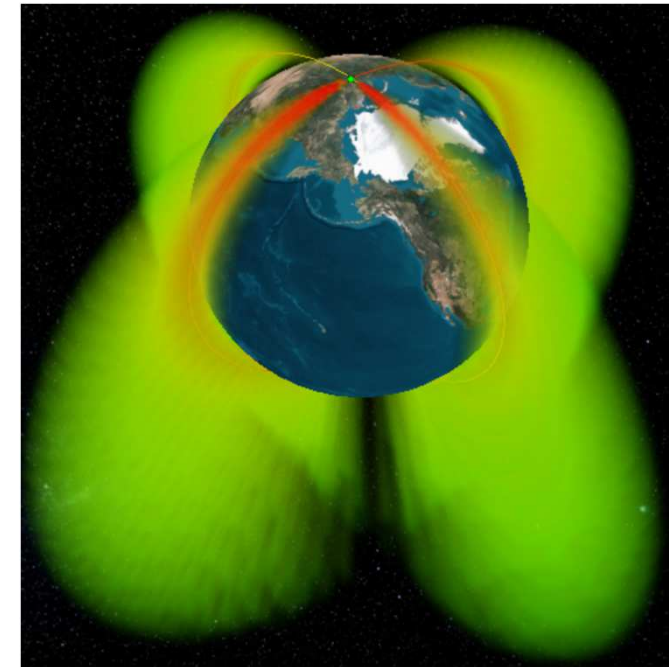


Space Safety Coalition

Dan Oltrogge

Director, AGI's Center for Space Standards and Innovation (CSSI)

IAA Space Debris Session



Iridium/Cosmos 2009



What is the Space Safety Coalition (SSC)?

- The SSC is a new ad hoc “light touch” coalition of willing space operators and relevant industry stakeholders, formed to assemble aspirational best practices for the long-term sustainability of space operations.
 - Formed just one month ago (<https://spacesafety.org>)
 - Not a legal entity
- In advance of space governance treaties, consensus guidelines, standards and national regulations, the SSC can make a difference!
 - Most operators support space sustainability
 - “It’s just good business sense”
 - Especially important for new large constellations
 - Concept is one of self-regulation
- While non-normative, signatories *endorse and agree to strive to implement* best practices to ensure safety and commercial viability of space activities.

35 space organizations endorsed this past month

Logo	Organization	Type	Endorsed on
	Airbus Defence and Space	O	16 Oct 2019
	a.i. solutions, Inc.	F	7 Oct 2019
	Altius Space Machines, Inc.	P	22 Sep 2019
	AMOS by Spacecom	O	18 Sep 2019
	Analytical Graphics, Inc.	T F	18 Sep 2019
	Astroscale Holdings	O D	18 Sep 2019
	Avanti Communications, Ltd.	O	7 Oct 2019
	AXA XL	I	18 Sep 2019
	Black Arrow Space Technologies, Ltd.	L	20 Sep 2019
	Buck Consulting Group	C	19 Sep 2019
	Centauri	C	18 Sep 2019

Logo	Organization	Type	Endorsed on
	D-Orbit	D L M O P R T	18 Sep 2019
	Effective Space Solutions Limited	D O M R	2 Oct 2019
	Equatorial Launch Australia	L	17 Oct 2019
	Geeks Without Frontiers	A	18 Sep 2019
	Hellas Sat	O	18 Sep 2019
	Inmarsat	O	18 Sep 2019
	Intelsat S.A.	O	18 Sep 2019
	International Association for the Advancement of Space Safety	A	16 Oct 2019
	Iridium Communications Inc.	O	18 Sep 2019
	Loverro Consulting LLC	C	18 Sep 2019
	Maxar Technologies	O	18 Sep 2019
	OneWeb	O	18 Sep 2019
	Phase Four, Inc.	P	16 Oct 2019
	Planet Inc.	M O	18 Sep 2019

Logo	Organization	Type	Endorsed on
	Providence Access Company	C	18 Sep 2019
	Rocket Lab USA Inc	L	18 Sep 2019
	Secure World Foundation	A	18 Sep 2019
	SES S. A.	O	18 Sep 2019
	SJE Space Ltd.	C	24 Sep 2019
	Sky and Space Global	M O	18 Sep 2019
	Space Initiatives Inc.	M O	18 Sep 2019
	Space Data Association Ltd.	A F	18 Sep 2019
	Virgin Orbit	L O	18 Sep 2019
	XTAR LLC	O	18 Sep 2019

Legend: Entity Type

A=Association/Foundation	C=Consulting/Analytical Serv.	D=Disposal services
F=Flight safety/SSA/STM	G=Govt Operator	I=Insurer
L=Launch provider	M=Manufacturer of spacecraft	O=Operator (commercial)
P=Part/comp manufacturer	R=RPO/OOS services	T=Systems/Tools supplier

What is SSC's “Best Practices for the Sustainability of Space Operations” ?

