprudence on due diligence for the prevention of transboundary harm — which could logically extend to require ADR and similar activities. The Working Group considers that the jurisprudence of international tribunals and international environmental law more generally remain underused resources for developing space law in this direction.

5.3 Question of inclusion in the final outcome document

The Working Group flags, as a threshold issue for the full Committee, whether these incentives belong in the Committee's final outcome document at all. Many of the proposals do not address the legal interpretation of existing international space law or how specific legal questions should be resolved, but instead engage policy and industrial-strategy choices; their inclusion could risk resistance to the outcome document as a whole. The Working Group leaves this question of inclusion — and, if included, in what form (operative text, commentary, or a separate policy annex) — to be resolved by the Committee.

6. Cross-Cutting Observations

- Consent is the connective thread running through Working Groups 1–3 in particular: WG1 lists consent among the minimum matters any national framework should address; WG2 treats the design of consent mechanisms (contractual, administrative/deemed, and emergency) as the central legal and institutional challenge; and WG3 identifies “authorisation, consent and responsibility terms” as its most legally sensitive definitional cluster, to be handled only once policy choices are settled. WG4's proposals (see below) connect to this same thread indirectly, through licensing- and rating-linked incentives.
- Working Groups 1–3 each favour incremental, layered instruments over a single binding treaty at this stage — whether expressed as WG1's tiered resolution (principles / guidelines / UN-level draft principles), WG2's tiered authorisation lanes (contractual / administrative / emergency), or WG3's three-layer structure (definitions provision / commentary / glossary). WG4's own preference for phased, incremental mechanisms (e.g., national/regional funds preceding a global fund) reflects the same pattern.
- Institutional design recurs as a practical priority: WG1 anticipates eventual submission to UNCOPUOS and presentation at UNISPACE IV 2027; WG2 proposes concrete step-by-step identification and notice procedures and flags the need for dedicated institutions; and WG3's inventory work is explicitly intended to keep the Committee's vocabulary aligned with ISO, IADC and ITU developments.
- Genuine disagreement remains on how far unilateral action can go absent consent. The WG2 draft explores salvage, distress, necessity and countermeasure as possible bases for removal without consent, but Kyriakopoulos's comments underline that, under current international law, only the recognised ILC circumstances precluding wrongfulness are settled law — with a broader right of ad hoc removal, or an environmental-protection basis for it, not yet established. This suggests the case for a multilateral SDR mechanism, rather than reliance on unilateral exceptions, is likely to remain a live issue for the Committee's later years of work.
- Technical/regulatory developments outside classical space law — particularly at the ITU (frequency-protection conditionality, MIFR cancellation practice, and the WRC-27 agenda on LEO/VLEO

sustainability) — are increasingly relevant to the legal analysis and should continue to be tracked, as flagged by Hofmann's comments and WG3's inventory.

- WG4's incentive proposals interact directly with WG2's consent architecture and WG1's licensing-related headings: bonds, offset credits, fund contributions, SSR-linked licensing conditions, and the OST Article I/IX narratives are all mechanisms that could be attached to the contractual and administrative consent ‘lanes’ WG2 proposes, and could form part of the licensing, insurance, and financial-responsibility headings WG1 lists as minimum content for national frameworks — suggesting the Committee may wish to cross-reference rather than separately develop these strands.
- WG4's own threshold question — whether policy-oriented incentives belong in a legal outcome document — mirrors, in miniature, WG1's broader choice between binding and soft-law instruments: both reflect a recurring tension in the Committee's work between doctrinal rigor and practical, adoption-oriented flexibility.

Appendix A: Possible Next Steps (For the Committee's Consideration)

The items below are not commitments or actions being undertaken; they are possible next steps that the full Committee may wish to consider, discuss, and decide upon in its own discretion. Their inclusion here does not imply endorsement by any Working Group or by the Committee as such.

- Optional: finalisation of WG1's layered resolution text for discussion at the Vienna Biennial Conference (18 August 2026).
- Optional: incorporation of the Kyriakopoulos and Hofmann comments into a revised WG2 draft, including expanded treatment of the public-announcement mechanism (Article XI OST / UN Secretary-General notification) and of ITU frequency-protection practice, and further consideration of a "presumption of consent" for abandoned objects.
- Optional: continued reflection within WG2 on whether the Committee should prioritise recommending a multilateral SDR mechanism (treaty or international organisation) alongside, or instead of, unilateral consent-substitute pathways.
- Optional: presentation by WG3 of a consolidated drafting table at the Vienna meeting, followed by drafting of core definitions (autumn 2026) and scenario-testing (early 2027).
- Optional: a full Committee discussion, informed by WG4's paper, on whether and how economic and non-economic incentives should feature in the final outcome document — including an online meeting of WG4 members (not yet held) to debate the individual proposals and reach a working position ahead of Vienna.
- Optional: ongoing cross-Working-Group coordination to ensure consistent terminology and mutually reinforcing recommendations ahead of the Committee's second-year report and eventual submission to UNCOPUOS and UNISPACE IV (2027).

Source documents: WG1 Input Paper (1 July 2026); WG2 Draft Text for ILA Vienna 2026 (Irmgard Marboe et al.); Comments by George Kyriakopoulos (11 July 2026); Comments by Mahulena Hofmann (13 July 2026); WG3 Internal Working Paper #01, Consolidated Version (12 July 2026); WG4 Paper on Economic and Non-Economic Incentives (Nicolas Carillo, Vincent Seffinga, Katja Grünfeld, Tanja Masson-Zwaan, Peng Wang, Michael Chatzipanagiotis, and Elvira Prado).

15 Bilaga 5: Sammanställning av arbetsgruppernas svar

WG 1 of the ILA Committee on SDR: *What type of instrument should the committee propose with regard to SDR?*

Input for Consideration by Committee

For attention: Chair Stephen Hobe & Rapporteurs: Rada Popova and Olavo Bittencourt Neto

Building on the seven *Space Debris Mitigation Guidelines,* the International Law Association (ILA) committee explored the various options for the most appropriate normative instrument for Space Debris Remediation (SDR).

Although the optimal solution would be a universal international instrument, it was considered that a binding multilateral Treaty or a non-binding UNGA Resolution would not be possible in the prevailing geopolitical environment. That said, the committee offers a draft set of principles for consideration, within the United Nations at an appropriate level, and at the earliest opportune time.

Keeping in mind the urgency of addressing the problem of space debris remediation and mitigation, the committee recommends in the first instance a soft(er) law approach with proposed practical guidelines/recommendations/standards which can be implemented by national governments or space agencies, and at their earliest convenience.

The committee is aware that States may implement this approach within the whole range of rules or norms available within their respective constitutional orders and jurisdictions. Against this backdrop, the committee offers a set of matters/issues/headings specifying the minimum that should be addressed in any national framework.

The committee will draft a layered ILA resolution the implementation of which will maximise the potential benefit for States, and consisting of:

1. Higher level principles (general) derived from and duly reflecting pertinent international law (*lex lata)*; and
2. A complementing set of high-level guidelines, which may be utilised both in deliberations at the international level and as a source of appropriate legislation comprising, without being limited to, such aspects as licensing, consent, insurance, financial responsibility, confidential information handling, emergency authority, and remedies for non-compliance, etc., as well as potential unilateral commitments with respect to dispute resolution.
3. A draft set of principles that could be considered within the United Nations at an appropriate level, and at the appropriate time.

States should be encouraged to collaborate, through their national or multinational Space Agencies, on refining said guidelines for appropriate consideration.

Should this ILA resolution find favour with States, which will be encouraged to seek advice from their national space agencies and other stakeholders, consideration can later be given to draft a formal set of guidelines, which should —

a) sketch out a blueprint for appropriate national policy and/or legislation based on feedback received, and

b) be submitted to UNCOPUOS for consideration.
c) be presented at UNISPACE IV in 2027.

Technical methods for SDR would be left to evolving standards and mission practice. However, the committee will, as necessary, liaise and share any relevant technical information that comes to light with the *International Organisation for Standardization* and the *Inter-Agency Space Debris Coordination Committee*.

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ILA Committee on Space Debris Remediation

Draft paper for discussion at the ILA Biennial Conference in Vienna, 18 August 2026, 9-10:30 am, Sem 33, Juridicum, Vienna

Irmgard Marboe

Working Group 2:
"Should a third party be permitted to remove others' space debris?"

Members:

Irmgard Marboe (Austrian Branch), Mahulena Hofmann (Luxembourg/Czech Branch), Marco Pedrazzi (Italian Branch), Olavo de Bittencourt (Brazilian Branch), Alla Pozdnakova (Norwegian Branch), George Kyriakopoulos (Greek Branch), Duncan Blake (Australian Branch)

1. Background

The proposal to the Executive Council of the International Law Association (ILA) for the establishment of a Committee on "Legal Aspects of Space Debris Remediation" by Stephan Hobe (German Branch) of April 2024 contained the following text related to the topic of WG2:

> Therefore, majority opinion seems to be that objects, including space debris, cannot be removed *without consent of the registering State and/or object owner*.[1] However, States and/or owners may not always be able or willing to give consent for various reasons (trade or state secrets etc.). On the national level, injuring ownership rights may result in contractual liability. On the international level, the International Court of Justice has declared that an intrusion into the jurisdiction of another State amounts to a violation of international law, incurring state responsibility.[2] Moreover, some objects may be unidentifiable, which, however, as shown by State practice, does not mean jurisdiction and/or ownership have disappeared. It remains unclear whether (concrete) legal principles exist mandating that States for reasons of *environmental protection*, *necessity*, *distress or securing free exploration*, *use* and *access to the international common*

[1] See for example Manfred Lachs, The Law of Outer Space (2010) Martinus Nijhoff, p. 66; Mick Schmidt-Tedd, 'Article VIII' (2009) in Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, Gérardine Meishan Goh (eds.) *The Cologne Commentary on Space Law* (Vol. I) (Carl Heymanns, 2009), p. 156-163; Gordon Chung, '*Jurisdiction and Control Aspects of Space Debris Removal*' (2019), in Annete Froehlich (ed.), *Space Security and Legal Aspects of Active Debris Removal* (Springer, 2019).

[2] ICJ, Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America), Judgment of 27 December 1986 (ICJ Reports 1986, p. 14).

> *area* of outer space required by Article I of the Outer Space Treaty, permit space debris remediation. (emphasis added)

In early 2026, the chair of the Committee circulated a questionnaire containing the following question (as Q3):

"Should a third party be permitted to remove others' space debris?"

At the online meeting of the Committee on 27 April 2026, the Chair summarized the replies to question Q3 as follows:

> The legality of debris removal (i.e., removal of foreign space debris) by third parties was highly disputed. The majority of opinions centred on the recommendation to allow such removal only under clearly formulated conditions, including, among others, the (advance) consent of the operator of the relevant space object.

The Committee decided to establish Working Group 2 to deal with Q3.

2. Replies to questionnaire

The replies to Q3, in more detail, by Committee members included the following:

Tanja Masson-Zwaan (Dutch Branch):
Not unless there is explicit permission, and a contract clearly spells out the liability arrangements etc.

Marie-Clotilde Runavot (French Branch):
Here again, we face the issue of jurisdiction and therefore of the control of the State of registration over space objects launched into space. But a related legal issue is that of identifying the State of registration itself… For smaller debris, it is not certain that this is possible. Added to this is the question of a possible safety exception, which would allow derogation from the requirement of consent from the State of registration (if identifiable).

Gabor Sulyok (Hungarian Branch):
Under strictly defined conditions, yes. For the foreseeable future, space debris remediation will remain a capability possessed only by a few stakeholders. The number of stakeholders generating space debris is and will be incomparably larger than the number of those able and willing to actively remove space debris. Keeping that in mind, it is difficult to conceive of effective space debris remediation without permitting third parties to remove foreign space debris. Having said that, I must emphasize once again that the conditions for removing foreign space debris have to formulated with extreme caution, and compliance must be subject to strict, effective and continuous supervision. The identification and formulation of these conditions appear to be one of the principal tasks of this Committee.

Theunis Kotze (South African Branch):
Yes, I believe SDR will only function properly if there is commercial incentive and inevitably that would involve a third party being involved.

Mahulena Hofmann (Luxembourg/Czech Branch):
Yes in case of consensus; if it is missing, only in emergency (see sea law and the customary principles of necessity and the protection of human life at the sea).

Dirk Haupt (Swedish Branch):
Yes, but only within a licensing architecture that rejects free-salvage analogies. As a *de lege lata* starting point, removal of identified foreign debris ordinarily requires the consent of the State of registry, together with due regard for any continuing ownership and security interests. The Committee's *de lege ferenda* task is therefore not to assume away consent, but to design mechanisms by which consent can be standardized, given in advance, or—where States have expressly opted in—presumed under tightly specified conditions.

I would recommend a tiered authorization structure:

• First, there should be a **contractual lane**: removal of identified foreign debris pursuant to express mission-specific consent, preferably documented through standardized clauses addressing access, liability allocation, data protection, and verification, or better yet standing consent recorded in advance through a registry or framework arrangement for identified classes of objects.

• Second, there should be an **administrative lane** for hard cases, but only where the State of registry has accepted in advance—by treaty, framework arrangement, or standing declaration—that specified categories of non-responsive, abandoned, or high-risk debris may be handled through a deemed-consent procedure. Within such an opt-in framework, the law could allow tightly cabined deemed consent after diligent identification efforts, formal notice through designated channels, a defined waiting period, and a reasoned administrative determination by the competent authority.

• Third, there should be an **emergency stabilization lane** allowing only those temporary, least-intrusive measures that are strictly necessary to avert grave and imminent harm. Irreversible removal or disposal should still require prior authority unless an applicable international arrangement expressly provides otherwise.

Two safeguards are indispensable:

• First, only operators licensed under a heightened authorization category should have access to these pathways, with ex ante screening for cybersecurity, export-control compliance, insurance, and chain-of-custody or equivalent handling procedures.

• Second, remediation authority should not imply salvage title. Unless expressly agreed otherwise, the operator is paid for a service; remediation must not imply transfer of title, access to protected payload data, or a right to exploit proprietary technology.

Preliminary Conclusion. A third party should be allowed to remove foreign space debris, but only through a licensed, consent-centered, and security-screened system that also includes narrowly framed deemed-consent and emergency procedures.

3. Draft analytical summary

The responding Committee members put considerable weight on the need for consent to any active removal of space debris. The main reason is Article VIII of the Outer Space Treaty which provides:

> A State Party to the Treaty on whose registry an object launched into outer space is carried *shall retain jurisdiction and control over such object*, and over any personnel thereof, while in outer space or on a celestial body (emphasis added).

This means that 'jurisdiction and control' over a space object is exclusive to the State of registry.[3] However, it is not entirely clear how these terms should be interpreted and applied in the context of active space debris removal. Should a termination of jurisdictional power be possible?[4]

Furthermore, the relationship between 'jurisdiction and control' and 'ownership' needs to be examined. Article VIII merely clarifies that ownership rights are not affected by the presence of objects in outer space, as it stipulates:

> Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth.

Registration is therefore independent from ownership.[5] This is obvious with respect to registered space objects owned by private persons, which are considerably growing in number in recent years, or by international organizations. It is less clear with respect to registered space objects owned by States. They generally would not let their space objects register by another State – so that 'jurisdiction and control' and 'ownership' in these cases overlap.[6] Nevertheless, it is important to note that legal aspects of ownership rights of space objects and possible violations thereof are not governed by

[3] Chung, 'Jurisdiction and Control Aspects of Space Debris Removal (2019) 37.
[4] Chung, ibid, 38-45.
[5] Chung, ibid, 39; Schmidt-Tedd and Mick, CoCoSL (2009) n. 82.
[6] Commentators address the case of State-owned space objects, when they alude to the removal of space objects as a possible 'threat or use of force' or even an 'act or aggression'. See, for example, Su, Possible Ways Forward (2016) 408-409.

Article VIII Outer Space Treaty but must be analyzed under general international law or applicable national law.

a. The meaning of 'jurisdiction and control' in Article VIII

In general international law, the term 'jurisdiction' determines the State's right to prescribe, adjudicate, and enforce its own laws.[7] This includes the exercise of legislative, executive and enforcement jurisdiction. Based on Article VIII Outer Space Treaty, these rights are accorded to a State over a space object that it has registered.[8] The legal consequence of jurisdiction and control is the applicability of the national law of the State of registry for the object launched into outer space, including civil and criminal law as well as intellectual property rights.[9]

In contrast, the term 'control', does not have a specific meaning in general international law. It is a special term of international space law to emphasize the factual connection between the State and the object.[10] It also denotes the legal right to supervise the space objects' activities, in addition to the actual possibility to do so.[11] Commentators agree that 'jurisdiction and control' in Article VIII should be read in totality and not in parts, as a combination of legal and factual relationship. The definition by *Lafferanderie* finds broad support which describes the connection between the two as: 'Jurisdiction should induce control, and control should be based on jurisdiction'.[12]

'Jurisdiction and control' allow the exercise of sovereign rights,[13] but must be distinguished from having 'sovereignty' over a space object. 'Sovereignty' under international law denotes exclusive legal title. It is closely linked to territory and signifies independence and 'the right to exercise therein, to the exclusion of any other State, the functions of a State.'[14] A space object is not the territory of a State, if it is in its register. Its legal status is rather similar to that of ships and aircraft, which do not become the territory of the State of registration. Instead of 'quasi-territorial jurisdiction', which commentators sometimes use, it is preferable to understand the relationship between the State and the space object (or ship or aircraft) as 'quasi-personal jurisdiction'.

[7] See, as examples of recognized textbooks of international law: Crawford, Brownlie's Principles of Public International Law (2019), Chapter 20.2; Shaw, Malcolm, International Law (2026).
[8] Schmidt-Tedd and Mick, CoCoSL (2009) n. 48-50.
[9] Schmidt-Tedd and Mick, CoCoSL (2009) n. 59.
[10] Lachs (1972, repr. 2010) 69 f.
[11] Stewardson and Freeland, Inevitable (2020) 149.
[12] Lafferanderie, 'Jurisdiction and Control' (2005) 231; see Schmidt-Tedd and Mick, CoCoSL (2009) n. 48; Chung (2019) 33; Grüner, Active Space Debris Removal (2026) 121.
[13] Schmidt-Tedd and Mick, CoCoSL (2009) 156-158.
[14] Island of Palmas (Netherlands/USA) (1928), 2 RIAA 829, 838–839 (Arb. Huber); this classical definition is referred to in numerous textbooks on international law, such as Crawford, Brownlie's Principles of Public International Law (2019), Chapter 20.2; Shaw, Malcolm, International Law (2026)

The State of registry does not have 'exclusive legal title' over the space object. As already mentioned above, the space object may be the property of a private person or an international organization. Nevertheless, the State of registry has the right to exercise 'jurisdiction and control' over the space object, which it does not necessarily own.

This interpretation is in accordance with the wording of Article VIII and the object and purpose of the Outer Space Treaty.[15] According to its preamble, the Outer Space Treaty aims to contribute to broad international co-operation in the exploration and use of outer space and to the strengthening of friendly relations between States and peoples.[16] States are therefore the primary addressees of the specific rights and obligations contained in the Outer Space Treaty. This does not change with the increasing presence of private actors in outer space.

The expression 'jurisdiction and control' denotes an 'aspect of sovereignty',[17] but the State of registry does not and does not need to 'have sovereignty' over the space object. Some commentators use the term 'sovereign rights' to describe the rights of the State in relation to the space object registered by it.[18] Some sharpen this be stating that 'any attempt by a third party to remove that object could be seen as a breach of sovereignty'.[19] Yet, this does not necessarily mean that such removal automatically amounts to unlawful 'intervention'. Moreover, only in rare cases can the removal of a space object be regarded as a 'threat or use of force' or even an 'act of aggression'.[20]

Yet, the right to jurisdiction and control of the State of registry is exclusive.[21] Any interference with this right by another State carrying out or authorizing a mission to remove the space object from its orbit, would represent a violation of the rights of the State of registry under international law. As the Permanent Court of International Justice in the *Phosphates in Morrocco* case described acts 'contrary to the treaty rights of another State' as internationally wrongful acts.[22]

The right to 'jurisdiction and control' is generally regarded as permanent.[23] This raises the question whether a State can transfer or derelict space objects. While the former is generally seen as an exercise of the right to jurisdiction and control, the latter *prima facie* seems to be excluded, because the State cannot get rid of its obligations as a

[15] Applying the rules of treaty interpretation enshrined in Art 31 (1) of the Vienna Convention on the Law of Treaties, opened for signature on 23 May 1969, enterd into force on 27 January 1980, 1144 UNTS 331.
[16] See preambular paragraphs 4 and 5 of the Outer Space Treaty.
[17] Chung (2019) 33; Schmidt-Tedd and Mick, CoCoSL (2009) n. 46.
[18] See, for example, Bittlinger (1988) 23-24, and Grüner (2026) 121.
[19] Weeden, Space Policy (2011) 41.
[20] For example, the removal of a military space object may amount to a threat or use of force prohibited by the UN Charter. Attacks by a State's armed forces on the 'space forces' or 'space fleets' of another State may amount to aggression. Su (2016) 409.
[21] Chung (2019) 37.
[22] *Phosphates in Morocco (Italy v. France),* Judgment of 14 June 1938, PCIJ Series A/B, No 74, 28.
[23] Jasentuliyana (1999) 204; Chung (2019) 33, 40.

launching State, in particular its liability for damage under Article VII of the Outer Space Treaty, so that its right to jurisdiction and control also need to stay intact.

