



Accidents in Space Floating in a Legal Limbo?

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Two Scenarios

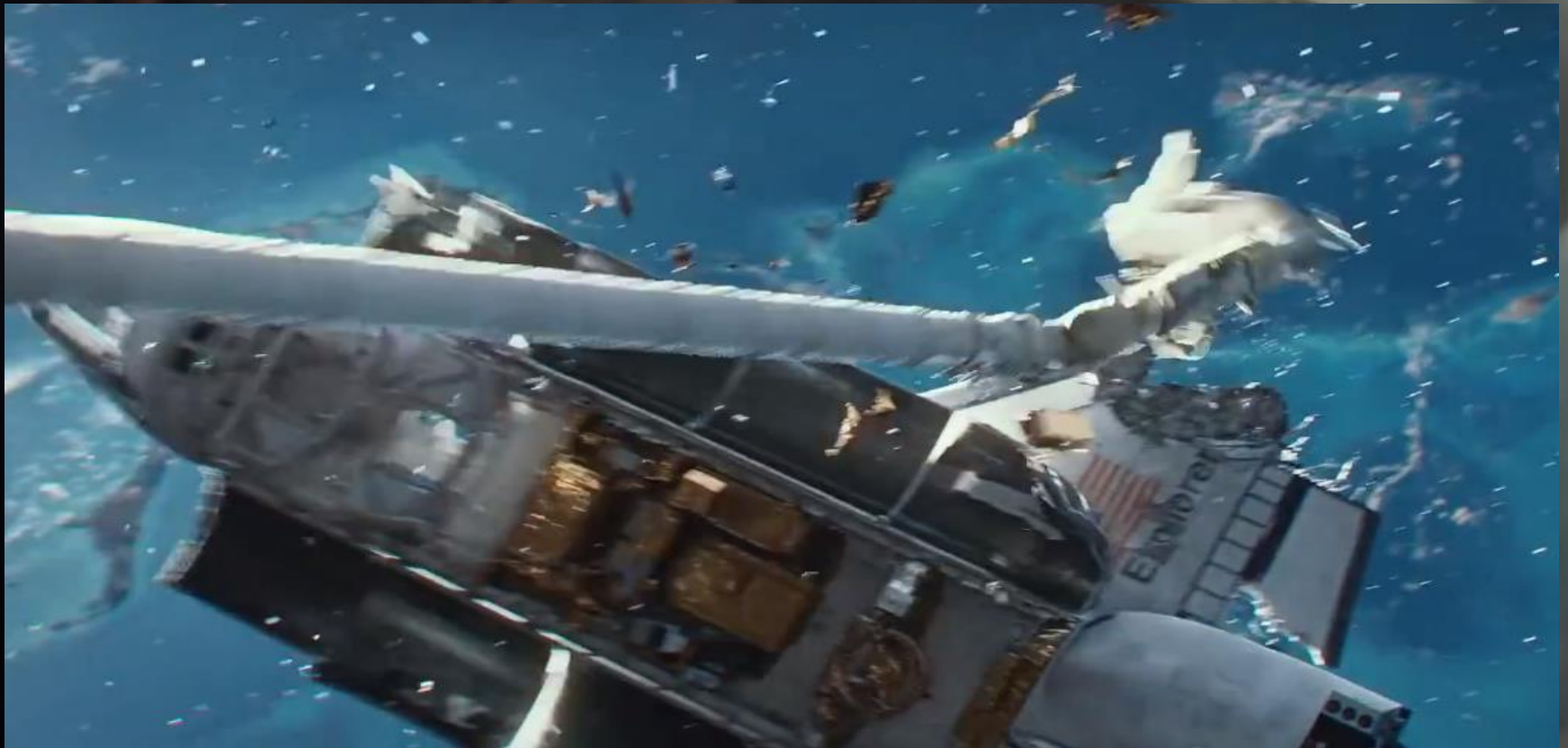
Fiction--Gravity Movie:

