



Space Safety – Why Does It Matter and What Should We Do About It?

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WALT EVERETTS AND IRIDIUM

- Walt Everetts: VP of Space and Ground Services
 - With Iridium since 1995.
 - Background in satellite design, manufacturing, integration and testing. Now focused on operations of space and ground networks.
- Iridium led the charge for low latent, reliable, truly global space-based communications to enable new services & business to be developed.
- “Big-LEO” was uncharted territory in the 90’s. Regulatory efforts unknown.
- No actionable data existed for a commercial owner-operator prior to 2/10/09. Everything in the public domain incapable to make maneuver decisions.
 - Iridium 33/Cosmos 2253: 14th most likely of Iridium conjunction
 - Iridium 33/Cosmos 2253: ~70th most likely of traceable objects

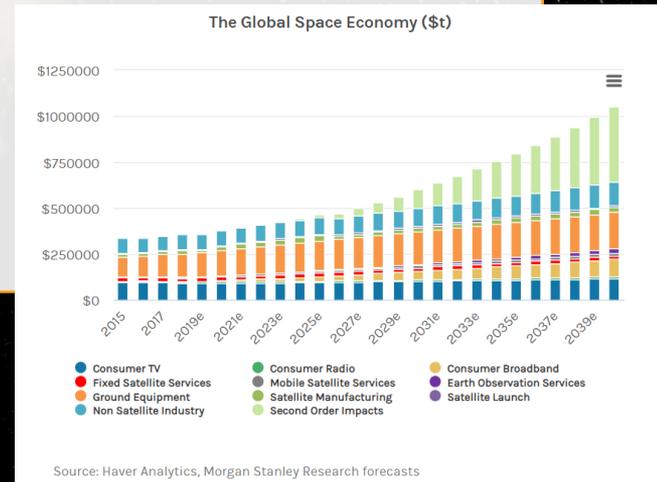
Why is this important? What has changed? What should we do?

WHY IS THIS IMPORTANT? THE ECONOMIES OF SPACE

- Space Foundation valued the global space economy at \$469B in 2021, which represents a 4.9% annual increase.
- YoY space spending jumped by the largest amount since 2014.
- Morgan Stanley estimates that the global space industry could generate revenue of more than \$1 trillion or more in 2040

Space Market segmentation and 'value chain'

- The space infrastructure supply – the Upstream
- The space infrastructure demand - the Midstream
- The induced markets – the Downstream



WHAT SHOULD WE DO ABOUT IT?

Responsible space behavior is necessary

- Current & future space actors must use responsible space behavior to ensure space accessibility for capabilities dependent on a space ecosystem
- Rules of the Road, guidelines, regulations, policies all have a place in “enforcement” of the use of space, but it really boils down to, in my opinion, the need for all space actors to be Responsible, Transparent, Cognizant.

Be Responsible, Act Responsibly

Each owner/operator (O/O) must be responsible for their space assets and remain cognizant of the shared space we all must utilize

Contribute, Challenge, Learn

The industry of Space Situational Awareness (SSA) has grown along with the increased utilization of space. Space 2.0 will require additional knowledge of the operations teams. Resources are there – use them

People, Policy, & Procedures

SSA isn't easy and it isn't (necessarily) hard and there are many resources that are available to assist an O/O with developing safe space domain capabilities

Share

Know your neighbors and be transparent- attend conferences, sign SSA sharing agreements, support the development of technology enhancements and best practices

Deorbit & Demise

Plan for end-of-life disposal of space assets – there are established ways and new ways being developed that can be part of any constellation planning

IRIDIUM & RESPONSIBLE BEHAVIORS IN SPACE

- In 2009, an abandoned, uncontrolled satellite crashed into one of Iridium's active communication satellites. [\(The Cloud\)](#)
- This event served as a wake-up call for the industry to improve information-sharing on the orbit of satellites and debris. Thanks to greater industry collaboration, today satellites can operate safer than ever, with new practices to prevent future collisions. [\(The Silver Lining\)](#)
- Iridium maintains close & constant communication with appropriate commercial, civil and governmental entities. This includes information sharing & transparency on position, maneuvers and our deorbit effort [\(The Process\)](#)
- Enhanced mitigation & maneuvering abilities, sharing of best practices coupled with procedures to de-orbit satellites at their end-of-life are real world examples used to help prevent additional debris from congesting space. [\(The Results\)](#)

THE RACE TO SPACE NEEDS TO INCLUDE THE RESPONSIBILITY TO DEORBIT

Iridium Deorbit Program

Early in the Iridium® NEXT replacement program, Iridium determined that space sustainability was dependent upon safely executing a deorbit program including:

Satellite Capability
Operations
Cooperation

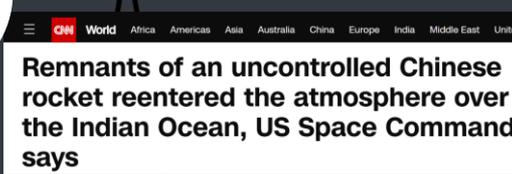
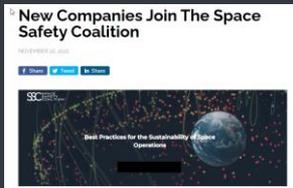
By the Numbers

More than **33,000 kg** of debris removed from space

Only **19** days on average from passivation to re-entry!

Replaced with **75** second-generation satellites, successfully conducting the largest space-based technology refresh in history

THE CURRENT STATE OF AFFAIRS: THE SCALES OF SPACE SAFETY



AIAA, Iridium, OneWeb, SpaceX Release "Satellite Orbital Safety Best Practices" Reference Guide
Written 8 September 2022



SPACENEWS
Australia joins ASAT test ban, raising like-minded countries to eight

- ASAT ban ✓
- Net Zero Space Initiative ✓
- 5-year EOL disposal requirement ✓
- Sharing Best Practices ✓

- Uncontrolled reentry ✗
- Threats to impact space ✗
- ASAT testing ✗

LESSONS LEARNED

“ We are committed to using space for our operations and then leaving it as we found it by properly deorbiting and disposing of our constellation as we replace it.



The new 5-year EOL disposal requirement is clearly achievable.

Being transparent in regard to intention and execution helps ensure safety of all space assets.

Satellite end-of-life disposal should start in the vehicle design phase, and a deorbit program must be defined.

We must stop creating issues, debris, threats & challenges to ensure space access remains unfettered



Questions?

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