However, consent between the State of registry and another State carrying out or authorizing the removal could change such an assessment. An agreement could be regarded as an exercise of the right to jurisdiction and control, or as 'consent' in the sense of Article 20 of the ILC Articles on State Responsibility of 2001 that would preclude the wrongfulness of an act of a State interfering with the rights of another State.

b. The importance of registration

The right to 'jurisdiction and control' conferred under Article VIII hinges on national registration of the space object. International registration of a space object is not decisive.[24] A lack of international registration does not mean that the space object is not registered at all.

State parties to the Registration Convention are obliged to register a space object with UNOOSA (on behalf of the Secretary-General of the United Nations) is contained in Article IV of the Registration Convention.

However, a failure by a State 'to furnish' such information 'as soon as practicable' does not impair its right to 'jurisdiction and control', as long as the State has registered the object in its national registry. Non-State parties to the Registration Convention may register their space objects based on General Assembly Resolution 1721B (XVI), for which UNOOSA has established a separate register.[25]

In contrast, if national registration is missing, no State has jurisdiction and control over the space object. Some commentators suggest that, in absence of registration, 'the act of launching and the ownership of the object may become highly relevant in determining the state with "jurisdiction and control" over it'.[26] However, this seems to be a misunderstanding based on criteria for identifying the launching State of a space object for liability purposes. For identifying the liable launching State, it is not necessary that the State has registered the space object, but the right to 'jurisdiction and control' requires at least national registration.

The removal of a space object that is not registered in any national space registry does not require consent by any State. If such an object is identified, its removal by a third State would *prima facie* be lawful under international space law. If such a non-registered space object is owned by a State, such as a military satellite, the question of interference with State property needs to be examined under general international law. If

[24] Schmidt-Tedd and Mick, CoCoSL (2009) n. 46.
[25] United Nations General Assembly Resolution 1721 (XVI), International Co-operation in the Peaceful Uses of Outer Space (1961).
[26] See Chung (2019) 38.

the space object is owned by a private person, applicable property rights may be violated. International law may play a role, too, because of the possibility of the owner's home State to exercise diplomatic protection. Special legal questions arise, if the space object's owner is an international organization, such as the European Union.

The first important step is therefore the identification of a State of registry of a selected space object, which raises both technical and administrative challenges. The establishment of dedicated procedures and institutions appears to be necessary and useful.[27]

The removal of space objects that are not registered or whose State of registry cannot be identified should not be underestimated for the purpose of space debris remediation. The number of space objects without any identified State of registry is not negligeable. It could be a suitable tool to reduce space debris without the need for consent and without the risk of violating the rights of any State.

c. How to achieve consent

A State of registry of a space object may not wish to give its consent for a removal by another State, even if the object is not any more functional. In order to find agreement between the two States several questions needed to be clarified.

The Committee's task may be to design mechanisms by which consent can be standardized, given in advance, or – where States have expressly opted in – presumed under tightly specified conditions. (The proposals below are based on the answers to Q3 by Dirk Haupt, Swedish Branch):

i.) Agreement: contract or treaty?

In order to make consent for active debris removal predictable, tailored agreements for specific missions could be developed. Before an operator interferes with a non-functioning satellite or debris owned by another State, the parties could conclude a mission-specific agreement that gives explicit permission and spells out the operational and legal rules. As unilateral capture or deorbiting can trigger responsibility and liability, an agreement helps to remove ambiguity by authorizing access and operations, coordinating approach and handover procedures. It could also specify how telemetry is shared and how safety is verified.

Just as importantly, the agreement could allocate risk. It could clarify which party bears fault-based or absolute liability exposure, set insurance requirements, include waivers of claims, and lay down notification and claims-handling processes. Because debris removal can reveal sensitive design or operational data, the agreement could also

[27] See further below on 'Possible procedures and institutions'.

protect data and intellectual property, limit use of any sensed information, and address export control and cybersecurity.

To build trust, the agreement could include verification and transparency mechanisms, such as agreed monitoring, post-mission reporting, and on-orbit identification showing the operator stayed within authorized bounds. Finally, such an agreement could link the activity to national authorization and supervision obligations, incorporate debris mitigation and passivation standards, and provide dispute resolution and governing law provisions.

An alternative could be a standing arrangement. Instead of negotiating from whenever a collision risk emerges, a State could record advance consent for defined categories of its derelict objects together with conditions on methods, safety thresholds, notification timelines, data handling, and the right to pause or revoke consent if circumstances change. This can be organized as a centralized consent registry or embedded in bilateral or multilateral framework agreements. By publishing eligibility criteria and operational conditions in advance, the framework could reduce transaction costs and provide reliable lead times for operators and insurers, enabling rapid intervention when imminent risks arise and building confidence that expectations are aligned.

The general idea behind this proposal is to develop rule-governed cooperation on the basis of prior consent, including on liability, safety, and information protection, so that active debris removal can proceed lawfully and quickly, while respecting ownership, jurisdiction, due-regard obligations, and the interests of all States involved.

ii.) Authorization

Another solution could be to create a non-contractual pathway for authorizing active debris removal in situations where negotiating a mission-specific consent is impractical.

The core idea is an administrative ‘deemed-consent’ mechanism that operates within a treaty, framework agreement, or standing declaration. By opting in, the State of registry pre-accepts that defined categories of objects – such as non-responsive satellites, abandoned upper stages, or debris assessed as high risk – may be handled through an administrative process that treats consent as granted after strict procedural steps are satisfied.

The proposal is narrow and consent-based. No State would be subjected to deemed consent unless it has first agreed to the framework and specified the object classes and conditions to which it applies. Within that agreed scope, the removing State or its authorized operator would undertake diligent identification efforts to confirm the object’s identity, ownership, and status. It would then provide formal notice via designated channels – such as national focal points, diplomatic notes, or a UNCOPUOS- or ITU-recognized portal – containing the technical basis for action, proposed methods, safety measures, and anticipated timelines. A defined waiting

period would follow, allowing the registry State to acknowledge, object, or provide operational input. If no timely, substantiated objection arrives, the competent authority in the removing State could issue a reasoned administrative determination that the criteria for deemed consent have been met and authorize the operation.

This 'lane' is designed to address hard cases where collision risks are dynamic and time-sensitive, yet political or practical barriers make bespoke consent unattainable. It could preserve due process through identification standards, transparent notice, a cooling-off period, and a written decision grounded in technical evidence and pre-agreed criteria. It also anticipates accountability: the determination can be published or notified to the registry State and relevant international bodies; conditions can be attached to ensure proportionality, safety, and minimal interference; and the framework can include an objection or suspension mechanism, post-operation auditing, and remedies if the operator strays beyond its authorization.

This proposal builds on the Outer Space Treaty's emphasis on cooperation and due regard while respecting jurisdiction and control by making prior, explicit opt-in the foundation for deemed consent. It reduces delays for predictable categories of high-risk debris and could support uniform practice through standardized procedures and timelines. It would provide clarity to operators and the general public. As it is limited to pre-specified objects, it retains the registering State's ability to tailor the framework's reach.

d. Exceptions to the need for consent

If a State of registry does not give its consent to remove its space object or if circumstances do not allow the determination of the State of registry – or not in time – the question arises whether the removal of a space object by a third party can nevertheless be lawful. It is necessary to analyze whether a State or other actors are entitled to intercept a space object without consent of its registering State, if the hazard presented by the object threatens the safety of other space activities, or causes potentially harmful interference with the activities of another legal entity.[28]

i.) Salvage

The removal of space debris without consent appears to involve similar situations as maritime 'salvage'. Authors have analyzed possible analogies and concepts that may be useful for future legal development.[29]

[28] Chung (2019) 42, with further references.
[29] Al Anzaldua and Michelle Hanlon, Maritime Tradition (2018); Jasentuliyana, Space Salvage operations (1999) 208-213; Fishman, Space Salvage (1986) 978-988; De Saussure, Right to Reorbit (1978) 383-394.

Maritime salvage law is based on the common law notion of a 'derelict', a thing which is abandoned and deserted at sea by those who were in charge of it, without hope on their part of recovering it (*sine spe recuperandi*) and without intention of returning to it (*sine animo revertendi*).[30] For it to be considered a derelict, a ship, craft or vessel must be abandoned. To meet the requirements for abandonment, four criteria must be fulfilled:

a) The abandonment must take place at sea, not on the coast;

b) *Sine spe revertendi aut recuperandi* (without hope of return or recovery);

c) It must be *bona fide* and for the purpose of saving life;

d) By order of the master in the face of danger from damage to the ship and the state of the elements.

Transposed to orbit, a satellite could be deemed 'derelict' once its active lifespan permanently ends, permitting third-party retrieval with a service-based claim against the owner. Inoperative space objects might be considered abandoned and thus not subject to national jurisdiction in certain circumstances.[31] As in maritime salvage law by analogy, owners would not lose proprietary rights in the space object or component part even if those objects are not controlled or controllable anymore.[32]

To reconcile this with Article VIII Outer Space Treaty, a legal rule could be developed declaring intact, non-functional objects 'derelict', opening them to salvage (including relocation to graveyard orbits), while allowing a longer window for owner reactivation or retrieval. Salvage would thus clear congested orbits without stripping owners of title, aligning with maritime practice.

However, commentators have pointed out that salvage-based inferences of abandonment or third-party removal contradict the clear text of Article VIII and cannot be read in absent an explicit treaty qualification.[33] Disuse or loss of control do not equal abandonment. Such a presumption would grossly run counter to the text and purpose of the Outer Space Treaty. Its strict liability regime for damage caused by space objects under Article VII cannot and should not be easily be circumvented by any deliberate or presumed 'abandonment' of a space object.

Moreover, protected interests and legal relationships are different in maritime salvage law and space law. Maritime salvage law focuses on protecting property rights of the shipowner and rewarding rescuers. In orbit, the core issue is not interference with property rights but safeguarding the freedom of other States to use outer space which is guaranteed under Article I Outer Space Treaty. The relationship is thus between the

[30] Jasentuliyana, Space Salvage Operations (1999) 208, referring to Kennedy, *Law of Salvage* (Stevens & Sons 1985) 85-86.
[31] See also Chung (2019) 41; De Saussure (1978) 383; Fishman (1986) 965.
[32] Jasentuliyana, Space Salvage Operations (1999) 203-204.
[33] De Man, Disued Staellites (2017) 453.

State of registry and other users' freedom, and not between the shipowner and a salvor.[34]

Some basis for an analogy of salvage law to active debris removal may be found in Article 5 (4) of the Rescue Agreement which states that:

> [A] Contracting Parties which has reason to believe that a space object or its component parts discovered in territory under its jurisdiction, *or recovered by it elsewhere*, is of a hazardous or deleterious nature may so notify the launching authority, which shall immediately take effective steps, under the direction and control of the said Contracting Party, to eliminate possible danger of harm (emphasis added).

This rule may be applicable to a space object 'of a hazardous or deleterious nature' that was recovered by a State 'elsewhere'. The provision requires that the launching State is informed which then shall 'immediately take effective steps, under the direction and control of the said Contracting Party, to eliminate possible danger of harm'. According to Article 5 (5), expenses incurred in fulfilling obligations to recover and return a space object shall be borne by the launching authority.

However, commentators have criticized that reliance on Article 5 of the Rescue Agreement is not appropriate, because it addresses hazardous objects that have landed on Earth – in the territory under a State's jurisdiction or 'elsewhere'.[35] It could not be used to establish a salvage regime for non-functional satellites left in orbit without any treaty amendment.

Instead of trying to amend the existing UN space treaties, an international expert body could issue technical standards and recommended practices – modeled on the International Maritime Organization's approach to salvage – to define derelict status, authorize operations, and structure awards, enabling timely, adjustable governance. This standards-based regime could unlock safe, compensated removals while respecting existing treaty rights.[36]

ii.) Distress

Under the ILC Articles on State Responsibility, 'distress' (Article 24) precludes the wrongfulness of conduct when a state agent has no other reasonable way to save their life or the lives of persons under their care, provided the situation is not due to that state's own conduct and the measures taken are strictly limited to the exigencies of the situation.[37] Applied to space operations, distress can justify the emergency removal or alteration of a non-functioning satellite or debris when it presents an imminent,

[34] De Man, Disued Staellites (2017) ###.
[35] De Man, Disued Staellites (2017) 456-457.
[36] Jasentuliyana, Space Salvage Operations (1999) 210-213.
[37] ILC Articles on Responsibility of States for Internationally Wrongful Acts, with commentaries (2001), Article 24 and Commentary, paras 1-8.

concrete threat to human life – such as a high-probability conjunction with a crewed spacecraft (e.g., the ISS) or an uncontrolled reentry threatening populated areas.

Ordinarily, seizing, towing, or deorbiting another state's space object without consent could violate international obligations, including respect for the launching state's 'jurisdiction and control' under Article VIII of the Outer Space Treaty and the general duty of due regard, as reflected in Article IX. Distress can preclude the wrongfulness of that otherwise impermissible interference if four strict conditions are met, drawn from Article 24 and its commentary: [38]

1. Imminent peril to life: The risk must be immediate and grave, directed at astronauts or people on Earth, not merely to property or the space environment.
2. No reasonable alternative: There is insufficient time for consent, maneuvering of other assets, or less intrusive mitigation. All feasible coordination steps are taken concurrently.
3. No contribution by the acting state: The peril is not attributable to the acting state's prior conduct (e.g., it did not create the debris or cause the failure).
4. Proportionality and temporariness: The operation is the minimum necessary to remove the danger (e.g., brief capture and retargeting), ceasing once the threat is neutralized. It must not create a comparable or greater peril.

Practically, the acting state should urgently notify and coordinate with the launching state, relevant operators, and international partners. It should document the necessity, prefer reversible, limited interventions, and share post-incident data.[39] While distress is narrow and life-specific, it could provide legal justification for emergency debris remediation when human life is at stake, and no other reasonable means exist.

iii.) Necessity

Under Article 25 of the ILC Articles on State Responsibility, 'necessity' may preclude the wrongfulness of an act if (a) it is the only way for the State to safeguard an essential interest against a grave and imminent peril, and (b) it does not seriously impair an essential interest of the State(s) toward which the obligation exists or of the international community as a whole. Necessity is unavailable if the relevant obligation excludes it, or if the State contributed to the situation of necessity. The plea is exceptional, to be interpreted strictly.

Applied to space activities, necessity could justify removing or altering a non-functioning satellite or space debris – without prior consent – where the object poses a

[38] Ibid; see also Crawford, *State Responsibility: The General Part* (2nd ed., 2019), 304–311.
[39] UN COPUOS, Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space (2010), para. 5 and Annex (coordination and risk mitigation).

grave and imminent peril to an essential interest of the acting State, and no other means can avert it in time.

Essential interests may include: protection of human life (e.g., its astronauts aboard a crewed vehicle or station), preservation of critical national infrastructure (e.g., a navigation or weather constellation vital to public safety), or protection of the State's population from an uncontrolled reentry threatening its territory. The 'only way' requirement is exacting: the State must show that less-intrusive alternatives – maneuvering its own assets, waiting for consent, conjunction avoidance, or passive shielding – are not reasonably available within the temporal window of the threat.

Any operation must not seriously impair the essential interests of other States or the international community – for instance, by creating additional debris or disabling another State's critical asset. Proportional, targeted measures (e.g., a minimal capture-and-reorbit) and urgent notification/coordination help satisfy this limb and the due-regard obligations under outer space law. Necessity will be excluded if the acting State helped create the peril (e.g., via an ASAT test generating the debris). While the Outer Space Treaty's jurisdiction-and-control and due-regard rules constrain unilateral actions, they do not expressly exclude relying on necessity. Nonetheless, the bar remains high, fact-specific, and subject to ex-post scrutiny.

iv.) Countermeasure

A State which does not give consent to the removal of a hazardous inoperable space object arguably violates its obligation of paying 'due regard' to the interests of other States enshrined in Article IX Outer Space Treaty.[40] It imposes a duty to undertake space activities with a standard of care, taking in consideration the rights and legitimate interests of all other nations.[41]

Moreover, it can be argued that keeping non-functional space objects in orbit excludes other users from accessing scarce orbital positions and frequencies without any concurrent, justified 'use', turning the space object into a place-saving object and making the practice the functional equivalent of appropriation prohibited by Article II, contrary to the freedom of use guaranteed by Article I Outer Space Treaty.[42] Maintaining a space object in orbit without use may amount to prohibited appropriation of outer space. While jurisdiction and control over the space object may persist, the State of registry has an obligation to remove it from orbit to clear the resource for others, otherwise it violates the non-appropriation principle. Exclusion without use denies others' freedom to use space and constitutes unlawful appropriation.[43]

[40] Chung (2019) 42, De Saussure (1978) 390.
[41] Marchisio, CoCoSL (2009) 175.
[42] De Man, Disued Staellites (2017) 456-457.
[43] De Man, Disued Staellites (2017) 465, with further references.

The ITU regime reinforces this logic: international protection from harmful interference is conditional on actual and continued operation in the notified orbital position.[44] A rigorous enforcement of ITU Radio Regulations should tie international protection strictly to actual operation at the notified orbital position. When drift or inactivity is detected, the ITU Bureau should query the administration and, if unsatisfied, cancel the MIFR assignment. This objective process would identify disuse and treat keeping non-functioning satellites as an abuse akin to paper satellites. Although cancellation alone does not give the right to remove the space object from orbit, it removes protection and, read with Outer Space Treaty principles, renders refusal to clear the slot unlawful, creating a duty to deorbit or re-orbit to a graveyard.

The removal of the space object could therefore represent a countermeasure in accordance with Article 49 of the ILC Articles on State Responsibility.[45] The conditions for lawful countermeasures include procedural and substantive criteria, which need to be carefully assessed on a case-by-case basis.

For the legality of the countermeasure, it is important to identify the injured State (can it be 'any State', is there an obligation *erga omnes*?), the unsuccessful attempts of negotiation, the proportionality of the measure, the exclusion of the use of force and other limitations.[46] The analysis must also address whether the removal of the space object complies with the obligation that the resumption of performance of the obligation in question must be possible.

The reliance on a countermeasure arguably requires the balancing of competing interests of State in the conduct of outer space activities: On the one hand, the protection of exclusive jurisdiction and control of a State of registry, and, on the other the safety of space operations by other countries.[47] Such a balancing exercise could be reflected in the assessment of the 'proportionality-test' of the countermeasure.

Commentators suggest to develop a hierarchy of needs or a system of priorities, which should include: (a) the prevention of life-threatening dangers, (b) the maintenance of international peace and security in outer space, (c) the advancement of a state's interests (including strategic and economic interests).[48] With respect to category (a), international space law should allow to remove space debris belonging to another in a situation in which human life is directly threatened. Concerning category (b), the concept of 'peace and security' could go beyond the traditional inter-State conflict model and include also the environmental degradation caused by space debris. Cases

[44] De Man, Disued Staellites (2017) 458-463, with fruther references.
[45] United Nations General Assembly, 'Responsibility of States for internationally wrongful acts', Res 56/84, UN Doc A/RES/56/83, 12 December 2001, Annex (ILC Articles on State responsibility).
[46] International Law Commission, 'Draft Articles on Responsibility of States for Internationally Wrongful Acts, with commentaries' Yearbook of the International Law Commission 2001: Volume II Part 2 UN Doc A/CN.4/SER.A/2001/Add.1, Part Two (ILC Commentary), Chapter II.
[47] Chung (2019) 42-45.
[48] Chung (2019) 44 with further references.

in respect of category (c), when and how a State may remove the registered space object of another for strategic and economic interests, appear more controversial. They should, however, not represent major obstacles, in particular, if the State or other actors removing the object are ready to bear the costs.

e. Possible procedures and institutions

Dedicated debris removal activities by space faring nations could serve the long-term sustainability of outer space activities and be for the benefit of all States. Such activities may eventually transform environmental challenges into 'business opportunities' for the global space sector, specifically by facilitating the development of novel technologies for space debris mitigation and the design of non-debris generating missions.[49]

Active debris removal could provide opportunities, if procedures and institutions ensure legal certainty and predictability. These still need to be developed.

A step-by-step approach could include:[50]

1. Identification of the object to be interacted with
2. Consultation of the UN registry to see which State has registered the object
3. If no registration, request to States with SSA tracking facilities for information/assistance in identifying the object
4. If still no resolution, public announcement about
    a) Intention to interact with the object and how
    b) Orbital parameters of the object and characterization
5. Waiting period (30 days?) for any State of registry to come forward
    a) If one does → try to find agreement/consent
    b) If none → proceed with plan

A future institutional design could operationalize consent-centered active debris removal through layered pathways. Core procedures should include object identification, registry checks, and SSA-assisted attribution. Moreover, public notice of intent and waiting periods are advisable where no State of registry is identified.