- **A ground-breaking “living” best practices document that:**
 - **Part 1:** Endorses existing international guidelines and standards ([IADC](#), [UN](#), [ISO](#))
 - **Part 2:** Contains **over forty additional specific best practices** to further enhance and secure the long-term sustainability of space operations
 - Initially motivated by perceived unpreparedness for NGSO large constellations
 - Developed by thirty six space operators and relevant industry stakeholders
- **Spans all phases of design and spaceflight, orbit regimes, spacecraft form factors, life cycle phases, and mission types**
- **Although non-normative, signatories “endorse and agree to promote and strive to implement” these best practices to preserve the space operations environment for current and future generations.**

SSC best practices: Highlights of Part I

- **Endorsement of and planned adherence to current international best practices and standards, to include:**
 - IADC guidelines for international space debris mitigation
 - UN COPUOS guidelines for international space debris mitigation
 - Including 2019 UN consensus LTS guidelines
 - ISO TC 20/SC 14 24113: “Space Systems - Space Debris Mitigation”
 - CCSDS international standards (typically co-published with ISO)

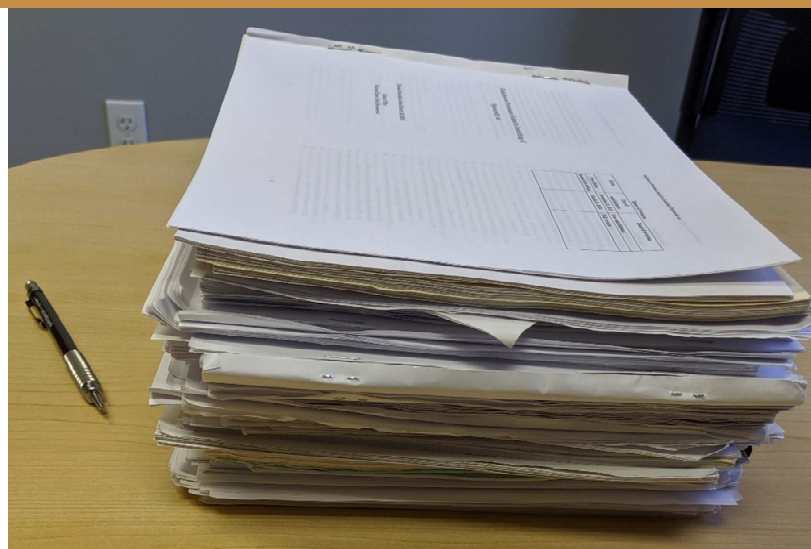
Space Safety document: Highlights of Part II

- **Endorsement of over forty additional best practices not captured in current IADC, UN or ISO documents that are seen as critical to maintaining safe space operations in all orbital regimes (both NGSO and GSO), including:**
 - Operator exchange of information relevant to safety-of-flight and collision avoidance with other space operators and stakeholders in accordance with each operator's country export regulations;
 - Satellite operator selection of launch vehicles with due consideration of sustainability of the space operating environment;
 - Responsible mission and constellation design to prioritize space safety for spacecraft & constellations;
 - Commitment to spacecraft designs that facilitate successful disposal (striving for a probability of successful disposal of 95%), actively avoid collisions, minimize casualty risk, mitigate risk of post-mission fragmentation, ensure sensor trackability and facilitate spacecraft servicing and removal;
 - Commitment to space operations that actively avoid collisions, properly passivate satellites either upon end-of-mission or after a suitable active collision avoidance phase has been completed, dispose the satellites within 5 years of end-of-mission for manoeuvring spacecraft and maintain accurate spacecraft positional knowledge.



<https://www.pexels.com/@ollivves>

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The wave-top view: Industry initiatives and best practices in the larger context



AIAA STM Task #3 Preliminary Space Governance Characterization

	United Nations				International NGOs						National Regulatory						Industry Consortia										
	UN COPUOS (Treaties)	UN COPUOS (Excl. Treaties, SDM & LTS Guidelines)	United Nations Space Debris Mitigation Guidelines	United Nations Long Term Sustainability Guidelines	Committee on Space Research (COSPAR)	Consultative Committee for Space Data Stds	Inter-Agency Debris Coordination Committee	Intl Assoc for Adv of Space Safety (IAASS)	Intl Organization for Standardization (TC20/SC14)	International Telecommunications Union (ITU)	Canada	EU	France	Japan	South Africa	UK	USA Commercial	USA NASA	USA USAF	AIAA	Association of Space Explorers (ASE)	CubeSat Standard (Cal Poly)	Consortium for Execution of RPO & OOS (CONFERS)	Satellite Industry Association (SIA)	Space Data Association (SDA)	Space Safety Coalition (SSC)	World Economic Forum
Normative? (●=Y ○=N ●=Mix)	●	○	○	○	○	●	○	○	●	○	●	●	●	●	●	●	●	●	●	○	○	○	○	○	○	○	○
Capacity building																											
Casualty risk																											
Contamination (physical)																											
Contamination (radiation)																											
Contamination (RFI)																											
Cooperation, inclusiveness																											
Exchange of space data																											
Health & status																											
Jurisdiction & ownership																											
Moon & celestial bodies																											
Registration																											
Responsibility/Liability																											
RPO/OOS																											
Safety																											
Security																											
Space law																											
Space weather effects																											
SSA																											
Standardization																											
TCBMs																											

Learn how to promote space safety and long-term sustainability of space operations at: <https://spacesafety.org> or email us at info@spacesafety.org

Best Practices for the Sustainability of Space Operations

