# delete

## Daniel Topa daniel.topa@hii.com

# Huntington Ingalls Industries Mission Technologies

December 28, 2024

## Contents

	Introduction			
	1.1	Overview of the Problem	1	
	1.2	Objectives	1	
	1.3	Methodology	1	
2	Bac		2	
	2.1	A	2	
	2.2	B	2	
	2.3	C	2	
$\mathbf{R}$	References			

# 1 Introduction

#### 1.1 Overview of the Problem

This subsection provides a detailed description of the problem or challenge being addressed in this document.

## 1.2 Objectives

This subsection outlines the main objectives of the document, including key research goals or development targets.

#### 1.3 Methodology

This subsection describes the methodology or approach taken to address the problem and achieve the objectives.

## 2 Backup

#### 2.1 A

First subsection.

#### 2.2 B

Second subsection.

#### 2.3 C

Third subsection.

### References

- [1] Yasir Ali, Fizza Hussain, and Md Mazharul Haque. "Advances, challenges, and future research needs in machine learning-based crash prediction models: A systematic review". In: *Accident Analysis & Prevention* 194 (2024), p. 107378. ISSN: 0001-4575. DOI: https://doi.org/10.1016/j.aap.2023.107378.
- [2] Inc. (AGI) Analytical Graphics. Iridium 33 Cosmos 2251 Collision. https://web.archive.org/web/20100514075852/http://www.agi.com/media-center/multimedia/current-events/iridium-33-cosmos-2251-collision/default.aspx. Archived link accessed: 2024-12-25. Includes videos, 3D models, and interactive tools for understanding the event. Feb. 2009.
- [3] Anonymous. Analysis of Orbital Debris Impact Risks. Tech. rep. Accessed: 2024-12-25. United States Department of Energy (DOE), Oct. 2009.
- [4] Anonymous. "Analysis of Debris from the Collision of the Cosmos 2251 and the Iridium 33 Satellites". In: *Science & Global Security* 18.2 (2010), pp. 87–118. ISSN: 0892-9882. DOI: 10.1080/08929882.2010.493078.
- [5] Anonymous. Satellite Collision Modeling with Physics-Based Hydrocodes: Debris Analysis. Tech. rep. Accessed: 2024-12-25. United States Department of Energy (DOE), Aug. 2010.
- [6] Ulpia Elena BOTEZATU. "Developing a comprehensive Combat Mindset for outer space security". In: Redefining Community in Intercultural Context 11.1 (2023), pp. 43–52.
- [7] Keir Clarke. Satellite Crash. Vimeo video. A Google Earth Browser plug-in simulation of the Iridium 33 and Cosmos 2251 satellite collision. Accessed: 2024-12-25. 2009.
- [8] Rachel Courtland. "Satellite crash prediction is plagued with uncertainty". In: New Scientist (2009). Accessed: 2024-12-25.
- [9] Ram S Jakhu. "Iridium-Cosmos collision and its implications for space operations". In: Year-book on Space Policy 2008/2009: Setting New Trends (2010), pp. 254–275.

- [10] Adam P Jodice and Mark R Guerber. "Space combat capability... do we have it?" In: Air & Space Power Journal 28.6 (2014), pp. 82–99.
- [11] Nicholas Johnson. "The Collision of Iridium 33 and Cosmos 2251: The Shape of Things to Come". In: *Proceedings of the 60th International Astronautical Congress*. Work of the US Government. Public use permitted. NASA Johnson Space Center. Seoul, Korea, Republic of, Oct. 2009, pp. 1–5.
- [12] Donald J Kessler and Burton G Cour-Palais. "Collision frequency of artificial satellites: The creation of a debris belt". In: *Journal of Geophysical Research: Space Physics* 83.A6 (1978), pp. 2637–2646.
- [13] Michael Listner. *Iridium 33 and Cosmos 2251 three years later: where are we now?* https://www.thespacereview.com/article/2023/1. Accessed: 2024-12-25. Analysis of the long-term effects and current status of debris from the 2009 satellite collision. Feb. 2012.
- [14] Israel Lopez and Nesrin Sarigul-Klijn. "A review of uncertainty in flight vehicle structural damage monitoring, diagnosis and control: Challenges and opportunities". In: Progress in Aerospace Sciences 46.7 (2010), pp. 247–273.
- [15] Paul Marks. "Satellite collision 'more powerful than China's ASAT test'". In: *New Scientist* (Feb. 2009). Accessed: 2024-12-25.
- [16] Jonathan C. McDowell. Jonathan's Space Report No. 606. http://host.planet4589.org/space/jsr/back/news.606. Covers Iridium 33/Cosmos 2251 collision and other significant space events. Archived at https://web.archive.org/web/20170405123635/http://host.planet4589.org/space/jsr/back/news.606. Accessed: 2024-12-25. Feb. 2009.
- [17] Martha Mejía-Kaiser. "Collision Course: The 2009 Iridium-Cosmos Crash". In: Proceedings of the 52nd IISL Colloquium on the Law of Outer Space. Posted: 21 Mar 2019, Accessed: 2024-12-25. Examines legal, political, and liability implications of the 2009 satellite collision. International Institute of Space Law. Daejeon, Korea, Oct. 2009, pp. 87–118.
- [18] NASA Johnson Space Center Orbital Debris Program Office. "Orbital Debris Quarterly News, Volume 15, Issue 3". In: Orbital Debris Quarterly News 15.3 (July 2011). Accessed: 2024-12-25.
- [19] "Satellite Collision Leaves Significant Debris Clouds". In: Orbital Debris Quarterly News 13.2 (Apr. 2009). Accessed: 2024-12-25.
- [20] Primal Space. The Power of Space Debris. YouTube video. Accessed: 2024-12-25. 2024.
- [21] Space-Track.org. Space-Track.org. https://www.space-track.org/. Accessed: 2024-12-25. 2024.
- [22] SpaceNews Editorial Team. 10 breakups account for 1/3 of cataloged space debris. SpaceNews. Accessed: 2024-12-25, original URL no longer active. Apr. 2016.
- [23] SpaceWeather.com Editorial Team. Fireball Mania: Colliding Satellites Iridium 33 and Cosmos 2251. https://spaceweather.com/glossary/fireballmania.htm. Accessed: 2024-12-25. 2009.

- [24] CelesTrak Team. Iridium 33/Cosmos 2251 Collision. http://celestrak.com/events/collision.asp. Coverage started March 5, 2009. Updated March 11, 2009. Accessed: 2024-12-25. 2009.
- [25] CelesTrak Team. Iridium 33/Cosmos 2251 Collision. https://celestrak.org/events/collision/. Accessed: 2024-12-25. 2009.
- [26] Edward B Tomme. The paradigm shift to effects-based space: Near-space as a combat space effects enabler. Airpower Research Institute, College of Aerospace Doctrine, Research and ..., 2005.
- [27] Ting Wang. "Analysis of Debris from the Collision of the Cosmos 2251 and the Iridium 33 Satellites". In: Science & Global Security 18.2 (2010), pp. 87–118.
- [28] Wikipedia contributors. 2009 Satellite Collision. https://en.wikipedia.org/wiki/2009\_satellite\_collision. Accessed: 2024-12-24. 2024.
- [29] David Wright. Colliding Satellites: Consequences and Implications. Union of Concerned Scientists Report. Accessed: 2024-12-25. Feb. 2009.