Mission-specific contracts and standing consent registries could standardize authorization, allocate liability, and verify compliance.

[49] Chung (2019) 45.
[50] Based on Weeden, Overcoming (2019), referring to B. Weeden, 'How Do I Ask Permission to Engage With A Piece of Space Debris ?" 3rd European Workshop on Space Debris Modelling and Remediation, Paris, France, 16-18 June 2014.

An opt-in administrative deemed-consent mechanism could allow removal of defined categories of non-responsive or high-risk objects after diligent identification. This needs to be combined with formal notice, a waiting period, and a reasoned decision by a competent authority. Publication, possibilities for objection, and monitoring mechanisms could help to ensure accountability.

Emergency stabilization should be narrowly available for grave, imminent risks to life, limited to temporary, and least-intrusive measures. In such cases, evidence requirements for documenting the urgency are needed.

Finally, it seems to be advisable to select and license qualified operators under heightened authorization requirements and security screening.

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Thank you for the excellent draft text within the WG2 framework. It sets out the core issue clearly and comprehensively, provides an excellent description of the limitations and proposes some interesting solutions.

Below are a few comments on the issue as a whole from my perspective:

In light of current international and space law, the only certainties regarding a third party's ability to undertake the active removal of a space object that has become space debris appear to be the consent of the registering state and the circumstances that would preclude such an action from being considered wrongful under the law of state responsibility (e.g. consent, self-defence, countermeasures, force majeure, distress or necessity). I would not include the need to protect the environment here, to which the initial proposal alludes, because this would imply recognising the ability of states to act within an international framework 'in the interest of the community' (*actio popularis*)[1].

Ωστόσο, αυτές είναι βάσεις δράσης που ήδη ήταν γνωστές – και μπορούσαν να εφαρμοστούν – εκ του γενικού διεθνούς δικαίου. Κατά τα λοιπά, το βασικό πρόβλημα – αφαίρεση debris από τρίτο Κράτος – παραμένει στην ολότητά του.

Regardless of how the relationship between the state of registration and the registered space object is defined specifically (as quasi-territorial or quasi-personal jurisdiction), the state in question is the only one that exercises jurisdiction and control over the space object. This in itself constitutes a serious obstacle to any attempt to recognise the right of a third state to remove a space object from orbit. This is acknowledged in the text a little further on. ("Yet, the right to jurisdiction and control of the State of registry is exclusive", p. 6).

As for unregistered space objects, I would have reservations about whether any removal would be *prima facie* lawful. This is because the issue of a third State unilaterally removing debris must also be examined in terms of the existence of a relevant right. In my view, under current international and space law, a right to remove specific space debris/objects on an *ad hoc* basis by a State other than the State of registration does not exist, except in the aforementioned exceptional circumstances of precluding wrongfulness. Therefore, for such a right to be discussed, it would first have to be established or instituted. I believe that such a right would be very difficult to accept within the international space community for obvious reasons. Instead, I suggest that, within the framework of the WG, we examine the prospect of creating an international SDR mechanism, such as a multilateral treaty or an international organisation, which, under certain conditions, could achieve the desired effectiveness at least among the states that

[1] ICJ, South West Africa, Second Phase, Judgment, I.C.J. Reports 1966, p. 6, at para. 88. However, it seems that this rule has an exception in cases of violations of *erga omnes* obligations, specifically the Genocide Convention – see ICJ, Application of the Convention on the Prevention and Punishment of the Crime of Genocide (The Gambia v. Myanmar), Preliminary Objections, Judgment, I.C.J. Reports 2022, p. 477, at para. 112, 114. The removal of space debris (at lest, unilaterally and *ad hoc*) does not yet appear to fall into this category of obligations.

would be parties to it. More broadly, I believe that the issue of space debris will either be resolved or addressed in an environment of increased multilateralism, or unfortunately remain unresolved for many years to come.

Finally, regarding the same issue—unregistered space objects—no one rules out the possibility that the "invisible" State might appear at the critical moment of removal and demand that all related actions cease—something that, in my view, will happen in the majority of cases. Hence, too, the need to establish an international, multilateral mechanism.

I also agree with the draft's position that salvage cannot provide a reliable analogue, for the reasons described in the draft, with which I concur.

Finally, the step-by-step approach described on page 16 should, in my opinion, be considered in light of my comments above. In any case, it remains crucial to me that, in any event, a unilateral, *ad hoc* removal of specific debris by a third State cannot take place beyond the exceptional circumstances described in the 2001 ILC Articles on State Responsibility, because it cannot have a sufficient legal basis. This basis cannot generally be "the protection of the space environment," since such a goal would require a broader approach and action, beyond an *ad hoc* removal. Hence the need to establish a multilateral mechanism, as I mentioned earlier.

Thank you for your attention, and I remain at your disposal to continue this discussion.

Amorgos Island, July 11, 2026

George Kyriakopoulos

Comments to the ILA Document

Working Group 2:
"Should a third party be permitted to remove others' space debris?"

Mahulena Hofmann, 13 July 2026

1. Affiliation: Please keep me as Mahulena Hofmann (German/ Czech branch). There is no Luxembourg branch of ILA.
2. The document is excellent and addresses the most important aspects of the problem, sincere congratulations!
3. I am asking myself whether something as a "presumption of consent" can be constructed, especially in case of abandoned space objects.
4. P. 9, where to place a public announcement: This part can be expanded, Article XI OST and the mechanism of informing the UN Secretary General can be used. ITU mechanism is applicable only in cases when harmful interference is caused, not in cases of a physical closeness. I can work on this.
5. P. 15: This part should be given more detail: I.e. the cancelling the protection of a frequency through MFIR takes place only in the case of non-planned systems; the cancelling is not automatic but under the discretion of the ITU Buro. It is an extreme measure and used very rarely. If accepted, I can work on this part.
6. Bibliography: Please find a mention of a book "Ownership of Satellites" where several crucial authors published their views. 4th Luxembourg Workshop on Space and Satellite Communication Law, Edited by Prof. Dr. Mahulena Hofmann, Dr. Andreas Loukakis, Nomos, 1. Edition 2017, 296 Pages.
7. Concerning the recent steps of ITU in the area of space debris remediation, please find several details which I summed up for an upcoming publication:

"The ITU has not yet any general standards on sustainability and space debris. However, a Recommendation ITU-R S.1003-2 "Environmental protection of the geostationary-satellite orbit" was adopted in 1993 with a last update in 2010: In line with Guideline 7 of the COPUOS Space Debris Mitigation Guidelines, but with higher precision, the document provided guidance on disposal orbits for satellites in the geostationary-satellite orbit: As a satellite drifting in GSO after the end of its life may block radio frequency links of active satellites, it is recommended that before complete exhaustion of its propellant, such satellite should be removed from the GSO region and subsequently remain in an orbit with a perigee no less than 200 km above the geostationary altitude. The transfer to the graveyard orbit should be carried out with particular caution in order to avoid interference with active satellites.

With the increasing attractivity of the Low Earth Orbit (LEO) and the possibility of using even the Very Low Earth Orbit (VLEO) operating between altitudes of 250-350 km, the question of protecting the environment also of the low orbits has become increasingly relevant. The deorbits and quick burns up of satellites using VLEO in the Earth's atmosphere might make VLEO a 'self-cleaning orbit'; however, such practices raise potential environmental concerns linked to the amount of metallic particles and other chemicals left from equipment and parts on reentry, with unknown possible side-effects in the Earth's atmosphere. Collision risks also still persist with oversaturation of those orbits.[1] The ITU is planning to search for possible

[1] The State of Satellite Broadband, ITU 2025.

approaches to this complex issue at the upcoming ITU World Radiocommunication Conference 2027 (WRC-27).[2]

Resolute measures in guaranteeing the sustainability of space communication are required by the Resolution 219 "Sustainability of the radio-frequency spectrum and associated satellite-orbit resources used by space services" adopted by the Plenipotentiary Conference in 2022:[3] The document instructs the Radiocommunication Assembly to perform, as a matter of urgency, necessary studies on the issue of the increasing use of radio-frequency spectrum and associated orbit resources in non-GSO orbits and the long-term sustainability of these resources, and submit the results to the subsequent world radiocommunication conference (WRC) for its consideration and any necessary action. The Resolution 218 of the same conference[4] titled "ITU's role in the implementation of the "Space2030" Agenda:[5] space as a driver of sustainable development, and its follow-up and review process" resolved to collaborate with the United Nations Office for Outer Space Affairs (UNOOSA), to the "extent practicable", in strengthening capacity-building activities for developing countries, LDCs, SIDS and LLDCs concerning the application of space law, space science and technology and raising awareness on the benefits of outer space". Furthermore, measures "avoiding duplications" of activities in this area should be avoided."

[2] The full WRC-27 agenda can be found in ITU-R Resolution 813 (WRC-23), with the complete description of agenda items in the associated Resolutions.
[3] Final Acts of the Plenipotentiary Conference, Bucharest 2022, https://www.itu.int/dms_pub/itu-s/opb/conf/S-CONF-ACTF-2022-PDF-E.pdf, p. 405. ff. (accessed 18 January 2026).
[4] *Supra note*, p. 401 ff.
[5] Resolution 76/3 on the "Space2030" Agenda: space as a driver of sustainable development, adopted by the United Nations General Assembly (UNGA) on 25 October 2021.

INTERNATIONAL LAW ASSOCIATION

Working Group 3 on Definitions

Committe on Legal Aspects of Space Debris Remediation

Internal Working Paper #01

Working Method, First-Year Phases, Legal-Source and Standards Inventory, and Preliminary Catalog of Terms

Executive Summary

A. On July 12, 2026, the group agreed on a working method, first-year phases, a preliminary legal-source and standards inventory, and a non-final catalog of terms requiring definition.

B. The immediate product should not be a published lexicon. It should be a defensible beginning: a disciplined, technically aware, and operationally useful process that can support the Committee's broader work.

C. Comments should be invited in three practical columns: (i) agreement, (ii) difficulty, and (iii) additional source. This will distinguish legal disagreement from technical, commercial, security-related, or terminological difficulty.

D. Before the August 18, 2026 Vienna meeting, the group should aim for a consolidated drafting table showing which terms are core, which belong in commentary, which require a drafting note, and which should be deferred.

E. The group should keep open whether the Committee's final product should contain a definitions article, a glossary, or both; a combined approach may ultimately be the most useful solution.

F. The definitions work should remain compatible with an iterative model: it may support a future definitions article, a glossary, or a model set of issues and headings for national implementation, without assuming that States will adopt a comprehensive model law wholesale.

I. Purpose and Procedural Posture

1. This first internal working paper has a limited and practical purpose. Working Group 3 has been asked to consider whether the Committee should provide a list of relevant definitions for its work on space debris remediation and, if so, which definitions should be included. The task is not editorial only. Definitions will shape how the Committee handles legal continuity, consent, jurisdiction, responsibility, verification, and the commercial organization of remediation missions.[1]

2. The Committee's mandate is four-year and outcome-oriented. In the first year, the Committee is to collect existing legal instruments, technological materials, governmental practice, industry developments, and political positions. The second year is to produce a report of first findings. The third year is to develop possible solutions. The fourth year is to present a resolution and an implementation-oriented manual. The definitions work should therefore support the mandate without prematurely deciding issues that belong to later stages.

3. This paper proposes a working method, a sequence of first-year phases, an initial inventory of binding instruments, legally non-binding instruments and standards, and a preliminary catalog of terms that may require definition. It is designed so that Working Group 3 can report at the Committee's Vienna working meeting, scheduled for August 18, 2026, that a structured discussion process is already under way.

II. Proposed Working Method

4. The group should proceed by successive, documented narrowing. It should first identify categories of terms whose definition would produce legal consequences. This approach reduces two risks: over-defining technical matters better left to standards or commentary, and under-defining legal terms that determine consent, authority, liability, and proof. Technical methods for space debris remediation should remain outside the definitions exercise, except where terminology must be coordinated with evolving standards and mission practice through liaison with the *International Organization for Standardization* and the *Inter-Agency Space Debris Coordination Committee.*

5. Four workstreams are suggested:

(i) The **inventory workstream** should collect relevant treaties, resolutions, principles, guidelines, standards, manuals, national laws, and programmatic documents.

(ii) The **taxonomy workstream** should identify the universe of potentially relevant concepts.

(iii) The **drafting workstream** should produce short, consequences-based definitions of core concepts.

(iv) The **validation workstream** should test each proposed definition against realistic mission scenarios as well as against doctrinal concepts in international law, notably in space law.

6. The group should use a shared document repository and a rolling drafting table. Each entry should state the proposed term, possible definition, legal source, operational source, unresolved issue,

[1] International Law Association: Proposal for an ILA Committee on Space Law: Legal Aspects of Space Debris Remediation (January 2025), Summary of Work Programme and Statement of the Problem.

and drafting note. Where a term is used in the existing space treaties but not defined, the table should say so expressly. This will help the Committee distinguish treaty interpretation from new normative choice.

7. Drafting discipline matters. This internal paper should remain within Working Group 3 until the members have discussed and agreed on the wording. Once a consolidated version is agreed, it can be presented to the Committee as a working basis, not as a final recommendation.

8. Before any submission to the full Committee, the consolidated text should be shared with the other working groups for targeted feedback, so that terminology used in or developed by Working Group 3 does not diverge from the Committee's work on legal problems, commercialization, incentives, or implementation.

III. First Mandate-Year Phases

9. The first phase should be mapping. The group should identify binding treaty terms, non-binding legal instruments, technical standards, and operational materials that already influence vocabulary in debris mitigation, remediation, rendezvous and proximity operations, and on-orbit servicing. The second phase should be classification. The group should distinguish terms that are legally operative from terms that are technical, evidentiary, commercial, or descriptive. The third phase should be drafting. The group should begin with a limited number of core terms. The fourth phase should be validation. Each draft definition should be tested against practical scenarios, including removal of a registered derelict satellite, inspection of an unidentified object, controlled re-entry, and mission failure as well as against doctrinal concepts in international law, notably in space law.[2]

10. The first August 18, 2026 objective should be modest but tangible. The group should explain its method, present its initial inventory, identify definitional clusters, and show an initial catalog. It should not claim premature consensus on sensitive concepts such as deemed consent, emergency removal, or the relationship between "space debris remediation" and "active debris removal" or between "space object" and "space debris." The August 18 target should be understood as ambitious but useful; the purpose is to enable informed Committee discussion, not to freeze the Group's final vocabulary.

IV. Initial Inventory of Binding and Non-binding Instruments, Standards, and Texts

11. The inventory should begin with binding space law [*see* subsection (i) *infra*]. Its distinctive value, however, will lie in mapping the non-binding instruments that already shape State practice, licensing expectations, and industry standards. It should therefore include, at a minimum, the documents and standards listed in subsection (ii) *infra.* In addition, the inventory should contain a selective national-law appendix covering major and representative spacefaring jurisdictions; that appendix

[2] *See* the Annex for a tentative working structure of the first-year phases.

should serve as comparative material for definitional choices, not as an attempt to harmonize national law [*see* subsection (iii) *infra*].

(i) Binding Instruments and Authoritative Statements of Customary International Law

[01] United Nations General Assembly Resolution 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, 13 December 1963[3]

[02] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 27 January 1967[4]

[03] Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 22 April 1968[5]

[04] Convention on International Liability for Damage Caused by Space Objects, 29 March 1972[6]

[05] Convention on Registration of Objects Launched into Outer Space, 14 January 1975[7]

[06] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 18 December 1979[8]

[07] International Institute for the Unification of Private Law (UNIDROIT), Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets, Berlin, 9 March 2012 (not in force)[9]

(ii) Non-binding Instruments, Standards, and Texts

[08] Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes, 13 October 2020[10]

[09] Cologne Commentary on Space Law, Volumes I–III (as authoritative law commentary rather than as an instrument to be treated on the same footing as treaties, resolutions, or technical standards)[11]

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[3] https://digitallibrary.un.org/record/203965/files/A_RES_1962%28XVIII%29-EN.pdf. – Although the resolution is not binding as such, it is widely regarded as an authoritative statement of the foundational principles of international space law. To the extent that those principles are reflected in the treaties under [02], [03], [04], [05] or [06] and supported by subsequent State practice and *opinio juris,* they may properly be treated as expressing customary international law.

[4] 610 U.N.T.S. 205; https://treaties.un.org/doc/Publication/UNTS/Volume%20610/volume-610-I-8843-English.pdf

[5] 672 U.N.T.S. 119; https://treaties.un.org/doc/Publication/UNTS/Volume%20672/volume-672-I-9574-English.pdf

[6] 961 U.N.T.S. 187; https://treaties.un.org/doc/Publication/UNTS/Volume%20961/volume-961-I-13810-English.pdf

[7] 1023 U.N.T.S. 15; https://treaties.un.org/doc/Publication/UNTS/Volume%201023/v1023.pdf

[8] 1363 U.N.T.S. 21; https://treaties.un.org/doc/Publication/UNTS/Volume%201363/volume-1363-I-23002-English.pdf

[9] Especially Article I(2)(j) ("space") and Article I(2)(k) ("space asset"); https://www.unidroit.org/instruments/security-interests/space-protocol/

[10] https://www.nasa.gov/wp-content/uploads/2022/11/Artemis-Accords-signed-13Oct2020.pdf?emrc=6a460b7c71650

[11] Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, Gérardine Meishan Goh (eds.), Cologne Commentary on Space Law Volume I: Outer Space Treaty (Cologne: Carl Heymanns Verlag, 2009); Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl and Peter Stubbe (eds.), Cologne Commentary on Space Law. Volume II: Rescue Agreement, Liability Convention, Registration Convention, Moon Agreement (Cologne: Carl Heymanns Verlag 2013); Stephan Hobe,

[10] Committee on the Peaceful Uses of Outer Space, Guidelines for the Long-term Sustainability of Outer Space Activities, 2019[12]

[11] Committee on the Peaceful Uses of Outer Space, Report of the Scientific and Technical Subcommittee on the Work of Its Thirty-Second Session, 24 February 1995[13]

[12] Committee on the Peaceful Uses of Outer Space, Report of the Scientific and Technical Subcommittee on the Work of Its Thirty-Fourth Session, 10 March 1997[14]

[13] Consortium for Execution of Rendezvous and Servicing Operations, Guiding Principles for Commercial Rendezvous and Proximity Operations (RPO) and On-Orbit Servicing (OOS)[15]

[14] Consortium for Execution of Rendezvous and Servicing Operations, CONFERS Recommended Design and Operational Practices[16]

[15] Consortium for Execution of Rendezvous and Servicing Operations, CONFERS Lexicon of Terms and Definitions[17]

[16] European Code of Conduct for Space Debris Mitigation, 28 June 2004, Issue 1.0[18]

[17] European Cooperation for Space Standardization, ECSS-U-AS-10C Rev. 2, Adoption Notice of ISO 24113 "Space systems — Space debris mitigation requirements," February 9, 2024[19]

[18] European Space Agency, ESA Space Debris Mitigation Requirements, ESSB-ST-U-007, Issue 1 Revision 1, October 23, 2025[20]

[19] European Space Agency, ESA's Annual Space Environment Reports (since 2017, especially the evolution of the definition of space debris in the 2017 and 2018 reports)[21]

[20] European Space Agency, Statement for a Responsible Space Sector, 21 November 2022[22]

[21] European Space Agency, Zero Debris Charter: Towards a Safe and Sustainable Space Environment[23]

[22] European Space Agency, Zero Debris Technical Booklet[24]

[23] European Union, Draft International Code of Conduct for Outer Space Activities, 31 March 2014[25]

Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, Peter Stubbe (eds.), Cologne Commentary on Space Law. Volume III: UNGA Resolutions (Cologne: Carl Heymanns Verlag, 2015); https://research.wolterskluwer-online.de/document/332c7692-90c8-36b9-9648-15aba96bd4aa (requires subscription)

[12] U.N. Doc. A/74/20, Annex II; https://www.unoosa.org/documents/pdf/PromotingSpaceSustainability/Publication_Final_English_June2021.pdf

[13] U.N. Doc. A/AC.105/605, para. 95; https://www.unoosa.org/pdf/reports/ac105/AC105_605E.pdf

[14] U.N. Doc. A/AC.105/672, para. 112; https://www.unoosa.org/pdf/reports/ac105/AC105_672E.pdf

[15] https://cdn.ymaws.com/satelliteconfers.org/resource/resmgr/confers_publications/confers-guiding-principles_r.pdf

[16] https://cdn.ymaws.com/satelliteconfers.org/resource/resmgr/confers_publications/confers_operating_practices_.pdf

[17] https://cdn.ymaws.com/satelliteconfers.org/resource/resmgr/pdfs/confers_lexicon_paper-202423.pdf

[18] https://www.unoosa.org/documents/pdf/spacelaw/sd/European_code_of_conduct_for_space_debris_mitigation.pdf

[19] https://ecss.nl/standard/ecss-u-as-10c-rev-2-adoption-notice-of-iso-24113-space-systems-space-debris-mitigation-requirements-9-february-2024/

