Presentation Topics

- Risks of Space Debris to Civil Aviation
- Limitations of Ground-Based Safety Standards
- Challenges in Predicting and Responding to Re-Entries
- Overlapping Legal Regimes
- Mitigating Risks through Controlled Re-Entries
Risks of Space Debris to Civil Aviation

- Space debris from satellites, stage re-entries, and on-orbit collisions pose physical impact risks to aircraft
- Debris can penetrate critical aircraft structures or be ingested by engines
- Uncontrolled re-entries make it difficult to predict where debris will re-enter and mitigate risks to aviation
Limitations of Ground-Based Safety Standards

• Current ground safety standards do not adequately address the unique risks to aircraft.

• Debris characteristics that endanger people on the ground differ from those that threaten aircraft.
Challenges in Predicting and Responding to Re-Entries

• Tracking and predicting re-entry locations is inaccurate and variable

• Public re-entry information is not actionable for airspace users

• Closing large airspace volumes is impractical, so re-entry predictions only serve as safety advisories
Overlapping Legal Regimes

• The Chicago Convention governs civil aviation safety

• The Outer Space Treaty establishes the framework for international space law

• ICAO’s role is to integrate commercial space operations into the airspace system
Mitigating Risks through Controlled Re-Entries

- Targeted, controlled re-entries in remote areas can reduce risks to civil aviation

- Requiring reliable deorbit systems on satellites could dramatically lower casualty expectations

- Using technology to direct re-entering debris to the safest airspace regions can increase aviation safety
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