- Debris destroys space assets
- Massive uncontrollable orbiting fragments
- Humans in peril
- Drama in space with
- Lots of action and destruction
- Rescue always possible

Possible Real Incident and Legal Resolution:

- Debris destroys space asset
- Massive uncontrollable orbiting fragments
- Valuable objects in peril
- Loss of major communications link and economic losses
- Switch to courtroom
- Perry Mason (or perhaps William Shatner--Boston Legal and Star Trek) wins trial where the
- Perpetrator of the accident is liable for all damage

Perception: Space is Crowded With Debris
Reality: It is still vast and open; even
the astronauts in Gravity were not hit!



Historical Odds

- Loss of satellite on launch $\approx 8\%$
- Loss of satellite 1st year in orbit $\approx 6\%$
- Loss of satellite after 1st year $\approx 2\%$
- Loss of satellite from direct collision $\approx 0\%$
- Kessler effect = hasn't occurred yet
 - If it occurs, where are the risks highest?

Economic Losses?

- Most valuable satellites
 - New (not yet depreciated)
 - GEO (largest and most expensive satellites and launches—only about 200 of 400 active insured)
 - One of a kind government missions
- Insured—many are not
 - GEO: 185 satellites; \$26 Billion
 - LEO: 20 satellites; \$1.5 Billion
- Major reasons for insurance claims
 - Launch vehicle failures
 - Electric power failures during operation of satellite
- Is the real economic loss the hardware in space or the availability of services terrestrially?

Q & A

- Why is a company willing to take on such high risks of a total economic loss
 - Because the resulting life cycle profits from extended operations outweigh the risk
 - Clearly, the loss from an accident or debris is currently considered a low additional risk
 - Lack of on-orbit insurance another indicator of willingness to take risk
 - Or, is it because the damages themselves would be of minimal value?
 - Loss of satellite—depreciated value, no salvage anyway?
 - Loss of service—are spares/backup available?
- Or, is it because proving “fault” is almost impossible and no compensation (payouts for the owner of the asset or insurance company) would be awarded in lawsuit

Some Legal Hurdles

- Definitions
- Resolving future disputes in space

Definitions

- U.N. Sustainability Working Group, Subgroup D emphasized the need for clear definitions
- Glossary a beginning of the process
- Will eventually need judicial decisions
- But, may be specific to specific situations
- Caution: Importing definitions from analogous situations such as UNCLOS or environmental cases

Examples

- Fuzzy definitions (from treaty language)
 - Space object
 - International responsibility and liability
 - Jurisdiction and control
 - National activities
 - Duty of care/due diligence/negligence
 - Damages

Resolving Disputes

- We have been lucky so far—no accidents with serious economic consequences
- Enforcement of Int'l. Court decisions not guaranteed
- Most focus has been on “before-the-fact” minimization of debris
 - UN IADC Mitigation Guidelines
 - Proposed Code of Conduct

Encouraging Sustainability

- Lacking: after-the-fact processes
 - Resolving disputes for accidents in outer space
 - Diplomatic Negotiations
 - Claims Commission (as per Liability Convention)
 - Other court proceedings, including the ICJ
 - None are ideal for commercial interests
- Why is this important now?
 - Penalties for bad behavior act as incentives for good behavior, and
 - The knowledge that penalties will be enforced is just as much an incentive to manage debris and sustainability as is before-the-fact “soft law”

Addressing the Issue Before the Big Accident Occurs

- If we wait there will be no agreement possible since parties have too much to lose
- Commercial world has workable systems
- Governments must agree to be bound by decisions
- National Laws, therefore, are the key and
- Before-the-fact binding agreements should be part of the licensing process
- International treaties can wait, but they would be very helpful in providing uniform guidelines.

Additional Issues

- Roadblocks to change may be more technical and geopolitical than legal
 - Better situational awareness information and joint/cooperative “traffic management” systems
 - General agreement of space-faring nations on approaches to alternate dispute resolution