[20] https://sdup.esoc.esa.int/documents/download/ESSB-ST-U-007_Issue_1_Revision_1_23_October_2025.pdf

[21] https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2025

[22] https://www.responsiblespacesector.com/_files/ugd/ec5056_4352baf8c13345b3b2fc7bee12afc9d9.pdf

[23] https://esoc.esa.int/sites/default/files/Zero_Debris_Charter_EN.pdf

[24] https://esamultimedia.esa.int/docs/spacesafety/Zero_Debris_Technical_Booklet.pdf

[25] https://www.eeas.europa.eu/sites/default/files/space_code_conduct_draft_vers_31-march-2014_en.pdf

[24] European Union, Proposal for a Regulation of the European Parliament and of the Council on the safety, resilience and sustainability of space activities in the Union (EU Space Act), 25 June 2025[26]

[25] European Union, Proposal for a Regulation of the European Parliament and of the Council on the safety, resilience and sustainability of space activities in the Union (EU Space Act, Presidency Compromise Text), 2025/0335 (COD), Annex, 30 March 2026[27]

[26] European Union, Regulation (EU) 2021/696 of the European Parliament and of the Council of 28 April 2021 establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU[28]

[27] Global Expert Group on Sustainable Lunar Action, Recommended Framework and Key Elements for Peaceful and Sustainable Lunar Activities[29]

[28] Inter-Agency Space Debris Coordination Committee, IADC Space Debris Mitigation Guidelines, IADC-02-01, Revision 4, 16 January 2025[30]

[29] International Academy of Astronautics, Position Paper on Orbital Debris, Updated edition, September 2001[31]

[30] International Law Association, International Instrument on the Protection of the Environment from Damage Caused by Space Debris, Final Report to the Sixty-sixth Conference, Buenos Aires, 1994[32]

[31] International Organization for Standardization, ISO 24113:2023, Space systems — Space debris mitigation requirements[33]

[32] International Organization for Standardization, ISO 24330:2022, Space systems — Rendezvous and Proximity Operations (RPO) and On Orbit Servicing (OOS) — Programmatic principles and practices[34]

[33] International Telecommunication Union, Recommendation ITU-R S.1003-2, Environmental protection of the geostationary-satellite orbit, 12/2010, Annex 1[35]

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[26] Doc. COM/2025/335 final; https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52025PC0335

[27] https://data.consilium.europa.eu/doc/document/ST-7806-2026-INIT/en/pdf

[28] Doc. PE/21/2021/INIT. OJ L 170, 12.5.2021; https://eur-lex.europa.eu/eli/reg/2021/696/oj/eng

[29] Global Expert Group on Sustainable Lunar Activities, Recommended Framework and Key Elements for Peaceful and Sustainable Lunar Activities (2022), https://moonvillageassociation.org/gegsla/documents/gegsla-recommended-framework/#

[30] https://www.iadc-home.org/documents_public/file_down/id/5836

[31] https://conference.sdo.esoc.esa.int/proceedings/sdc3/paper/7/SDC3-paper7.pdf

[32] "International Instrument on the Protection of the Environment from Damage Caused by Space Debris," Final Report to the Sixty-sixth Conference, Buenos Aires, 1994, at pages 317–321. – *See also* Permanent Observer of the International Law Association: Proposal to the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space: Review of Existing Norms of International Law Applicable to Space Debris, U.N. Doc. A/AC.105/C.2/L.231 (29 January 2002), https://digitallibrary.un.org/record/461118/files/A_AC.105_C.2_L.231-EN.pdf.

[33] https://www.iso.org/standard/83494.html

[34] https://www.iso.org/standard/78463.html

[35] https://www.unoosa.org/documents/pdf/spacelaw/sd/R-REC-S1003-2-201012-IPDF-E.pdf

[34] Space Security Lexicon (as a security-vocabulary reference tool for terminology that overlaps with security-related remediation questions)[36]

[35] Space Sustainability Rating Association, The Rating[37]

[36] The Hague International Space Resources Governance Working Group, Building Blocks for the Development of an International Framework for the Governance of Space Resource Activities[38]

[37] The McGill Manual on International Law Applicable to Military Uses of Outer Space, Volume I: Rules[39]

[38] The Woomera Manual on the International Law of Military Space Operations[40]

[39] United Nations Committee on the Peaceful Uses of Outer Space, Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, 2010[41]

[40] United Nations General Assembly Resolution 59/115, Application of the concept of the "launching State"[42]

[41] United Nations General Assembly Resolution 62/101, Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects[43]

[42] United Nations General Assembly Resolution 68/74, Recommendations on national legislation relevant to the peaceful exploration and use of outer space[44]

[43] United Nations General Assembly Resolution 77/41, Destructive direct-ascent anti-satellite missile testing[45]

[44] United Nations General Assembly Resolution 79/1, The Pact for the Future[46]

[45] United Nations Secretary-General, Our Common Agenda Policy Brief 7: For All Humanity – the Future of Outer Space Governance, May 2023[47]

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[36] Almudena Azcárate Ortega and Victoria Samson (eds.), A Lexicon for Outer Space Security (Geneva: United Nations Institute for Disarmament Research and Secure World Foundation, 2023), https://doi.org/10.37559/WMD/23/Space/05

[37] Space Sustainability Rating Association, The Rating, https://spacesustainabilityrating.org/the-rating/, including its publicly available methodology and associated implementation materials. – *See also* Francesca Letizia, Stijn Lemmens, Danielle Wood, Moriba Jah, Miles Lifson, Richard Steindl, Ariel Ekblaw, Kazuto Suzuki and Nikolai Khlystov, Paper No 95 "Framework for the Space Sustainability Rating," Proceedings of the 8th European Conference on Space Debris, ESA Space Operations Centre, Darmstadt, 20–23 April 2021, https://conference.sdo.esoc.esa.int/proceedings/sdc8/paper/95/SDC8-paper95.pdf.

[38] The Hague International Space Resources Governance Working Group, Building Blocks for the Development of an International Framework on Space Resource Activities, adopted 12 November 2019, https://www.unoosa.org/documents/pdf/copuos/lsc/space-resources/DraftPrinciplesContributions/LU_NL_Joint_Submission_20241115_FINAL.pdf

[39] https://www.mcgill.ca/milamos/sites/milamos/files/mcgill_manual_volume_i_-_rules_final_0.pdf

[40] https://academic.oup.com/oxford-law-pro/book/57847.

[41] ST/SPACE/49; https://www.unoosa.org/pdf/publications/st_space_49E.pdf

[42] https://www.unoosa.org/pdf/gares/ARES_59_115E.pdf

[43] https://www.unoosa.org/pdf/gares/ARES_62_101E.pdf

[44] https://www.unoosa.org/pdf/gares/A_RES_68_074E.pdf

[45] https://docs.un.org/en/A/res/77/41

[46] https://docs.un.org/en/a/res/79/1

[47] https://www.un.org/sites/un2.un.org/files/our-common-agenda-policy-brief-outer-space-en.pdf

[46] United Nations Secretary-General, Reducing space threats through norms, rules and principles of responsible behaviours, Report of the Secretary-General, 13 July 2021[48]

[47] World Economic Forum, European Space Agency, Space Industry Debris Mitigation Recommendations. Future of Space Network — Sustainable Space Initiative, Centre for the Fourth Industrial Revolution, June 2023[49]

(iii) Selective National Legislation

The group recognizes that the United Nations Office for Outer Space Affairs (UNOOSA) has published, and continues to update, a comprehensive collection of national laws and regulations relating to the exploration and use of outer space, as submitted by States.[50] For the purposes of this subsection, however, the national-law overview is more selective: it identifies, as comparative material, *selected* national instruments that translate space-debris mitigation, end-of-life disposal, remediation-adjacent activity, or launch-related debris management into authorization, licensing, registration, or technical-standard mechanisms:

[48] Australia

Legal sources: Space (Launches and Returns) Act 2018 (current citation of Act No. 123 of 1998 as renamed and amended, with the 2018 amendments commencing 31 August 2019);[51] Space (Launches and Returns) (General) Rules 2019 (made 29 August 2019).[52]

Brief explanatory note: Applications for Australian launch permits and overseas payload permits must include debris-mitigation strategies; Rules sections 54 and 79 require those strategies to be based on an internationally recognized guideline or standard, describe orbital-debris-mitigation measures, and include an orbital-debris assessment.

[49] China

Legal sources: Interim Measures on Space Debris Mitigation and Protection Management, issued in 2009,[53] and GB/T 34513-2017, Space Debris Mitigation Requirements (issued 1 November 2017; implemented 1 May 2018),[54] together with related national technical standards.[55]

Brief explanatory note: Management measures for spacecraft development and operation are complemented by standards adopting or aligning with ISO debris-mitigation requirements, including launch-vehicle operational-debris mitigation, pre-launch debris-mitigation review, col-

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[48] U.N. Secretary-General, Reducing Space Threats Through Norms, Rules and Principles of Responsible Behaviours, U.N. Doc. A/76/77 (13 July 2021), https://digitallibrary.un.org/record/3952870/files/A_RES_76_231-EN.pdf

[49] https://www3.weforum.org/docs/WEF_Space_Industry_Debris_Mitigation_Recommendations_2023.pdf

[50] https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/index.html. – For the UNOOSA National Space Law and Policy Database on its Accessing Space Treaty Resources Online (ASTRO) portal *see* https://astro.unoosa.org/astro/en/index.html.

[51] https://www.legislation.gov.au/C2004A00391/latest/text

[52] https://www.legislation.gov.au/F2019L01118/latest/text

[53] Interim Measures for Space Debris Mitigation and Protection Management [空间碎片减缓与防护管理暂行办法]; https://vienna.china-mission.gov.cn/hplywk/201304/t20130422_8867301.htm

[54] Space Debris Mitigation Requirements [空间碎片减缓要求]; https://www.cnsa.gov.cn/english/n6465684/n6465689/index.html

[55] https://openstd.samr.gov.cn/bzgk/std/newGbInfo?hcno=0659F98ADD34DB0A751B9221F4785CA6

lision-warning technical requirements, terminology, environmental models, and on-orbit-removal guidance.

[50] Denmark

Legal sources: Outer Space Act, Act No. 409 of 11 May 2016 (activities in outer space),[56] and Executive Order No. 552 of 31 May 2016[57] on requirements in connection with approval of activities in outer space.

Brief explanatory note: Relevant provisions: approval requires appropriate measures with regard to space-debris management; section 6 of the Executive Order permits requirements that activities meet relevant standards and guidelines for space-debris management, including ECSS or ISO standards, and contains a 25-year end-of-life disposal rule; section 7 addresses environmental impacts in outer space.

[51] France

Legal sources: Law No. 2008-518 of 3 June 2008 on Space Operations (Loi n° 2008-518 du 3 juin 2008 relative aux opérations spatiales),[58] together with the Technical Regulation of 31 March 2011 as amended, including Article 40-2 inserted in 2024.[59]

Brief explanatory note: Authorizations may include prescriptions to limit risks linked to space debris; "space debris" is defined; the technical regulation requires limitation of debris during nominal operations, passivation, collision-risk prevention, end-of-life disposal from protected regions, and design measures facilitating later active debris removal.

[52] India

Legal sources: No comprehensive enacted space act specifically addressing space debris was identified. The relevant national instruments are regulatory and policy instruments: the Indian Space Policy 2023[60] and the IN-SPACe Norms, Guidelines and Procedures for Implementation of Indian Space Policy 2023 in respect of Authorization of Space Activities (3 May 2024),[61] together with the Debris-Free Space Missions initiative announced in 2024 for all Indian space actors by 2030.[62]

Brief explanatory note: Authorization of nongovernmental space activities, authorization materials for space-situational-awareness activities, and policy commitments to debris-free missions through design and execution of mitigation guidelines.

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[56] https://ufm.dk/media/xragv1p5/outer-space-act.pdf

[57] https://ufm.dk/media/tqhpnskw/executive-order-on-requirements-in-connection-with-approval-of-activities-in-outer-space-etc-_final.pdf

[58] https://www.legifrance.gouv.fr/loda/id/JORFTEXT000018931380/?__cf_chl_f_tk=dU4s5eIUUEH-RfIaZMgR0UEEWbQ4I.GzBAUO3vTuDKBw-1783249077-1.0.1.1-ZU1fq18ECb5Er6Rd7FuW_f4ensfvZU2Nz_oMzxP5DkQ

[59] https://www.legifrance.gouv.fr/loda/id/JORFTEXT000024095828/

[60] https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf

[61] https://www.inspace.gov.in/sys_attachment.do?sys_id=5d532e37877102503b0f0d060cbb35cf; https://www.in-space.gov.in/inspace/sys_attachment.do?sys_id=bb786ff33b6d0b1063ff0a34c3e45ab5

[62] https://www.isro.gov.in/Debris_Free_Space_Missions.html

[53] Italy

Legal sources: Law No. 89 of 13 June 2025, Provisions on the Space Economy (Legge 13 giugno 2025, n. 89, Disposizioni in materia di economia dello spazio).[63]

Brief explanatory note: Article 2(a) includes launch, release, in-orbit management, re-entry, disposal from Earth orbits, removal of objects, and in-orbit services within "space activity"; Article 5(1)(a) requires technical suitability standards addressing light and radio pollution and mitigation of the effects of space debris, including safe and, where possible, controlled atmospheric re-entry; Article 5(1)(c) addresses environmental sustainability over the life cycle.[64]

[54] Japan

Legal sources: Act on Launching Spacecraft and Launch Vehicle and Control of Spacecraft, Act No. 76 of 2016 (16 November 2016),[65] together with Cabinet Office licensing guidelines,[66] and JAXA Space Debris Mitigation Standard JMR-003E (27 April 2023).[67]

Brief explanatory note: Article 22 requires licensed spacecraft control to meet standards preventing harmful contamination and interference, including collision avoidance, termination measures, safe re-entry or graveyard disposal, and passivation where disposal cannot otherwise be implemented; the on-orbit-servicing guideline defines space debris, on-orbit servicing, and active debris removal.

[55] Kazakhstan

Legal sources: Law of the Republic of Kazakhstan No. 528-IV "On Space Activities" of 6 January 2012,[68] and Government Decree No. 838 of 26 June 2012 approving the Rules for coordination and decision-making on launches of space objects, as amended.[69]

Brief explanatory note: The statutory framework regulates space activities, space objects, and utilization of space technology; the launch-approval rules define "space object" to include spacecraft, launch means, and their components and require pre-launch governmental coordination for launches by Kazakhstani participants. These materials are most relevant to launch-related debris and fall-zone management rather than to a full orbital-debris-mitigation regime.

[56] Norway

Legal sources: Act relating to activities in outer space (the Space Act), Act No. 128 of 22 December 2025, replacing the earlier Act No. 38 of 13 June 1969 on launching objects from Norwegian territory into outer space.[70]

Brief explanatory note: The new Act establishes authorization and supervision for Norwegian space activities and, according to Norway's space-traffic-management submission, takes into

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[63] https://www.gazzettaufficiale.it/eli/id/2025/06/24/25G00095/SG

[64] https://www.doctrine.it/norms/laws/itatextot3ejzg81vs36/articles/itaart3fsrk7jdzdvj41j

[65] https://www.japaneselawtranslation.go.jp/en/laws/view/4813/en

[66] https://www8.cao.go.jp/space/english/activity/documents/guideline_oosgl.pdf

[67] https://sma.jaxa.jp/TechDoc/Docs/E_JAXA-JMR-003E.pdf

[68] https://www.unoosa.org/documents/pdf/spacelaw/national/kazakhstan/528-IV_2012-01-06E.pdf; https://adilet.zan.kz/eng/docs/Z1200000528

[69] https://zakon.uchet.kz/eng/docs/P1200000838

[70] https://lovdata.no/dokument/NLE/lov/2025-12-22-128/KAPITTEL_8#%C2%A729

account the need to limit space debris; implementing regulations should be monitored for detailed definitions and operator duties.

[57] Pakistan

Legal sources: Pakistan Space Activities Rules 2024, promulgated by the Federal Government on 2 February 2024.[71]

Brief explanatory note: The Rules establish the Pakistan Space Activities Regulatory Board and require authorization and regulation of outer-space and upper-atmosphere activities; the application materials refer to the Guidelines for the Long-term Sustainability of Outer Space Activities and the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space.

[58] Portugal

Legal sources: Decree-Law No. 16/2019 of 22 January 2019 establishing the regime of access to and exercise of space activities,[72] as amended by Decree-Law No. 20/2024 of 2 February 2024,[73] and Regulation No. 697/2019 of 5 September 2019,[74] as amended by Regulation No. 1206-A/2024 of 21 October 2024.[75]

Brief explanatory note: Licensing and registration materials require information on space-debris mitigation, incidents and anomalies, end-of-life data, and space debris in orbit caused by the space object.

[59] Russian Federation

Legal sources: Law of the Russian Federation No. 5663-I "On Space Activities" of 20 August 1993;[76] Federal Law No. 215-FZ "On the State Corporation for Space Activities Roscosmos" of 13 July 2015;[77] and National Standard GOST R 52925-2018 "Space Technology Items General Requirements on Space Systems for the Mitigation of Human-Produced Near-Earth Space Pollution" (approved 21 September 2018; effective 1 January 2019).[78]

Brief explanatory note: Article 22 of the 1993 Law requires due regard to permissible anthropogenic burden on the environment and near-Earth space; the Roscosmos law assigns work to reduce pollution of near-Earth space; GOST R 52925-2018 contains technical debris-mitigation requirements over the spacecraft life cycle, including passivation and disposal.

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[71] https://psarb.gov.pk/assets/client/pdf/6943-23-Ex-II-National%20Command%20Authority.pdf

[72] https://ptspace.pt/wp-content/uploads/2020/05/lei-do-espaco.pdf

[73] https://www.anacom.pt/render.jsp?contentId=1773528

[74] https://www.anacom.pt/render.jsp?contentId=1496233

[75] https://www.anacom.pt/render.jsp?contentId=1802981

[76] https://faolex.fao.org/docs/pdf/rus68717.pdf

[77] https://faolex.fao.org/docs/pdf/rus233794.pdf

[78] The download of the National Standard of the Russian Federation GOST R 52925-2008 "SPACE TECHNOLOGY ITEMS. General Requirements on Space Systems for the Mitigation of Human-Produced Near-Earth Space Pollution" is a charged service. An electronical copy of this standard in the Russian language can be made available upon request to the members of the ILA Committee on Legal Aspects of Space Debris Remediation. The standard is explained by S. Loginov, M. Yakovlev, M. Mikhailov and L. Popkova in their Paper No. 62 "National Standard of the Russian Federation for Space Debris Mitigation," Proceedings of the 5th European Conference on Space Debris, ESA Space Operations Centre, Darmstadt, 30 March–2 April 2009, https://conference.sdo.esoc.esa.int/proceedings/sdc5/paper/62/SDC5-paper62.pdf.

[60] United Kingdom

Legal sources: Outer Space Act 1986 (18 July 1986),[79] Space Industry Act 2018 (15 March 2018),[80] and Space Industry Regulations 2021 (S.I. 2021/792, made 12 July 2021).[81]

Brief explanatory note: Licensing may impose safety and international-obligation conditions; regulation 101 requires an orbital operator to prevent contamination of outer space, avoid the release of space debris, avoid collisions, prevent break-up, and dispose of the space object at end of life; Schedule 1 requires an orbital-debris-mitigation statement describing engineering, design, and operational measures.[82]

[61] United States

Legal sources: Code of Federal Regulations, Title 47, Part 25, §§ 25.114(d)(14),[83] 25.283,[84] as amended by the Federal Communications Commission's orbital-debris rulemakings, including FCC 22-74 (adopted 29 September 2022), and Code of Federal Regulations, Title 14, Part 450, § 450.171.[85]

Brief explanatory note: Orbital-debris-mitigation disclosures for satellite licensing, trackability, proximity operations, disposal planning, geostationary graveyard disposal, low-Earth-orbit post-mission disposal within five years, passivation, and launch-vehicle end-of-launch debris controls.

12. These instruments should not be treated as equivalent. United Nations resolutions and COPUOS guidelines supply political and legal orientation; IADC, ISO, ECSS, ESA, and CONFERS materials translate risk into operational practice; military-space manuals may help where security vocabulary overlaps with remediation. Technical standards should inform legal definitions, but they should not replace them. The Committee's vocabulary must remain intelligible to legislators, regulators, operators, insurers, investors, and courts.

V. Proposed Clusters of Concepts Requiring Legal Definition

13. The catalog should be built from legal function, not from terminology alone. A definition is useful when it affects authority, consent, jurisdiction, responsibility, licensing, liability, evidence, or commercial implementation.

