



QSC Case Competition 2019

Background Info

Space junk is becoming an increasing problem in our world today and is likely to get much worse in the near future. Space junk is the colloquial name for man-made material and objects that continue to orbit the earth and consists mostly of decommissioned satellites, rocket boosters, and nuts and bolts. In January of 2018, the European Space Agency estimated that there are around 29,000 pieces of space junk larger than 10 centimetres, 750,000 objects between 1 centimetre and 10cm, and around 166 million objects between 1 millimetre and 1 centimetre in size [1]. While many of these pieces of space junk are small, pieces of space junk can travel up to 8 kilometres per second meaning that even an object the size of a marble can wreak havoc on a satellite or spaceship [1].

The problem is already serious but will undoubtedly get worse. Space X alone plans to send around 12,000 objects up into space over the coming years and many of these satellites are so small that they do not have their own propulsion system and thus cannot deorbit alone [2].

NASA's Orbital Debris Program Office has set a recommendation of a 'self-destruct' timeline of 25 years for all satellites and objects sent into space [2]. The problem is that no country has to enforce this guideline. As well, the issue of climate change is making problems worse. Research suggests that the addition of carbon dioxide into the atmosphere is contracting it and reducing drag on space junk and thus allowing debris to travel faster in the atmosphere [2].

Your Task

Your task is to develop a plan to target and remove space junk from the upper atmosphere. The proposed system/solution must be able to target dangerous objects and remove them but the targeting and removal systems do not have to be combined as one. To go above and beyond, briefly suggest a policy to prevent the build-up of space junk in the future. Suggest reasons why companies and countries would be willing to comply with a policy to remove unused objects they sent into space or why they should limit sending objects into space despite potential cost they may face doing so.

Presentation

Each group will have 8 minutes to share their PowerPoint presentation, demonstrating to the judges why their solution is the most practical. Feel free to make the presentation as creative as you wish with the resources available to your group. Highlight all of the key points outlined on the next page in the marking scale during your presentation.

Please email your presentation to m.rivard@qsconference.com no later than 12:45 before your presentation.

[1] S. R. Choudhury, "Space junk is a big problem and it's going to get worse," 18 September 2018. [Online]. Available: <https://www.cnbc.com/2018/09/18/wef-tianjin-space-junk-is-a-big-problem-and-its-going-to-get-worse.html>. [Accessed 2018].

[2] S. Scoles, "The space junk problem is about to get a whole lot gnarlier," 31 July 2017. [Online]. Available: <https://www.wired.com/story/the-space-junk-problem-is-about-to-get-a-whole-lot-gnarlier/>. [Accessed 2018].





Marking Scale

Team Name:

Practicality

Is the system or idea proposed likely to work effectively at targeting and removing debris from orbit? Is the proposed policy proposed likely to be effective and is it likely countries will be inclined to enforce it?

1 2 3 4 5 6 7 8 9 10 11 12
Does not meet criteria Exceeds expectations

Creativity

Taking an alternative approach to the problem. Developing a new solution that may have practical applications.

1 2 3 4 5 6 7 8
Does not meet criteria Exceeds expectations

Economic Viability

Does the project seem to be within a reasonable budget? The solution should attempt to be as economically feasible as possible.

1 2 3 4 5 6
Does not meet criteria Exceeds expectations

Presentation

Were the speakers engaging and informative? Did the presenters maintain eye contact with the audience and did they clearly define their solution? Was the total presentation time 7 minutes or under?

1 2 3 4 5 6 7 8
Does not meet criteria Exceeds expectations

Total Score /34