14. The first cluster consists of **treaty-anchored legal-status terms**. These terms determine who is responsible, who may authorize, who retains jurisdiction and control, and which State may need to be notified or consulted. The term "space object" is especially important because debris may be better

[79] https://www.legislation.gov.uk/ukpga/1986/38/contents

[80] https://www.legislation.gov.uk/ukpga/2018/5/contents

[81] https://www.legislation.gov.uk/uksi/2021/792/regulation/101

[82] https://www.legislation.gov.uk/uksi/2021/792/schedule/1

[83] https://www.ecfr.gov/current/title-47/chapter-I/subchapter-B/part-25/subpart-B/subject-group-ECFRe2bd70fc6b2eea0/section-25.114

[84] https://www.ecfr.gov/current/title-47/chapter-I/subchapter-B/part-25/subpart-D/section-25.283

[85] https://www.ecfr.gov/current/title-14/chapter-III/subchapter-C/part-450/subpart-C/section-450.171

understood as a regulatory subcategory of space object rather than as a legally detached category.[86] At the same time, the definition should make clear that "space debris" and "space object" are not synonyms: debris may remain a space object for purposes of jurisdiction, control, registration, and liability, while serving as a distinct regulatory category for remediation, prioritization, and evidentiary assessment.

15. The second cluster consists of **debris-specific terms**. The point is not taxonomy for its own sake. The point is to identify terms that influence consent pathways, notification duties, prioritization, and evidentiary burdens. The group should decide which debris categories are legally necessary and which should be left to commentary.[87]

16. The third cluster consists of **remediation and mission terms**. This is the bridge between law and operations. The group should decide whether "space debris remediation" is the umbrella term and "active debris removal" one modality, or whether the Committee will use the terms interchangeably. The distinction matters because some missions inspect, stabilize, passivate, move, or service objects without permanently removing them from an orbital region.[88]

17. The fourth cluster consists of **authorization, consent, and responsibility terms**. These are the most legally sensitive concepts. They should be drafted only after the group distinguishes neutral definitions from policy choices. In particular, concepts such as "deemed consent" or "emergency intervention" should not be defined in a way that implies Committee approval before the Committee has considered the underlying policy question.[89]

18. The fifth cluster consists of **commercial, evidentiary, and implementation terms**. These terms may not all belong in a formal definitions article, but they matter if the Committee wants its work to be usable by national legislators, licensing authorities, public agencies, insurers, investors, and contracting parties. They also connect definitions to proof of performance and market design.[90]

VI. Drafting Principles

19. Five drafting principles are proposed. First, define only what has legal consequences. Second, avoid technical thresholds that may quickly become obsolete. Third, preserve treaty continuity, espe-

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[86] Proposed treaty-status terms for the first drafting table: appropriate State; component part; launch; launch vehicle; launching Authority; launching State; operator; outer space; owner of a space object; re-entry; space activities; space object; State of registry.

[87] Proposed debris-specific terms for the first drafting table: debris of indeterminate registry; high-risk debris; identified debris; legacy debris; mission-related debris; priority debris; space debris; space debris mitigation; technically remediable debris; unidentified debris.

[88] Proposed remediation and mission terms for the first drafting table: active debris removal; capture; deorbiting; controlled re-entry; graveyard orbit; inspection; on-orbit servicing; passivation; post-mission disposal; rendezvous and proximity operations; reorbiting; space debris remediation; towing; uncontrolled re-entry; verified removal.

[89] Proposed authorization, consent, and responsibility terms for the first drafting table: authorization; consent; consultation; continuing supervision; deemed consent; due diligence; due regard; emergency intervention; fault; liability allocation; mission-specific consent; notification; standard of care; standing consent.

[90] Proposed commercial and evidentiary terms for the first drafting table: anchor customer; data escrow; design for remediation; financial assurance; independent verification; licensed remediation operator; performance milestone; proof of performance; protected technical information; regulatory sandbox; remediation credit; remediation service; safety-critical data.

cially for “space object,” “launching State,” and “State of registry.” Fourth, separate legal definitions from evidentiary criteria—that is, from the data, documentation, or verification steps needed to show that a definition is satisfied in a specific mission. Fifth, allow technical standards to inform the commentary without being incorporated wholesale unless the legal effect is clear.

20. A three-layer structure is likely to be useful: (i) a short definitions provision for legally operative terms, (ii) an explanatory commentary for interpretation, and (iii) a glossary for technical and operational vocabulary. This structure would keep the operative text stable while allowing the Committee to use technical materials without overburdening the legal instrument. It would also support the Committee’s mandate to produce guidance that can be implemented by international and national legislators without unnecessary constraints.

VII. Expected Product for August 18, 2026

21. By the Vienna meeting, the group should aim to present a consolidated drafting table rather than a finished lexicon. The table should identify core terms, commentary terms, terms requiring further analysis, and terms to be deferred. This will show that the group has begun a structured process and will give the Committee a stable vocabulary for later work on consent, licensing, responsibility, liability, commercialization, and proof of performance. Because the definitions work is foundational for the other working groups, even a provisional table should be circulated early enough to permit meaningful comment, with any unresolved concepts clearly flagged.

22. The most useful immediate result would be a shared understanding of method. If the group can agree on the inventory, the clusters, and the criteria for selecting core definitions, it will have done enough for the first stage. The next step can then be the drafting of concise definitions for a limited number of priority terms, beginning with those most likely to influence the Committee’s treatment of consent, jurisdiction, authorization, responsibility, and verification.

Dirk Roland Haupt Theuns Kotzé Rada Popova Marie-Clotilde Runavot Gábor Sulyok

Annex

Tentative working structure of the first-year phases

Phase	Period	Main deliverable
1. Orientation and inventory	June–July 2026	Internal inventory of instruments, guidelines, standards, and doctrinal sources; preliminary list of terms.
2. Taxonomy and selection	July–September 2026	Shortlist of terms requiring definition; identification of treaty terms used without definition; first Vienna briefing.
3. Drafting of core definitions	September–December 2026	Draft definitions of legally operative terms; notes on disputed concepts and alternative formulations.
4. Scenario-testing and refinement	January–March 2027	Testing against consent, licensing, ownership, registration, liability, and verification scenarios.
5. Consolidation for Committee report	Spring 2027	Working Group 3 contribution to the Committee's first-year or second-year reporting process.

Gmail

Rada Popova <rada.popova@gmail.com>

Fwd: Shared file for brainstorming (provisional)

Katja Grunfeld <katja.grunfeld@gmail.com> 26 July 2026 at 12:11
To: Rada Popova <rada.popova@gmail.com>

Liebe Rada,

Anbei der Text von unserer Gruppe.

Liebe Grüße
Katja

ILA Committee on Legal Aspects of Space Debris Remediation

Working Group 4 on Economic and Non-Economic Incentives

Task

Working group 4 was tasked with exploring the question: "How can (economic and non-economic) incentives for space debris remediation be created, including through rules that encourage the commercialization of remediation activities?". This is a broad question that can be taken in many different directions. The idea of this document is to prove the broader committee a starting point for the discussion of such incentives and their inclusion (or non-inclusion) within the ultimate outcome document.

Process

The working group chose to work through a shared document where the group members were able to provide their input on this question. Subsequently, this input was consolidated into this document. Unfortunately, the working group did not manage to meet online to have a discussion on the various incentives proposed nor on the question of inclusion of economic and non-economic incentives within the final outcome document of the committee.

Outcome

Setting out from the aforementioned question, we chose to split the incentives along the economic / non-economic line. Working group members offered both novel ideas and ideas based on analogies to other areas of international law.

Economic incentives

The economic incentives suggested below naturally centre on financial mechanisms that either encourage various links (launcher, builder, operator, etc.) in the satellite services chain to undertake debris remediation or bolster actors that seek to undertake active debris remediation activities.

> Encourage that licences include a mandatory debris remediation bond. Essentially, this entails that operators will have to pay a certain fee before launch, but that this fee can will be refunded based on achieving certain results: (1) disposal through successful de-orbiting or (2) disposal through active

debris removal. For example, this option is being explored in China as a form of security deposit to encourage de-orbiting and safe re-entry. Alternatively, the choice can be made to provide tax breaks or waive licence fees when operators already demonstrate de-orbit plans or disposal through ADR plans before the launch. (Tax breaks can be provided for operators that are developing, testing, and operationalising such technology.) The former might be preferred as it would provide a stronger incentive for the operator to follow through on its plans (but might also have negative effects on smaller operators).

Another financial incentive could be to subsidise the launch costs for ADR activities. This incentive is quite fraught, however, as it essentially entails the industrial policy of states.

Mirroring the incentives under the Paris Agreement, a market-based incentive could be set up. First, this could include debris removal off-set credits. For example, an operator that pays for the removal of debris (which will require a way to measure the quantity of debris removed), would gain credits that could be used to off-set their own activities that generate space debris. Naturally, this would also require agreement on limiting activities that generate space debris.

A financial mechanism that could exist separately or at the same time as one or all of the previous incentives, is establishing an international fund. Here, all operators would pay into the fund whenever they launch an object into outer space (or alternatively, whenever they launch into already crowded orbits, which would incentivise technological development to use other orbits as well). The fund would then be used to pay for ADR activities. The international fund could be introduced in phases beginning with national or regional funds before transitioning to global funds, and would require payment for all activities beginning from the point of fund introduction (no retroactivity). Different financing models have furthermore been proposed, e.g., similar to XPRIZE Foundation, where space object operators pay fees proportional to their share of global space activity. Further differentiations could be applied depending on level of economic development , target orbit, crewed or uncrewed, mass ob objects and altitude, commercial and non-commercial actor, level of mitigation or ADR compliance etc.(for an analysis see Hobe, Perspectives for Space Law in the 21st Century, Brill, 2025.)

Non-economic incentives

The non-economic incentives suggested below vary widely. Some of them are not incentives per se, but the working group feels that they fit the broader question it was tasked to answer.

An essential component to incentivise (or perhaps rather to facilitate) ADR activities, is to encourage standardized interfaces and common technical requirements. This would enable ADR and in-orbit servicing, make the commercially viable, and make operations safer. Naturally, these standards will primarily need to be elaborated by technical organisations (including space agencies), but incentives can be explored to encourage such standardisation. For example, through technological cross-fertilisation where operators from different states seek to work within the same standards.

Participation in the Space Sustainability Rating (SSR) system (see here) could be utilised to encourage compliance. Certification/labelling schemes (e.g., a "clean space" badge) for sustainability compliance. There is an interesting regulatory analogy to be found in the maritime sphere. Insurers play an important role here, where only those ships that adhere to certain standards and attain certain

certificates (e.g. on preventing marine pollution) will be insured. A parallel can be made to outer space where insurers also play an important role (especially in light of liability provisions in OST/LIAB). When insurers can be convinced to only insure those space activities that attain a Space Sustainability Rating (and at the same time the SSR is made increasingly precise and demanding to keep up with environmental needs and technological development, and especially is altered to include ADR activities), it would be a strong incentive (quasi-economic) for operators to attain a SSR. Alternatively, instead of targeting the insurers, states could include the SSR within licences. In the further alternative, as (commercial) space activities grow such a concept could be compared to the "Eu Bio Label" on products. If a certain space service supports ADR, it could ascertain this label and use it as a marketing strategy to consumers.

Efforts could be increased to improve models and simulations of the Kessler effect. In turn, these simulations could be used within (popular) scientific outreach to inform the broader public of the dangers of the Kessler syndrome and create a necessary public consciousness that would increase public demand to deal with the debris problem, including through ADR activities. Naturally, this is a much more indirect approach/incentive. Additionally, these simulations could also be used to inform operators specifically on the effects of the proliferation of space debris on their space assets to encourage more responsible behaviour. These presentations could entail easy schematics showing that ADR (and mitigation) are more cost-efficient in the long-term than repairing or substituting in-orbit space assets.

Finally, narratives that emphasise the connection and mandate of ADR in Articles I and IX of the OST could help create new views and approaches to ADR. E.g., emphasising that ADR is in the benefit of all and that the freedom of exploration and use indirectly require such activities to keep the space environment (as the operational environment for all space activities) explorable and exploitable. Equally for Article IX of the OST, emphasising that the due regard requirement as well as the prohibition of harmful contamination require ADR activities. Due regard could hereby be interepreted in accordance with the jurisprudence of the International Court of Justice, thus requiring due diligence measures for the prevention of transboudary harm, which could logically be easily be interpreted to include ADR and similar activities. The utilisation of the jurisprudence of international tribunals (as well as international environmental law) is uderused in such instances and could be utilised to further develop space law in future.

Question of Inclusion

Overshadowing these incentives is perhaps the bigger question whether incentives should be included in the final outcome document of the committee. Many of these incentives move away from legal aspects of space debris remediation. They do not suggest what the legal interpretation of existing international space law should be in light of space debris remediation nor how certain legal questions should perhaps be resolved, but instead move towards issues of policy. Their inclusion could risk resistance against the final outcome document. This is, however, a question that needs to be picked up by the full committee.

Working Group 4

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16 Bilaga 6: Arbetsgruppen 3 (definitioner) – Working Paper #01 »Working Method, First-Year Phases, Legal-Source and Standards Inventory, and Preliminary Catalog of Terms»

INTERNATIONAL LAW ASSOCIATION

Working Group 3 on Definitions

Committe on Legal Aspects of Space Debris Remediation

Internal Working Paper #01

Working Method, First-Year Phases, Legal-Source and Standards Inventory, and Preliminary Catalog of Terms

Executive Summary

A. On July 13, 2026, the group agreed on a working method, first-year phases, a preliminary legal-source and standards inventory, and a non-final catalog of terms requiring definition.

B. The immediate product should not be a published lexicon. It should be a defensible beginning: a disciplined, technically aware, and operationally useful process that can support the Committee's broader work.

C. Comments should be invited in three practical columns: (*i*) agreement, (*ii*) difficulty, and (*iii*) additional source. This will distinguish legal disagreement from technical, commercial, security-related, or terminological difficulty.

D. Before the August 18, 2026 Vienna meeting, the group should aim for a consolidated drafting table showing which terms are core, which belong in commentary, which require a drafting note, and which should be deferred.

E. The group should keep open whether the Committee's final product should contain a definitions article, a glossary, or both; a combined approach may ultimately be the most useful solution.

F. The definitions work should remain compatible with an iterative model: it may support a future definitions article, a glossary, or a model set of issues and headings for national implementation, without assuming that States will adopt a comprehensive model law wholesale.

I. Purpose and Procedural Posture

1. This first internal working paper has a limited and practical purpose. Working Group 3 has been asked to consider whether the Committee should provide a list of relevant definitions for its work on space debris remediation and, if so, which definitions should be included. The task is not editorial only. Definitions will shape how the Committee handles legal continuity, consent, jurisdiction, responsibility, verification, and the commercial organization of remediation missions.[1]

2. The Committee's mandate is four-year and outcome-oriented. In the first year, the Committee is to collect existing legal instruments, technological materials, governmental practice, industry developments, and political positions. The second year is to produce a report of first findings. The third year is to develop possible solutions. The fourth year is to present a resolution and an implementation-oriented manual. The definitions work should therefore support the mandate without prematurely deciding issues that belong to later stages.

3. This paper proposes a working method, a sequence of first-year phases, an initial inventory of binding instruments, legally non-binding instruments and standards, and a preliminary catalog of terms that may require definition. It is designed so that Working Group 3 can report at the Committee's Vienna working meeting, scheduled for August 18, 2026, that a structured discussion process is already under way.

II. Proposed Working Method

4. The group should proceed by successive, documented narrowing. It should first identify categories of terms whose definition would produce legal consequences. This approach reduces two risks: over-defining technical matters better left to standards or commentary, and under-defining legal terms that determine consent, authority, liability, and proof. Technical methods for space debris remediation should remain outside the definitions exercise, except where terminology must be coordinated with evolving standards and mission practice through liaison with the *International Organization for Standardization* and the *Inter-Agency Space Debris Coordination Committee.*

5. Four workstreams are suggested:
   (*i*) The **inventory workstream** should collect relevant treaties, resolutions, principles, guidelines, standards, manuals, national laws, and programmatic documents.
   (*ii*) The **taxonomy workstream** should identify the universe of potentially relevant concepts.
   (*iii*) The **drafting workstream** should produce short, consequences-based definitions of core concepts.
   (*iv*) The **validation workstream** should test each proposed definition against realistic mission scenarios as well as against doctrinal concepts in international law, notably in space law.

[1] International Law Association: Proposal for an ILA Committee on Space Law: Legal Aspects of Space Debris Remediation (January 2025), Summary of Work Programme and Statement of the Problem.

6. The group should use a shared document repository and a rolling drafting table. Each entry should state the proposed term, possible definition, legal source, operational source, unresolved issue, and drafting note. Where a term is used in the existing space treaties but not defined, the table should say so expressly. This will help the Committee distinguish treaty interpretation from new normative choice.

7. Drafting discipline matters. This internal paper should remain within Working Group 3 until the members have discussed and agreed on the wording. Once a consolidated version is agreed, it can be presented to the Committee as a working basis, not as a final recommendation.

8. Before any submission to the full Committee, the consolidated text should be shared with the other working groups for targeted feedback, so that terminology used in or developed by Working Group 3 does not diverge from the Committee's work on legal problems, commercialization, incentives, or implementation.

III. First Mandate-Year Phases

9. The first phase should be mapping. The group should identify binding treaty terms, non-binding legal instruments, technical standards, and operational materials that already influence vocabulary in debris mitigation, remediation, rendezvous and proximity operations, and on-orbit servicing. The second phase should be classification. The group should distinguish terms that are legally operative from terms that are technical, evidentiary, commercial, or descriptive. The third phase should be drafting. The group should begin with a limited number of core terms. The fourth phase should be validation. Each draft definition should be tested against practical scenarios, including removal of a registered derelict satellite, inspection of an unidentified object, controlled re-entry, and mission failure as well as against doctrinal concepts in international law, notably in space law.[2]

10. The first August 18, 2026 objective should be modest but tangible. The group should explain its method, present its initial inventory, identify definitional clusters, and show an initial catalog. It should not claim premature consensus on sensitive concepts such as deemed consent, emergency removal, or the relationship between "space debris remediation" and "active debris removal" or between "space object" and "space debris." The August 18 target should be understood as ambitious but useful; the purpose is to enable informed Committee discussion, not to freeze the Group's final vocabulary.

IV. Initial Inventory of Binding and Non-binding Instruments, Standards, and Texts

11. The inventory should begin with binding space law [*see* subsection (*i*) *infra*]. Its distinctive value, however, will lie in mapping the non-binding instruments that already shape State practice, licensing expectations, and industry standards. It should therefore include, at a minimum, the documents and standards listed in subsection (*ii*) *infra.* In addition, the inventory should contain a selective national-law appendix covering

[2] *See* the Annex for a tentative working structure of the first-year phases.

major and representative spacefaring jurisdictions; that appendix should serve as comparative material for definitional choices, not as an attempt to harmonize national law [*see* subsection (*iii*) *infra*].

(*i*) Binding Instruments and Authoritative Statements of Customary International Law

[01] United Nations General Assembly Resolution 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, 13 December 1963[3]

[02] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 27 January 1967[4]

[03] Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 22 April 1968[5]

[04] Convention on International Liability for Damage Caused by Space Objects, 29 March 1972[6]

[05] Convention on Registration of Objects Launched into Outer Space, 14 January 1975[7]

[06] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 18 December 1979[8]

[07] International Institute for the Unification of Private Law (UNIDROIT), Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets, Berlin, 9 March 2012 (not in force)[9]

(*ii*) Non-binding Instruments, Standards, and Texts

[08] Artemis Accords: Principles for Cooperation in the Civil Exploration and Use of the Moon, Mars, Comets, and Asteroids for Peaceful Purposes, 13 October 2020[10]

[09] Cologne Commentary on Space Law, Volumes I–III (as authoritative law commentary rather than as an instrument to be treated on the same footing as treaties, resolutions, or technical standards)[11]

[3] https://digitallibrary.un.org/record/203965/files/A_RES_1962%28XVIII%29-EN.pdf. – Although the resolution is not binding as such, it is widely regarded as an authoritative statement of the foundational principles of international space law. To the extent that those principles are reflected in the treaties under [02], [03], [04], [05] or [06] and supported by subsequent State practice and *opinio juris,* they may properly be treated as expressing customary international law.

[4] 610 U.N.T.S. 205; https://treaties.un.org/doc/Publication/UNTS/Volume%20610/volume-610-I-8843-English.pdf

[5] 672 U.N.T.S. 119; https://treaties.un.org/doc/Publication/UNTS/Volume%20672/volume-672-I-9574-English.pdf

[6] 961 U.N.T.S. 187; https://treaties.un.org/doc/Publication/UNTS/Volume%20961/volume-961-I-13810-English.pdf

[7] 1023 U.N.T.S. 15; https://treaties.un.org/doc/Publication/UNTS/Volume%201023/v1023.pdf

[8] 1363 U.N.T.S. 21; https://treaties.un.org/doc/Publication/UNTS/Volume%201363/volume-1363-I-23002-English.pdf

[9] Especially Article I(2)(j) ("space") and Article I(2)(k) ("space asset"); https://www.unidroit.org/instruments/security-interests/space-protocol/

[10] https://www.nasa.gov/wp-content/uploads/2022/11/Artemis-Accords-signed-13Oct2020.pdf?emrc=6a460b7c71650

[11] Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, Gérardine Meishan Goh (eds.), *Cologne Commentary on Space Law Volume I: Outer Space Treaty,* Cologne: Carl Heymanns Verlag, 2009; Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl and Peter Stubbe (eds.), *Cologne Commentary on Space Law. Volume II: Rescue Agreement, Liability Convention, Registra-*

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[10] Committee on the Peaceful Uses of Outer Space, Guidelines for the Long-term Sustainability of Outer Space Activities, 2019[12]

[11] Committee on the Peaceful Uses of Outer Space, Report of the Scientific and Technical Subcommittee on the Work of Its Thirty-Second Session, 24 February 1995[13]

[12] Committee on the Peaceful Uses of Outer Space, Report of the Scientific and Technical Subcommittee on the Work of Its Thirty-Fourth Session, 10 March 1997[14]

[13] Consortium for Execution of Rendezvous and Servicing Operations, Guiding Principles for Commercial Rendezvous and Proximity Operations (RPO) and On-Orbit Servicing (OOS)[15]

[14] Consortium for Execution of Rendezvous and Servicing Operations, CONFERS Recommended Design and Operational Practices[16]

[15] Consortium for Execution of Rendezvous and Servicing Operations, CONFERS Lexicon of Terms and Definitions[17]

[16] European Code of Conduct for Space Debris Mitigation, 28 June 2004, Issue 1.0[18]

[17] European Cooperation for Space Standardization, ECSS-U-AS-10C Rev. 2, Adoption Notice of ISO 24113 "Space systems — Space debris mitigation requirements," 9 February 2024[19]

[18] European Space Agency, ESA Space Debris Mitigation Requirements, ESSB-ST-U-007, Issue 1 Revision 1, 23 October 2025[20]

[19] European Space Agency, ESA's Annual Space Environment Reports (since 2017, especially the evolution of the definition of space debris in the 2017 and 2018 reports)[21]

[20] European Space Agency, Statement for a Responsible Space Sector, 21 November 2022[22]

[21] European Space Agency, Zero Debris Charter: Towards a Safe and Sustainable Space Environment[23]

[22] European Space Agency, Zero Debris Technical Booklet[24]

tion Convention, Moon Agreement, Cologne: Carl Heymanns Verlag, 2013; Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl, Peter Stubbe (eds.), *Cologne Commentary on Space Law. Volume III: UNGA Resolutions,* Cologne: Carl Heymanns Verlag, 2015; https://research.wolterskluwer-online.de/document/332c7692-90c8-36b9-9648-15aba96bd4aa (requires subscription)

[12] U.N. Doc. A/74/20, Annex II; https://www.unoosa.org/documents/pdf/PromotingSpaceSustainability/Publication_Final_English_June2021.pdf

[13] U.N. Doc. A/AC.105/605, para. 95; https://www.unoosa.org/pdf/reports/ac105/AC105_605E.pdf

[14] U.N. Doc. A/AC.105/672, para. 112; https://www.unoosa.org/pdf/reports/ac105/AC105_672E.pdf

[15] https://cdn.ymaws.com/satelliteconfers.org/resource/resmgr/confers_publications/confers-guiding-principles_r.pdf

[16] https://cdn.ymaws.com/satelliteconfers.org/resource/resmgr/confers_publications/confers_operating_practices_.pdf

[17] https://cdn.ymaws.com/satelliteconfers.org/resource/resmgr/pdfs/confers_lexicon_paper-202423.pdf

[18] https://www.unoosa.org/documents/pdf/spacelaw/sd/European_code_of_conduct_for_space_debris_mitigation.pdf

[19] https://ecss.nl/standard/ecss-u-as-10c-rev-2-adoption-notice-of-iso-24113-space-systems-space-debris-mitigation-requirements-9-february-2024/

[20] https://sdup.esoc.esa.int/documents/download/ESSB-ST-U-007_Issue_1_Revision_1_23_October_2025.pdf

[21] https://www.esa.int/Space_Safety/Space_Debris/ESA_Space_Environment_Report_2025

[22] https://www.responsiblespacesector.com/_files/ugd/ec5056_4352baf8c13345b3b2fc7bee12afc9d9.pdf

[23] https://esoc.esa.int/sites/default/files/Zero_Debris_Charter_EN.pdf

[24] https://esamultimedia.esa.int/docs/spacesafety/Zero_Debris_Technical_Booklet.pdf

[23] European Union, Draft International Code of Conduct for Outer Space Activities, 31 March 2014[25]

[24] European Union, Proposal for a Regulation of the European Parliament and of the Council on the safety, resilience and sustainability of space activities in the Union (EU Space Act), 25 June 2025[26]

[25] European Union, Proposal for a Regulation of the European Parliament and of the Council on the safety, resilience and sustainability of space activities in the Union (EU Space Act, Presidency Compromise Text), 2025/0335 (COD), Annex, 30 March 2026[27]

[26] European Union, Regulation (EU) 2021/696 of the European Parliament and of the Council of 28 April 2021 establishing the Union Space Programme and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013 and (EU) No 377/2014 and Decision No 541/2014/EU[28]

[27] Global Expert Group on Sustainable Lunar Action, Recommended Framework and Key Elements for Peaceful and Sustainable Lunar Activities[29]

[28] Inter-Agency Space Debris Coordination Committee, IADC Space Debris Mitigation Guidelines, IADC-02-01, Revision 4, 16 January 2025[30]

[29] International Academy of Astronautics, Position Paper on Orbital Debris, Updated edition, September 2001[31]

[30] International Law Association, International Instrument on the Protection of the Environment from Damage Caused by Space Debris, Final Report to the Sixty-sixth Conference, Buenos Aires, 1994[32]

[31] International Organization for Standardization, ISO 24113:2023, Space systems — Space debris mitigation requirements[33]

[32] International Organization for Standardization, ISO 24330:2022, Space systems — Rendezvous and Proximity Operations (RPO) and On-Orbit Servicing (OOS) – Programmatic principles and practices[34]

[33] International Telecommunication Union, Recommendation ITU-R S.1003-2, Environmental protection of the geostationary-satellite orbit, 12/2010, Annex 1[35]

[25] https://www.eeas.europa.eu/sites/default/files/space_code_conduct_draft_vers_31-march-2014_en.pdf

[26] Doc. COM/2025/335 final; https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52025PC0335

[27] https://data.consilium.europa.eu/doc/document/ST-7806-2026-INIT/en/pdf

[28] Doc. PE/21/2021/INIT. – OJ L 170, 12.5.2021; https://eur-lex.europa.eu/eli/reg/2021/696/oj/eng

[29] Global Expert Group on Sustainable Lunar Activities, Recommended Framework and Key Elements for Peaceful and Sustainable Lunar Activities (2022), https://moonvillageassociation.org/gegsla/documents/gegsla-recommended-framework/#

[30] https://www.iadc-home.org/documents_public/file_down/id/5836

[31] https://conference.sdo.esoc.esa.int/proceedings/sdc3/paper/7/SDC3-paper7.pdf

[32] "International Instrument on the Protection of the Environment from Damage Caused by Space Debris," *Final Report to the Sixty-sixth Conference, Buenos Aires, 1994,* at pages 317–321. – *See also* Permanent Observer of the International Law Association: Proposal to the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space: Review of Existing Norms of International Law Applicable to Space Debris, U.N. Doc. A/AC.105/C.2/L.231 (29 January 2002), https://digitallibrary.un.org/record/461118/files/A_AC.105_C.2_L.231-EN.pdf.

[33] https://www.iso.org/standard/83494.html

[34] https://www.iso.org/standard/78463.html

[35] https://www.unoosa.org/documents/pdf/spacelaw/sd/R-REC-S1003-2-201012-IPDF-E.pdf

[34] Space Security Lexicon (as a security-vocabulary reference tool for terminology that overlaps with security-related remediation questions)[36]

[35] Space Sustainability Rating Association, The Rating[37]

[36] The Hague International Space Resources Governance Working Group, Building Blocks for the Development of an International Framework for the Governance of Space Resource Activities[38]

[37] The McGill Manual on International Law Applicable to Military Uses of Outer Space, Volume I: Rules[39]

[38] The Woomera Manual on the International Law of Military Space Operations[40]

[39] United Nations Committee on the Peaceful Uses of Outer Space, Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, 2010[41]

[40] United Nations General Assembly Resolution 59/115, Application of the concept of the "launching State"[42]

[41] United Nations General Assembly Resolution 62/101, Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects[43]

[42] United Nations General Assembly Resolution 68/74, Recommendations on national legislation relevant to the peaceful exploration and use of outer space[44]

[43] United Nations General Assembly Resolution 77/41, Destructive direct-ascent anti-satellite missile testing[45]

[44] United Nations General Assembly Resolution 79/1, The Pact for the Future[46]

[45] United Nations Secretary-General, Our Common Agenda Policy Brief 7: For All Humanity – the Future of Outer Space Governance, May 2023[47]

[36] Almudena Azcárate Ortega and Victoria Samson (eds.), *A Lexicon for Outer Space Security,* Geneva: United Nations Institute for Disarmament Research and Secure World Foundation, 2023; https://doi.org/10.37559/WMD/23/Space/05

[37] Space Sustainability Rating Association, The Rating, https://spacesustainabilityrating.org/the-rating/, including its publicly available methodology and associated implementation materials. – *See also* Francesca Letizia, Stijn Lemmens, Danielle Wood, Moriba Jah, Miles Lifson, Richard Steindl, Ariel Ekblaw, Kazuto Suzuki and Nikolai Khlystov, Paper No 95 "Framework for the Space Sustainability Rating," *Proceedings of the 8th European Conference on Space Debris,* ESA Space Operations Centre, Darmstadt, 20–23 April 2021; https://conference.sdo.esoc.esa.int/proceedings/sdc8/paper/95/SDC8-paper95.pdf.

[38] The Hague International Space Resources Governance Working Group, *Building Blocks for the Development of an International Framework on Space Resource Activities, adopted 12 November 2019;* https://www.unoosa.org/documents/pdf/copuos/lsc/space-resources/DraftPrinciplesContributions/LU_NL_Joint_Submission_20241115_FINAL.pdf

[39] https://www.mcgill.ca/milamos/sites/milamos/files/mcgill_manual_volume_i_-_rules_final_0.pdf

[40] https://academic.oup.com/oxford-law-pro/book/57847.

[41] ST/SPACE/49; https://www.unoosa.org/pdf/publications/st_space_49E.pdf

[42] https://www.unoosa.org/pdf/gares/ARES_59_115E.pdf

[43] https://www.unoosa.org/pdf/gares/ARES_62_101E.pdf

[44] https://www.unoosa.org/pdf/gares/A_RES_68_074E.pdf

[45] https://docs.un.org/en/A/res/77/41

[46] https://docs.un.org/en/a/res/79/1

[47] https://www.un.org/sites/un2.un.org/files/our-common-agenda-policy-brief-outer-space-en.pdf

[46] United Nations Secretary-General, Reducing space threats through norms, rules and principles of responsible behaviours, Report of the Secretary-General, 13 July 2021[48]

[47] World Economic Forum, European Space Agency, Space Industry Debris Mitigation Recommendations. Future of Space Network — Sustainable Space Initiative, Centre for the Fourth Industrial Revolution, June 2023[49]

(*iii*) Selective National Legislation

The group is mindful of the fact that the United Nations Office for Outer Space Affairs (UNOOSA) has published, and continues to update, a comprehensive collection of national laws and regulations related to the exploration and use of outer space, as submitted by States.[50] For the purposes of this subsection, however, the national-law overview is more selective: it identifies, as comparative material, *selected* national instruments that translate space-debris mitigation, end-of-life disposal, remediation-adjacent activity, or launch-related debris management into authorization, licensing, registration, or technical-standard mechanisms:

[48] **Australia**

Legal sources: Space (Launches and Returns) Act 2018 (current citation of Act No. 123 of 1998 as renamed and amended, with the 2018 amendments commencing 31 August 2019);[51] Space (Launches and Returns) (General) Rules 2019 (made 29 August 2019).[52]

Brief explanatory note: Applications for Australian launch permits and overseas payload permits must include debris-mitigation strategies; Rules sections 54 and 79 require those strategies to be based on an internationally recognized guideline or standard, describe orbital-debris-mitigation measures, and include an orbital-debris assessment.

[49] **China**

Legal sources: Interim Measures on Space Debris Mitigation and Protection Management, issued in 2009,[53] and GB/T 34513-2017, Space Debris Mitigation Requirements (issued 1 November 2017; implemented 1 May 2018),[54] together with related national technical standards.[55]

[48] U.N. Secretary-General, Reducing Space Threats Through Norms, Rules and Principles of Responsible Behaviours, U.N. Doc. A/76/77 (13 July 2021), https://digitallibrary.un.org/record/3952870/files/A_RES_76_231-EN.pdf

[49] https://www3.weforum.org/docs/WEF_Space_Industry_Debris_Mitigation_Recommendations_2023.pdf

[50] https://www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/index.html. – For the UNOOSA National Space Law and Policy Database on its Accessing Space Treaty Resources Online (ASTRO) portal *see* https://astro.unoosa.org/astro/en/index.html.

[51] https://www.legislation.gov.au/C2004A00391/latest/text

[52] https://www.legislation.gov.au/F2019L01118/latest/text

[53] Interim Measures for Space Debris Mitigation and Protection Management [空间碎片减缓与防护管理暂行办法]; https://vienna.china-mission.gov.cn/hplywk/201304/t20130422_8867301.htm

[54] Space Debris Mitigation Requirements [空间碎片减缓要求]; https://www.cnsa.gov.cn/english/n6465684/n6465689/index.html

[55] https://openstd.samr.gov.cn/bzgk/std/newGbInfo?hcno=0659F98ADD34DB0A751B9221F4785CA6

Brief explanatory note: Management measures for spacecraft development and operation are complemented by standards adopting or aligning with ISO debris-mitigation requirements, including launch-vehicle operational-debris mitigation, pre-launch debris-mitigation review, collision-warning technical requirements, terminology, environmental models, and on-orbit-removal guidance.

[50] **Denmark**

Legal sources: Outer Space Act, Act No. 409 of 11 May 2016 (activities in outer space),[56] and Executive Order No. 552 of 31 May 2016[57] on requirements in connection with approval of activities in outer space.

Brief explanatory note: Relevant provisions: approval requires appropriate measures with regard to space-debris management; section 6 of the Executive Order permits requirements that activities meet relevant standards and guidelines for space-debris management, including ECSS or ISO standards, and contains a 25-year end-of-life disposal rule; section 7 addresses environmental impacts in outer space.

[51] **France**

Legal sources: Law No. 2008-518 of 3 June 2008 on Space Operations (Loi n° 2008-518 du 3 juin 2008 relative aux opérations spatiales),[58] together with the Technical Regulation of 31 March 2011 as amended, including Article 40-2 inserted in 2024.[59]

Brief explanatory note: Authorizations may include prescriptions to limit risks linked to space debris; "space debris" is defined; the technical regulation requires limitation of debris during nominal operations, passivation, collision-risk prevention, end-of-life disposal from protected regions, and design measures facilitating later active debris removal.

[52] **India**

Legal sources: No comprehensive enacted space act specifically addressing space debris was identified. The relevant national instruments are regulatory and policy instruments: the Indian Space Policy 2023[60] and the IN-SPACe Norms, Guidelines and Procedures for Implementation of Indian Space Policy 2023 in respect of Authorization of Space Activities (3 May 2024),[61] together with the Debris-Free Space Missions initiative announced in 2024 for all Indian space actors by 2030.[62]

[56] https://ufm.dk/media/xragv1p5/outer-space-act.pdf

[57] https://ufm.dk/media/tqhpnskw/executive-order-on-requirements-in-connection-with-approval-of-activities-in-outer-space-etc-_final.pdf

[58] https://www.legifrance.gouv.fr/loda/id/JORFTEXT000018931380/?__cf_chl_f_tk=dU4s5eIUUEH-RfIaZMgR0UEEWbQ4I.GzBAUO3vTuDKBw-1783249077-1.0.1.1-ZU1fq18ECb5Er6Rd7FuW_f4ensfvZU2Nz_0MzxP5DkQ

[59] https://www.legifrance.gouv.fr/loda/id/JORFTEXT000024095828/

[60] https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf

[61] https://www.inspace.gov.in/sys_attachment.do?sys_id=5d532e37877102503b0f0d060cbb35cf; https://www.inspace.gov.in/inspace/sys_attachment.do?sys_id=bb786ff33b6d0b1063ff0a34c3e45ab5

[62] https://www.isro.gov.in/Debris_Free_Space_Missions.html

Brief explanatory note: Authorization of nongovernmental space activities, authorization materials for space-situational-awareness activities, and policy commitments to debris-free missions through design and execution of mitigation guidelines.

[53] **Italy**

Legal sources: Law No. 89 of 13 June 2025, Provisions on the Space Economy (Legge 13 giugno 2025, n. 89, Disposizioni in materia di economia dello spazio).[63]

Brief explanatory note: Article 2(a) includes launch, release, in-orbit management, re-entry, disposal from Earth orbits, removal of objects, and in-orbit services within "space activity"; Article 5(1)(a) requires technical suitability standards addressing light and radio pollution and mitigation of the effects of space debris, including safe and, where possible, controlled atmospheric re-entry; Article 5(1)(c) addresses environmental sustainability over the life cycle.[64]

[54] **Japan**

Legal sources: Act on Launching Spacecraft and Launch Vehicle and Control of Spacecraft, Act No. 76 of 2016 (16 November 2016),[65] together with Cabinet Office licensing guidelines,[66] and JAXA Space Debris Mitigation Standard JMR-003E (27 April 2023).[67]

Brief explanatory note: Article 22 requires licensed spacecraft control to meet standards preventing harmful contamination and interference, including collision avoidance, termination measures, safe re-entry or graveyard disposal, and passivation where disposal cannot otherwise be implemented; the on-orbit-servicing guideline defines space debris, on-orbit servicing, and active debris removal.

[55] **Kazakhstan**

Legal sources: Law of the Republic of Kazakhstan No. 528-IV "On Space Activities" of 6 January 2012,[68] and Government Decree No. 838 of 26 June 2012 approving the Rules for coordination and decision-making on launches of space objects, as amended.[69]

Brief explanatory note: The statutory framework regulates space activities, space objects, and utilization of space technology; the launch-approval rules define "space object" to include spacecraft, launch means, and their components and require pre-launch governmental coordination for launches by Kazakhstani participants. These materials are most relevant to launch-related debris and fall-zone management rather than to a full orbital-debris-mitigation regime.

[63] https://www.gazzettaufficiale.it/eli/id/2025/06/24/25G00095/SG

[64] https://www.doctrine.it/norms/laws/itatext0t3ejzg81vs36/articles/itaart3fsrk7jdzdvj41j

[65] https://www.japaneselawtranslation.go.jp/en/laws/view/4813/en

[66] https://www8.cao.go.jp/space/english/activity/documents/guideline_00sgl.pdf

[67] https://sma.jaxa.jp/TechDoc/Docs/E_JAXA-JMR-003E.pdf

[68] https://www.unoosa.org/documents/pdf/spacelaw/national/kazakhstan/528-IV_2012-01-06E.pdf; https://adilet.zan.kz/eng/docs/Z1200000528

[69] https://zakon.uchet.kz/eng/docs/P1200000838

[56] **Norway**

Legal sources: Act relating to activities in outer space (the Space Act), Act No. 128 of 22 December 2025, replacing the earlier Act No. 38 of 13 June 1969 on launching objects from Norwegian territory into outer space.[70]

Brief explanatory note: The new Act establishes authorization and supervision for Norwegian space activities and, according to Norway's space-traffic-management submission, takes into account the need to limit space debris; implementing regulations should be monitored for detailed definitions and operator duties.

[57] **Pakistan**

Legal sources: Pakistan Space Activities Rules 2024, promulgated by the Federal Government on 2 February 2024.[71]

Brief explanatory note: The Rules establish the Pakistan Space Activities Regulatory Board and require authorization and regulation of outer-space and upper-atmosphere activities; the application materials refer to the Guidelines for the Long-term Sustainability of Outer Space Activities and the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space.

[58] **Portugal**

Legal sources: Decree-Law No. 16/2019 of 22 January 2019 establishing the regime of access to and exercise of space activities,[72] as amended by Decree-Law No. 20/2024 of 2 February 2024,[73] and Regulation No. 697/2019 of 5 September 2019,[74] as amended by Regulation No. 1206-A/2024 of 21 October 2024.[75]

Brief explanatory note: Licensing and registration materials require information on space-debris mitigation, incidents and anomalies, end-of-life data, and space debris in orbit caused by the space object.

[59] **Russian Federation**

Legal sources: Law of the Russian Federation No. 5663-I "On Space Activities" of 20 August 1993;[76] Federal Law No. 215-FZ "On the State Corporation for Space Activities Roscosmos" of 13 July 2015;[77] and National Standard GOST R 52925-2018 "Space Technology Items General Requirements on Space

[70] https://lovdata.no/dokument/NLE/lov/2025-12-22-128/KAPITTEL_8#%C2%A729

[71] https://psarb.gov.pk/assets/client/pdf/6943-23-Ex-II-National%20Command%20Authority.pdf

[72] https://ptspace.pt/wp-content/uploads/2020/05/lei-do-espaco.pdf

[73] https://www.anacom.pt/render.jsp?contentId=1773528

[74] https://www.anacom.pt/render.jsp?contentId=1496233

[75] https://www.anacom.pt/render.jsp?contentId=1802981

[76] https://faolex.fao.org/docs/pdf/rus68717.pdf

[77] https://faolex.fao.org/docs/pdf/rus233794.pdf

Systems for the Mitigation of Human-Produced Near-Earth Space Pollution" (approved 21 September 2018; effective 1 January 2019).[78]

Brief explanatory note: Article 22 of the 1993 Law requires due regard to permissible anthropogenic burden on the environment and near-Earth space; the Roscosmos law assigns work to reduce pollution of near-Earth space; GOST R 52925-2018 contains technical debris-mitigation requirements over the spacecraft life cycle, including passivation and disposal.

[60] **United Kingdom**

Legal sources: Outer Space Act 1986 (18 July 1986),[79] Space Industry Act 2018 (15 March 2018),[80] and Space Industry Regulations 2021 (S.I. 2021/792, made 12 July 2021).[81]

Brief explanatory note: Licensing may impose safety and international-obligation conditions; regulation 101 requires an orbital operator to prevent contamination of outer space, avoid the release of space debris, avoid collisions, prevent break-up, and dispose of the space object at end of life; Schedule 1 requires an orbital-debris-mitigation statement describing engineering, design, and operational measures.[82]

[61] **United States**

Legal sources: Code of Federal Regulations, Title 47, Part 25, §§ 25.114(d)(14),[83] 25.283,[84] as amended by the Federal Communications Commission's orbital-debris rulemakings, including FCC 22-74 (adopted 29 September 2022), and Code of Federal Regulations, Title 14, Part 450, § 450.171.[85]

Brief explanatory note: Orbital-debris-mitigation disclosures for satellite licensing, trackability, proximity operations, disposal planning, geostationary graveyard disposal, low-Earth-orbit post-mission disposal within five years, passivation, and launch-vehicle end-of-launch debris controls.

12. These instruments should not be treated as equivalent. United Nations resolutions and COPUOS guidelines supply political and legal orientation; IADC, ISO, ECSS, ESA, and CONFERS materials translate risk into operational practice; military-space manuals may help where security vocabulary overlaps with remediation.

[78] The download of the National Standard of the Russian Federation GOST R 52925-2008 "SPACE TECHNOLOGY ITEMS. General Requirements on Space Systems for the Mitigation of Human-Produced Near-Earth Space Pollution" is a charged service. An electronical copy of this standard in the Russian language can be made available upon request to the members of the ILA Committee on Legal Aspects of Space Debris Remediation. The standard is explained by S. Loginov, M. Yakovlev, M. Mikhailov and L. Popkova in their Paper No. 62 "National Standard of the Russian Federation for Space Debris Mitigation," *Proceedings of the 5th European Conference on Space Debris,* ESA Space Operations Centre, Darmstadt, 30 March–2 April 2009, https://conference.sdo.esoc.esa.int/proceedings/sdc5/paper/62/SDC5-paper62.pdf.

[79] https://www.legislation.gov.uk/ukpga/1986/38/contents

[80] https://www.legislation.gov.uk/ukpga/2018/5/contents

[81] https://www.legislation.gov.uk/uksi/2021/792/regulation/101

[82] https://www.legislation.gov.uk/uksi/2021/792/schedule/1

[83] https://www.ecfr.gov/current/title-47/chapter-I/subchapter-B/part-25/subpart-B/subject-group-ECFRe2bd70fc6b2eea0/section-25.114

[84] https://www.ecfr.gov/current/title-47/chapter-I/subchapter-B/part-25/subpart-D/section-25.283

[85] https://www.ecfr.gov/current/title-14/chapter-III/subchapter-C/part-450/subpart-C/section-450.171

Technical standards should inform legal definitions, but they should not replace them. The Committee's vocabulary must remain intelligible to legislators, regulators, operators, insurers, investors, and courts.

V. Proposed Clusters of Concepts Requiring Legal Definition

13. The catalog should be built from legal function, not from terminology alone. A definition is useful when it affects authority, consent, jurisdiction, responsibility, licensing, liability, evidence, or commercial implementation.

14. The first cluster consists of **treaty-anchored legal-status terms.** These terms determine who is responsible, who may authorize, who retains jurisdiction and control, and which State may need to be notified or consulted. The term "space object" is especially important because debris may be better understood as a regulatory subcategory of space object rather than as a legally detached category.[86] At the same time, the definition should make clear that "space debris" and "space object" are not synonyms: debris may remain a space object for purposes of jurisdiction, control, registration, and liability, while serving as a distinct regulatory category for remediation, prioritization, and evidentiary assessment.

15. The second cluster consists of **debris-specific terms**. The point is not taxonomy for its own sake. The point is to identify terms that influence consent pathways, notification duties, prioritization, and evidentiary burdens. The group should decide which debris categories are legally necessary and which should be left to commentary.[87]

16. The third cluster consists of **remediation and mission terms**. This is the bridge between law and operations. The group should decide whether "space debris remediation" is the umbrella term and "active debris removal" one modality, or whether the Committee will use the terms interchangeably. The distinction matters because some missions inspect, stabilize, passivate, move, or service objects without permanently removing them from an orbital region.[88]

17. The fourth cluster consists of **authorization, consent, and responsibility terms**. These are the most legally sensitive concepts. They should be drafted only after the group distinguishes neutral definitions from policy choices. In particular, concepts such as "deemed consent" or "emergency intervention" should not be

[86] Proposed treaty-status terms for the first drafting table: appropriate State; component part; launch; launch vehicle; launching Authority; launching State; operator; outer space; owner of a space object; re-entry; space activities; space object; State of registry.

[87] Proposed debris-specific terms for the first drafting table: debris of indeterminate registry; high-risk debris; identified debris; legacy debris; mission-related debris; priority debris; space debris; space debris mitigation; technically remediable debris; unidentified debris.

[88] Proposed remediation and mission terms for the first drafting table: active debris removal; capture; deorbiting; controlled re-entry; graveyard orbit; inspection; on-orbit servicing; passivation; post-mission disposal; rendezvous and proximity operations; reorbiting; space debris remediation; towing; uncontrolled re-entry; verified removal.

defined in a way that implies Committee approval before the Committee has considered the underlying policy question.[89]

18. The fifth cluster consists of **commercial, evidentiary, and implementation terms**. These terms may not all belong in a formal definitions article, but they matter if the Committee wants its work to be usable by national legislators, licensing authorities, public agencies, insurers, investors, and contracting parties. They also connect definitions to proof of performance and market design.[90]

VI. Drafting Principles

19. Five drafting principles are proposed. First, define only what has legal consequences. Second, avoid technical thresholds that may quickly become obsolete. Third, preserve treaty continuity, especially for "space object," "launching State," and "State of registry." Fourth, separate legal definitions from evidentiary criteria—that is, from the data, documentation, or verification steps needed to show that a definition is satisfied in a specific mission. Fifth, allow technical standards to inform the commentary without being incorporated wholesale unless the legal effect is clear.

20. A three-layer structure is likely to be useful: (*i*) a short definitions provision for legally operative terms, (*ii*) an explanatory commentary for interpretation, and (*iii*) a glossary for technical and operational vocabulary. This structure would keep the operative text stable while allowing the Committee to use technical materials without overburdening the legal instrument. It would also support the Committee's mandate to produce guidance that can be implemented by international and national legislators without unnecessary constraints.

VII. Expected Product for August 18, 2026

21. By the Vienna meeting, the group should aim to present a consolidated drafting table rather than a finished lexicon. The table should identify core terms, commentary terms, terms requiring further analysis, and terms to be deferred. This will show that the group has begun a structured process and will give the Committee a stable vocabulary for later work on consent, licensing, responsibility, liability, commercialization, and proof of performance. Because the definitions work is foundational for the other working groups, even a provisional table should be circulated early enough to permit meaningful comment, with any unresolved concepts clearly flagged.

[89] Proposed authorization, consent, and responsibility terms for the first drafting table: authorization; consent; consultation; continuing supervision; deemed consent; due diligence; due regard; emergency intervention; fault; liability allocation; mission-specific consent; notification; standard of care; standing consent.

[90] Proposed commercial and evidentiary terms for the first drafting table: anchor customer; data escrow; design for remediation; financial assurance; independent verification; licensed remediation operator; performance milestone; proof of performance; protected technical information; regulatory sandbox; remediation credit; remediation service; safety-critical data.

22. The most useful immediate result would be a shared understanding of method. If the group can agree on the inventory, the clusters, and the criteria for selecting core definitions, it will have done enough for the first stage. The next step can then be the drafting of concise definitions for a limited number of priority terms, beginning with those most likely to influence the Committee's treatment of consent, jurisdiction, authorization, responsibility, and verification.

Dirk Roland Haupt Theuns Kotzé Rada Popova Marie-Clotilde Runavot Gábor Sulyok

Annex

Tentative working structure of the first-year phases

Phase	Period	Main deliverable
1. Orientation and inventory	June–July 2026	Internal inventory of instruments, guidelines, standards, and doctrinal sources; preliminary list of terms.
2. Taxonomy and selection	July–September 2026	Shortlist of terms requiring definition; identification of treaty terms used without definition; first Vienna briefing.
3. Drafting of core definitions	September–December 2026	Draft definitions of legally operative terms; notes on disputed concepts and alternative formulations.
4. Scenario-testing and refinement	January–March 2027	Testing against consent, licensing, ownership, registration, liability, and verification scenarios.
5. Consolidation for Committee report	Spring 2027	Working Group 3 contribution to the Committee's first-year or second-year reporting process.

17 Bilaga 7: Diskussionsunderlaget »From Taxonomy to Draft Definitions» av Dirk Roland Haupt och Gábor Sulyok

FROM TAXONOMY TO DRAFT DEFINITIONS

An Operational Program for Phase 2 and a Prioritized Provisional Definitions Docket

Food-for-Thought Paper by Dirk Roland Haupt and Gábor Sulyok

August 16, 2026

DISCUSSION CONTRIBUTION AND OPERATIONAL PROPOSAL.
This paper has not been adopted by Working Group 3 or by the Committee. It is circulated before the Vienna meeting for transparency and comment. Any possible adoption as a Working Group paper would occur only after Vienna and in light of the Committee's deliberations, decisions, and guidance.

Executive Summary

A. Working Paper #01 established the governing sequence: inventory, taxonomy and selection, drafting, and validation. The center of gravity should now move from source collection to the controlled operation of Phase 2.

B. Phase 2 should produce two concrete outputs: a reasoned first drafting docket and a common Definition Card for term-by-term work. It should not attempt a complete lexicon or resolve substantive disputes through definitions.

C. The five concept clusters in Working Paper #01 remain the substantive framework. Candidate terms should be screened for legal consequence, source stability, operational determinability, cross-working-group need, and freedom from unresolved policy choices.

D. Consensus-capable terms should be drafted before controversial terms. The first sequence should begin with object status, debris status, remediation, active removal, re-entry, and treaty cross-references; consent modalities and substitutes, fault, abandonment, and emergency measures should remain in interpretive or deferred treatment.

E. Phase 2 requires a defined operating cycle: nomination, classification, preparation of a Definition Card, second-reader review, structured group comment, provisional disposition, and targeted consultation with the other working groups.

F. The Consolidated Findings Report of July 26, 2026 confirms the main interfaces: Working Group 1 needs stable terminology for the layered normative instrument; Working Group 2 needs precise status, attribution, authorization, and consent terms; Working Group 4 needs verifiable activity, operator, performance, and incentive terms.

G. Vienna should supply direction rather than artificial consensus. The more substantial work begins immediately afterward: approval of the method, completion of the first drafting rounds, targeted cross-working-group review, and scenario-testing during the first half of 2027.

PART I — OPERATIONAL PROGRAM FOR PHASE 2

From the Working Paper #01 clusters to a controlled first drafting tranche

I Purpose, Procedural Status, and Governing Premise

1. This paper is a discussion contribution and an operational proposal for the next stage of Working Group 3. It takes Working Paper #01 as the agreed methodological point of departure, integrates the Committee's Consolidated Findings Report of July 26, 2026, and places the prioritized provisional definitions in Part II within a workable Phase 2 sequence.[1]

2. Its governing premise is that definitions in this field are legally operative propositions. A formulation may preserve or obscure the status of a space object; identify the State whose jurisdiction and control remain engaged; determine whether notice, consultation, authorization, or consent must be addressed; structure evidence; and affect licensing, insurance, procurement, and incentives. Definitions must therefore be drafted with their legal consequences visible.

3. Working Paper #01 already supplied the principal architecture: four successive work phases, five substantive clusters, a three-layer product structure, and the rule that technical standards should inform but not displace legal analysis. The immediate task is not to reopen that architecture. It is to convert Phase 2 into an operating process and to begin drafting terms that can attract agreement without pre-empting the Committee's later work.

4. Part II supplies the first prioritized drafting docket. Its term-by-term formulations are reorganized by drafting readiness rather than alphabetically. The purpose of that reordering is practical: legally necessary and comparatively mature terms should enter the Definition Card process first; treaty-interpretive and policy-dependent terms should be preserved for commentary, cross-group consideration, or deliberate deferral.

II The Temporal Logic of Working Paper #01

5. The phases established in Working Paper #01 should govern the sequence of work. Phase 1 mapped the source base. Phase 2 classifies and selects terms. Phase 3 drafts core definitions.

[1] International Law Association (ILA), Committee on Legal Aspects of Space Debris Remediation, Mandate and Summary of Work Programme;); ILA Committee on Legal Aspects of Space Debris Remediation Working Group 3 (Definitions), Working Paper #01 — Working Method, First-Year Phases, Legal-Source and Standards Inventory, and Preliminary Catalog of Terms (July 13, 2026); ILA Committee on Legal Aspects of Space Debris Remediation, Consolidated Findings Report: A Synthesis of the Work of Working Groups 1, 2, 3 and 4 (July 26, 2026).

Phase 4 tests them against legal doctrine and realistic mission scenarios. The phases overlap at their edges, but each has a distinct legal product and should not be collapsed into the others.[2]

Table 1. Working sequence and proposed dates

Phase	Period	Principal task	Deliverable
Phase 1	June–September 2026	Maintain a version-controlled source map; close only material gaps needed for drafting.	Source Inventory #02
Phase 2	July–October 2026	Classify terms, apply selection criteria, agree the first drafting docket and Definition Card.	Taxonomy-and-selection matrix
Phase 3	November 2026–April 2027	Draft concise core definitions and alternatives in controlled rounds.	Completed Definition Cards and drafting table
Phase 4	March–May 2027	Test definitions against consent, licensing, attribution, re-entry, failure, and verification scenarios.	Scenario-tested revisions
Consolidation	May–June 2027	Integrate results into the Committee's first- or second-year reporting process.	WG3 contribution and issues note

6. Phase 1 is sufficiently mature to support Phase 2. It should now operate as a maintenance function rather than the organizing center of the project. New or revised UN, ESA, ISO, IADC, national, agency, or mission materials should be added where they alter the vocabulary, supply objective indicators, or expose a legal consequence. General source accumulation should not delay the drafting sequence.

[2] Working Group 3, Working Paper #01, §§ 9–10 and Annex (mapping; classification; drafting; validation; and the first-year timetable).

7. Phase 2 must answer two questions:
   - First, which terms are legally necessary for the Committee's work?
   - Second, which of those terms are sufficiently mature to be drafted now?

   The output should be a reasoned docket, not an undifferentiated catalog. Every inclusion, placement, or deferral should be explained by legal function and drafting readiness.

8. Phase 3 should begin as soon as the first docket is approved. It need not await completion of every research task. A controlled overlap is preferable: the source map remains open, while stable terms proceed to Definition Cards and controversial terms remain flagged. Phase 4 then tests whether apparently sound wording functions in the circumstances in which the Committee expects it to operate.

III The Legal Task of Phase 2

9. Chapter V, §§ 13–18, of Working Paper #01 identifies five clusters: (i) treaty-anchored legal-status terms; (ii) debris-specific terms; (iii) remediation and mission terms; (iv) authorization, consent, and responsibility terms; and (v) commercial, evidentiary, and implementation terms. Those clusters should remain the substantive frame because they correspond to different legal functions and different levels of sensitivity.[3]

10. Classification by cluster is necessary but not sufficient. Within each cluster, a candidate term should be tested for: (i) legal pedigree; (ii) intended legal function; (iii) legal consequence; (iv) maturity or contestability; and (v) proper placement in operative text, commentary, a glossary, a drafting note, or a deferred-issues list. These tests reveal whether a term is suitable for definition and what the definition would do.

11. The legal-consequence inquiry is controlling. A constitutive term identifies the regulated object or activity. An allocative term connects consequences to a State, owner, operator, or licensing authority. A triggering term activates notice, consultation, authorization, consent, proof, or payment. An evidentiary term specifies what must be shown. A merely descriptive term may aid communication but should not occupy scarce space in an operative definitions provision. These consequence categories cut across, rather than replace, the five substantive clusters identified in § 9 above: a treaty-status term may be constitutive or allocative, while a commercial or evidentiary term may be triggering or evidentiary.

12. Maturity must be assessed independently of importance. Some of the most important concepts—*abandonment, appropriate State, consent modalities and substitutes, distress, due regard,*

[3] Working Group 3, Working Paper #01, §§ 13–18; Consolidated Findings Report, §§ 4.3–4.5.

emergency measures, fault, and *necessity* (and, as the case may be, *countermeasures*)—are not suitable for early stand-alone definitions because wording them would presuppose a contested rule or collapse a circumstance precluding wrongfulness into a new operational category. Phase 2 should, therefore, prefer terms that are legally necessary and capable of relatively rapid agreement. Deferral is not a judgment of marginality; it is a safeguard against disguised lawmaking.

IV Phase 2 Operations Plan

13. Each candidate term should pass through the same documented operating cycle. The cycle is designed to preserve the term-by-term discipline of Part II, make disagreement visible at an early stage, and produce a record that can later support the Committee's resolution, commentary, or implementation manual.

Table 2. Operating cycle for a candidate term

Step	Action	Required treatment	Recorded output
1	Nomination	Identify the Working Paper #01 cluster and explain why the term has a material legal function.	Term docket entry
2	Threshold screen	Apply legal necessity, source stability, operational determinability, durability, policy neutrality, and cross-group dependency.	Draft now—commentary—deferral
3	Definition Card	Enter the term and proposed definition; complete all parallel legal and evidentiary modules.	Definition Card draft v1.0
4	Second-reader review	A second member tests treaty continuity, source accuracy, adjacent terms, and hidden policy choices.	Review note
5	Group comment	Members comment under four headings: agreement, difficulty, alternative formulation, additional source.	Comment matrix
6	Coordinator synthesis	Prepare a reasoned disposition: provisional consensus, competing alternatives, further research, or deferral.	Definition Card draft v2.0
7	Targeted referral	Seek focused input from another working group only where that group depends on the term's consequences.	Cross-group response
8	Validation	In Phase 4, test the wording against mission scenarios and revise the card accordingly.	Validated draft

14. The nomination step should be brief but mandatory. A term should not enter the drafting docket merely because it appears frequently in technical or legal writing. The nominating note should identify the legal consequence that requires stabilization, the Working Paper #01 cluster to which the term belongs, and the other terms with which it must be coordinated.

15. The threshold screen should be applied before substantial drafting begins. The first drafting rounds should favor terms with a treaty anchor or meaningful convergence in non-binding instruments and practice; terms capable of objective application; and terms that can be defined without deciding the underlying rule on consent, responsibility, fault, or the legal basis for emergency measures.

16. The second-reader stage should be substantive rather than stylistic. It should ask whether the proposal preserves the treaty architecture, whether the sources support the stated scope, whether the definition imports a technical standard without identifying its legal effect, and whether a non-prejudice clause is necessary.

17. The comment matrix should separate different kinds of disagreement. A source objection is not the same as a policy objection; a technical difficulty is not the same as a treaty-interpretive difficulty. Recording agreement, difficulty, alternative wording, and additional source in separate fields will prevent a general objection from obscuring a narrow and curable drafting problem.

18. No definition should be treated as adopted merely because no objection was voiced in a meeting. Provisional consensus should require circulation of the relevant Definition Card and a stated deadline. Where alternatives remain, both should be retained with the reason for disagreement. The record should show whether the matter is unresolved, deferred, or dependent on a Committee-level policy choice.

V Selection and Sequencing: Consensus Before Controversy

19. Selection should proceed through seven cumulative considerations: (i) material legal consequence; (ii) cross-working-group dependency; (iii) source stability or convergence; (iv) operational determinability; (v) durability across foreseeable technological change; (vi) necessity for operative placement; and (vii) policy neutrality. The screen is a reasoned discipline, not a numerical algorithm.

20. The first drafting sequence should be divided into three rounds:

- **Round A** should address treaty-anchored or constitutive status and activity terms most likely to attract agreement:

  active debris removal
  launching authority
  launching State
  owner of a space object
  re-entry
  space debris

space debris mitigation
space debris remediation
space object
State of registry

These terms create the basic grammar of the Committee's work and can be drafted with treaty cross-references and express non-prejudice safeguards.

- **Round B** should address supporting allocative, triggering, and evidentiary terms concerning attribution, authority, actors, and proof:

  authorization
  debris of indeterminate registry
  Earth orbit
  Earth's atmosphere
  identified debris
  launch
  remediation operator
  safety-critical data
  space activities
  verified remediation

  These terms are not all treaty terms, but they are operationally determinable and are needed by the Committee's work on consent pathways, licensing, supervision, performance, insurance, and incentives.

- **Round C** should consist of treaty-interpretive, policy-dependent, or otherwise deferred terms, including:

  abandonment
  appropriate State
  consent and consent modalities (express, standing, presumed, and deemed consent)
  distress
  dual-use or dual-purpose capability
  due regard
  emergency measures
  fault
  harmful interference
  necessity
  outer space
  peaceful use
  space heritage

  These concepts should remain visible, but their treatment must follow rather than precede the Committee's substantive choices. Express consent, standing consent, presumed consent, and deemed consent address different dimensions of consent and should not be treated as interchangeable labels. Likewise, "emergency measures" describes a possible operational or

procedural category, whereas distress and necessity are separate circumstances precluding wrongfulness under general international law, each subject to its own conditions.

21. Two controlling relationships should guide all three rounds:

- First, *space debris* should be treated as a regulatory status that may attach to a space object, not as a category detached from the treaties. Classification as debris should not by itself affect ownership, registration, jurisdiction and control, or liability.
- Second, *space debris remediation* should provisionally operate as the umbrella concept, with *active debris removal* as one modality. That structure permits the vocabulary to accommodate stabilization, passivation, relocation, deorbiting, controlled re-entry, and contactless risk reduction without treating every operation as capture and disposal.

VI The Definition Card as the Common Drafting Instrument

22. The Provisional Definitions Draft supplies the correct basic unit of work: one term, one proposed formulation, supporting documents, literature, and a note. The Definition Card should carry that structure forward rather than replace it. The existing fields become structured inputs that can be compared across terms and revised without losing their drafting history.

23. The Card should begin with two principal input modules: the preferred term, including variants and terms to avoid; and the proposed definition, including alternatives where useful. Eight analytical modules should then be completed in parallel: (i) intended legal function; (ii) binding sources; (iii) non-binding sources and practice; (iv) objective indicators; (v) adjacent terms; (vi) policy sensitivity; (vii) recommended placement; and (viii) revision history.

24. The correspondence is direct. “Documents” supplies the binding and non-binding source modules. “Literature” informs the source analysis, adjacent terms, and revision history. “Note” is disaggregated into legal function, objective indicators, policy sensitivity, placement, and unresolved issues. This treatment preserves the substance and discipline of the provisional entries while making them auditable and suitable for collective drafting.

25. The Card is not a hierarchy. Once the term and proposed definition have been entered, the analytical modules should be consulted together. A formulation that reads elegantly may still be unsuitable if it lacks a clear legal function, rests on unstable sources, cannot be applied through objective indicators, conflicts with an adjacent term, or prejudges a substantive rule.

26. Drafting conventions should be consistent. “Means” should ordinarily introduce an exhaustive definition; “includes” should ordinarily signal an inclusive clarification. A treaty-defined term should generally be incorporated by accurate cross-reference rather than silently redrafted. A

treaty-used but undefined term—such as "appropriate State" in Article VI of the Outer Space Treaty or "fault" in Article III of the Liability Convention—should be treated as an interpretive problem rather than silently restated as a new operative definition. Technical thresholds likely to change should be kept in standards, commentary, or evidentiary protocols rather than frozen in operative legal text.

27. Every Card should answer a non-prejudice question: what remains legally unchanged when the label is applied? For *space debris,* the answer includes ownership, registration, jurisdiction and control, and liability. For *debris of indeterminate registry,* later attribution remains possible. For *verified remediation,* proof of performance does not establish consent, lawful authority, or compliance with every applicable rule.

VII Interfaces with the Other Working Groups and the Full Committee

28. The Consolidated Findings Report confirms that definitions are a hinge rather than an isolated workstream. The exchange should therefore be structured around concrete dependencies and timed to avoid inviting the other working groups to redraft the entire vocabulary.[4]

29. Working Group 1 should be consulted after the first Round A cards are available. The relevant question is whether the proposed definitions fit the layered outcome under consideration—principles, high-level guidelines, and possible national implementation headings—and which terms must be operative rather than explanatory.

30. Working Group 2 should receive the cards on *authorization, debris of indeterminate registry, identified debris, launching authority, owner of a space object, remediation operator, space debris,* and *space object.* Its feedback should address the consequences required for identification, attribution, notice, consultation, consent, return, and continuing ownership, while leaving Working Group 3 to determine the most coherent definitional form.

31. Working Group 4 should receive the cards on *active debris removal, remediation operator, safety-critical data, space debris remediation,* and *verified remediation.* Its feedback should identify the evidentiary and performance predicates needed for bonds, credits, funds, insurance, ratings, certification, payment milestones, or other incentives, without converting policy proposals into definitions prematurely.

[4] Consolidated Findings Report, especially §§ 2–6 and Cross-Cutting Observations. – The Report identifies consent, layered instruments, institutional design, terminology, and incentives as interlocking strands of the Committee's work.

32. A first targeted referral can occur in November/December 2026 after Working Group 3 has completed at least one internal review of the relevant cards. Responses should be requested by a stated date and confined to three questions: which legal consequence is needed; whether the proposed scope is adequate; and whether the term conflicts with another Working Group's proposed architecture. The resulting comments should be logged in the revision history rather than absorbed anonymously.

VIII Vienna and the More Substantial Post-Vienna Program

33. The expectation for Vienna should be limited. The paper will have been circulated within Working Group 3 but will not have been adopted. It should therefore be presented only as a discussion contribution and an operational proposal. The Committee should be asked for guidance on four points: (i) the umbrella/subset relationship between remediation and active removal; (ii) the non-prejudice safeguard pursuant to Article VIII of the Outer Space Treaty; (iii) the limited first drafting sequence; and (iv) the Definition Card as the common method.

34. Vienna should not be asked to approve individual definitions. Its value lies in confirming or correcting the direction of travel. Any advice should be recorded by reference to the affected Definition Card, selection criterion, or working step, so that the post-Vienna revision is traceable.

35. Immediately after Vienna, the authors should revise this paper and circulate it to all Working Group 3 members together with a concise record of the Committee's guidance. Formal consideration as a Working Group paper should occur only after that circulation. A proposed timetable is:

- circulation of the revised paper and a concise record of the Vienna guidance by **September 7, 2026**;
- comments by **October 9, 2026**;
- a decision on the operational method and the Round A docket by **October 30, 2026**;
- first Round A Cards by **December 11, 2026**;
- second-reader reviews and group comments by **January 22, 2027**;
- revised Round A Cards and a proposed Round B docket by **February 26, 2027**;
- first Round B Cards by **April 9, 2027**;
- targeted cross-working-group comments by **May 7, 2027**; and
- a provisional consolidated drafting table by **June 11, 2027**.

These dates should be treated as planning targets that may be adjusted by agreement where the complexity of a term or the availability of members so requires.

36. Scenario-testing of completed Round A Cards should begin in March 2027 and continue through May 2027; it need not await completion of all Round B Cards. The provisional definitions should be tested against at least five scenarios: (i) removal of a registered derelict satellite with express consent; (ii) inspection and possible intervention concerning an object of indeterminate registry; (iii) a contactless risk-reduction operation; (iv) controlled re-entry with environmental and casualty considerations; and (v) mission failure or partial performance. The scenarios should test authority, attribution, notice, consent, supervision, liability, proof, and non-prejudice, not merely engineering feasibility.

37. By the end of the first mandate year, the **intended internal products** should be:

- Source Inventory #02 maintained as a living record;
- a taxonomy-and-selection matrix;
- eight to ten completed Definition Cards with alternatives where required;
- a provisional drafting table showing operative, commentary, glossary, and deferred terms; and
- an issues note identifying questions that definitions cannot lawfully resolve.

38. The controlling discipline is to define enough to reduce uncertainty, but not so much that terminology conceals disagreement, displaces treaty interpretation, or hardens temporary technology into law. An operational Phase 2 can give the Committee a stable legal vocabulary while preserving the space required for substantive rules, multilateral choice, and later technological development.

PART II — PRIORITIZED PROVISIONAL DEFINITIONS

I Purpose and Ordering Principle

39. Part II proposes a set of selected draft definitions structured by a Phase 2 ordering. The order reflects drafting readiness, not conceptual importance, and is intended to supply the Definition Card process described in Part I.

40. The first group contains terms suitable for immediate drafting or treaty-accurate cross-reference. The second group contains supporting and operational terms that may be needed in commentary, a glossary, or the second drafting round. The third group contains treaty-interpretive or policy-dependent terms that should remain visible but should not be treated as neutral definitions before the underlying legal questions have been considered.

Table 3. Prioritized drafting docket

Group	Terms	Initial treatment
A — Draft first	*active debris removal* *launching authority* *launching State* *owner of a space object* *re-entry* *space debris* *space debris mitigation* *space debris remediation* *space object* *State of registry*	Complete Definition Cards; prepare alternatives only where necessary.
B — Supporting round	*authorization* *debris of indeterminate registry* *Earth orbit* *Earth's atmosphere* *identified debris* *launch* *remediation operator* *safety-critical data* *space activities* *verified remediation*	Stabilize usage; draft if legal consequences attach; otherwise commentary or glossary.
C — Interpretive / deferred	*abandonment* *appropriate State* *consent and consent modalities (express, standing, presumed, and deemed consent)* *distress* *dual-use or dual-purpose capability* *due regard* *emergency measures* *fault* *harmful interference* *necessity* *outer space* *peaceful use* *space heritage*	Prepare source and issues notes; defer stand-alone definitions pending Committee guidance.

II Group A — First Drafting Round

41. ***Active debris removal***

Provisional formulation: **A form of →space debris remediation in which an operation intentionally changes the trajectory, orbital status, or physical disposition of existing →space debris so that it is removed from an operationally relevant orbital region or brought to a verified disposal end state.**

Drafting note: Contact and contactless methods should be addressed in commentary; mere inspection or characterization should not qualify without an intervention producing the stated end state.

Launching authority

Provisional approach: Use the definition and conditions in Article 6 of the Rescue Agreement rather than treating the expression as interchangeable with "launching State." The term is especially relevant to the return of space objects and international organizations.

Launching State

Provisional formulation: **A State that launches or procures the →launching of a →space object, or a State from whose territory or facility a →space object is launched.**

Drafting note: The definition should reproduce Article I(c) of the Liability Convention and Article I(a) of the Registration Convention without alteration.

Owner of a space object

Provisional formulation: **A State, international organization, or natural or juridical person holding title to a →space object under the applicable law.**

Drafting note: Private-law ownership should be distinguished from the State of registry's jurisdiction and control; classification as debris does not extinguish either status.

Re-entry

Provisional formulation: **The controlled, assisted, or uncontrolled return of a →space object from →outer space into the denser layers of →Earth's atmosphere.**

Drafting note: The Card should identify the legal and technical relevance of the atmospheric boundary, survival to the surface, casualty risk, pollution, and environmental effects without attempting to settle the delimitation of outer space.

Space debris

Provisional formulation: **Human-made →space objects, including fragments and elements thereof, in →Earth orbit or re-entering →Earth's atmosphere, that are non-functional.**

Drafting note: This established mitigation formulation should be accompanied by commentary on dormant, reserve, failed-but-recoverable, mission-related, and intentionally released objects, together with an express non-prejudice clause for ownership, registration, jurisdiction and control, and liability.

Space debris mitigation

Provisional formulation: **Measures intended to prevent or limit the generation of →space debris and to restrict the long-term presence of non-functional →space objects in operationally relevant orbital regions.**

Drafting note: The definition should distinguish prevention and post-mission disposal from intervention directed at existing debris, while allowing technical detail to remain in IADC, ISO, ECSS, ESA, and national standards.

Space debris remediation

Provisional formulation: **An intentional intervention concerning existing →space debris that is directed toward a measurable and durable reduction in the present or future risk posed by that debris, including stabilization, passivation, relocation, reorbiting, deorbiting, controlled →re-entry, or another verified risk-reduction measure.**

Drafting note: The definition is an umbrella concept and does not itself authorize intervention, determine consent, or allocate liability.

Space object

Provisional formulation: **An object launched into →outer space, including its component parts and its launch vehicle and parts thereof, consistently with Article I(d) of the Liability Convention and Article I(c) of the Registration Convention.**

Drafting note: The treaties provide an inclusive statement rather than an exhaustive definition; any broader formulation, including objects intended for launch, should be identified as a proposed extension and should preserve Article VIII status under the Outer Space Treaty.[5]

[5] Liability Convention, Article I(d); Registration Convention, Article I(c). – These provisions state that "space object" includes component parts of a space object as well as its launch vehicle and parts thereof; they do not otherwise exhaustively define the expression.

State of registry

Provisional formulation: **The →launching State on whose registry a →space object is carried in accordance with Article II of the Registration Convention and Article VIII of the Outer Space Treaty.**

Drafting note: The formulation should be coordinated with international organizations that declare acceptance of the relevant treaty rights and obligations.

III Group B — Supporting Terms and Second Drafting Round

42. *Authorization*

Provisional formulation: **A formal act by a competent public authority permitting a specified →space debris remediation activity subject to stated conditions.**

Drafting note: Article VI of the Outer Space Treaty establishes the obligation to authorize and continuously supervise non-governmental activities in outer space but does not define "authorization." United Nations General Assembly resolution 68/74, paragraphs 3–5, provides more specific non-binding guidance on authorization by a competent national authority, the conditions and procedures for granting, modifying, suspending, and revoking it, and continuing supervision and enforcement. This term may be defined without determining in the abstract which State is the "appropriate State" under Article VI.

Debris of indeterminate registry

Provisional formulation: **→Space debris that, after reasonable and documented efforts using available registration, tracking, mission, and ownership information, cannot be attributed with sufficient confidence to a →State of registry or other responsible →launching State.**

Drafting note: The status does not imply ownerlessness or extinction of jurisdiction and control; later attribution remains possible.

Earth orbit

Provisional formulation: **A gravitationally determined trajectory of a →space object around Earth.**

Note on the recommended placement: Technical glossary unless a later rule attaches a distinct legal consequence to a particular orbital region.

Earth's atmosphere

Provisional formulation: **The gaseous envelope surrounding Earth and retained by gravity.**

Note on the recommended placement: Glossary and technical commentary; references to "denser layers" should be tied to the specific purpose of re-entry analysis rather than presented as a general legal boundary.

Identified debris

Provisional formulation: **→Space debris that can be linked with sufficient confidence to a known →space object, mission, →owner of a space object, operator, →launching State, or →State of registry.**

Drafting note: The Definition Card should identify the evidentiary standard and distinguish physical identification from legal attribution.

Launch

Provisional formulation: **An intentional act or sequence of acts undertaken to place a →space object into →outer space.**

Drafting note: In subsequent editing, this note should address commencement, irreversibility, unsuccessful launch, and the relationship between treaty liability and national licensing definitions.

Remediation operator

Provisional formulation: **A governmental or non-governmental entity that conducts or controls a →space debris remediation operation under applicable →authorization and continuing supervision.**

Drafting note: The term should be coordinated with operator definitions in national law, mission control, contractual responsibility, and insurance arrangements.

Safety-critical data

Provisional formulation: **Data whose accuracy, timeliness, completeness, provenance, or availability is material to the safe planning, →authorization, conduct, termination, or verification of a →remediation operation.**

Drafting note: the term should be coordinated with confidentiality, security, proprietary information, and evidence requirements.

Space activities

Provisional formulation: **Activities directly related to the exploration and use of →outer space, including →launch, operation and control of →space objects, →re-entry, and the application of space science and technology.**

Drafting note: The formulation draws on United Nations General Assembly resolution 68/74, paragraph 1, as non-binding guidance on the possible scope of national regulatory frameworks. It is not a treaty definition, and its breadth should not be taken to extend the international responsibility established by Article VI of the Outer Space Treaty beyond "national activities in outer space."

Verified remediation

Provisional formulation: **→Space debris remediation whose material performance and resulting end state have been demonstrated through an auditable record and, where appropriate, independent validation against stated mission criteria.**

Drafting note: Technical verification does not establish lawful authority, consent, or compliance with every applicable rule.

IV Group C — Treaty Interpretation and Deliberate Deferral

43. ***Appropriate State***

Current provisional approach: **A State bearing international responsibility under Article VI of the Outer Space Treaty for the relevant national →space activities.**

Recommended treatment: Article VI of the Outer Space Treaty requires the activities of non-governmental entities in outer space to be authorized and continuously supervised by "the appropriate State Party to the Treaty" but does not define that State. The expression should therefore be treated as a treaty-interpretive question concerning the connecting factors by which the State or States competent to authorize and supervise the relevant national space activities are identified.

Consent modalities, emergency measures, and circumstances precluding wrongfulness

Recommended treatment: Consent and the different modalities by which it may be manifested or legally inferred should remain outside the first definitions docket. "Express consent" concerns an actual manifestation of consent; "standing consent" concerns advance or continuing applicability; "presumed consent" describes a rebuttable inference from facts or conduct; and "deemed consent" ordinarily depends on an express legal rule. These categories should not be treated as interchangeable. Any proposed "emergency measures" should also be distinguished from distress and necessity, which are separate circumstances precluding wrongfulness under general international law, each subject to its own conditions. The term "emergency intervention" should be avoided because "intervention" carries broader and potentially misleading international-law connotations. "Abandonment," "necessity" and, as the case may be, "countermeasures" likewise involve substantive rules that cannot be supplied by definitional shorthand.

Dual-use or dual-purpose capability

Current provisional approach: "Dual-use capability" may describe technology or operational capacity capable of both civilian and military application; "dual-purpose capability" may describe a system or operation deliberately serving more than one function.

Recommended treatment: Deferred security-vocabulary note. The expressions should not be treated as synonyms or as implying unlawfulness. Any later formulation should be coordinated with peaceful-use analysis, the Charter of the United Nations, security-sensitive information, and the possible military application of active debris removal capabilities, drawing on the security-vocabulary materials already included in the source inventory.

Due regard

Current provisional approach: **A duty of conduct requiring careful consideration of the corresponding interests of other States under Article IX of the Outer Space Treaty.**

Recommended treatment: Treaty commentary rather than an early operative definition, because content, standard of care, consultation, and relationship to due diligence require Committee-wide analysis.

Fault

Recommended treatment: Cross-group treaty interpretation. Article III of the Liability Convention uses fault without defining it. Any formulation would need to address standards of conduct, applicable technical standards, causation, attribution, and the relationship between State and operator conduct; it should not be drafted as a neutral term before those issues are examined.

Harmful interference

Recommended treatment: Defer a unified definition. Article IX of the Outer Space Treaty uses the distinct expression "potentially harmful interference" in connection with consultations concerning activities or experiments in outer space. By contrast, No. 1.169 of the ITU Radio Regulations and No. 1003 of the ITU Constitution define "harmful interference" specifically in relation to radiocommunication services.[6] Physical proximity, collision risk, and operational disruption do not automatically fall within that sectoral definition. These concepts should not be merged without an express legal basis.

Outer space

Current provisional approach: **The physical domain beyond Earth, including the Moon and other celestial bodies.**

Recommended treatment: Commentary only. The absence of a binding delimitation between airspace and outer space should be stated rather than concealed by a definition.

Peaceful use

Current provisional approach: Use in accordance with international law, including the Charter of the United Nations and applicable space law.

Recommended treatment: Deferred interpretive note. "Peaceful" should not be defined as either "non-military" or merely "non-aggressive" without addressing the treaty context and established debate. The related vocabulary of dual-use and dual-purpose capabilities should be treated separately.

Space heritage

Current provisional approach: **Material or immaterial evidence of human activity in →outer space having significant cultural, historical, scientific, or symbolic value.**

Recommended treatment: Deferred policy term. The legal consequences of heritage status, including consent, protection, ownership, and removal restrictions, must be determined before the category becomes operative.

V Immediate Use of Part II

44. The **Group A entries** should be transferred into full Definition Cards immediately after the operational method and first docket have been considered within Working Group 3. Each entry should be supplemented with binding sources, non-binding sources and practice, objective

[6] "Harmful interference" is defined in No. 1.169 of the ITU Radio Regulations and No. 1003 of the ITU Constitution as "[i]nterference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with Radio Regulations."

indicators, adjacent terms, policy sensitivity, recommended placement, alternatives, and revision history.

45. **Group B entries** should be activated only where the first-round cards reveal a need for operative definitions or where another working group identifies a specific legal consequence. Otherwise, they should remain in commentary or the glossary.

46. **Group C entries** should be maintained as issues notes and revisited when the Committee's substantive work supplies the rule that the definition would serve.

47. This ordering directs scarce drafting time toward terms capable of early agreement and immediate use. The resulting sequence is intended to build consensus through completed legal work rather than through abstract discussion of an unlimited vocabulary.


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