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AIRBUS ACTIVE DEBRIS REMOVAL SERVICE

Abstract

Airbus Active Debris Removal Service

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1 Introduction

With the increasing number of both functional and defunct space assets being present in orbit; and having a better understanding of the space environment, it is clear that there is a need for Active Debris Removal (ADR) today if not in the very near future. Airbus are working towards creating an ADR service with the aim of being both technically feasible and at an attractive price point to potential customers.

In 2018 Airbus demonstrated ADR technologies for the first time in-orbit through the RemoveDEBRIS mission. This mission, co-funded by the European Commission and produced by multiple partners, demonstrated the use of a visual based navigation system to detect and track a free-flying tumbling object (Airbus Toulouse), a harpoon (Airbus Stevenage) and net (Airbus Bremen) to capture a target, and a drag sail to de-orbit the spacecraft. Airbus have also worked extensively on other projects to develop the capability to rendezvous and capture objects in space (such as the ATV and Space Tug). These technologies are key building blocks for Airbus to provide both ADR and in-orbit servicing to the market.

2 Airbus ADR Developments

For an ADR service to be successful it must have the capability to track and rendezvous with an uncooperative target, in most cases the target is in a tumbling motion. Airbus have developed the capability to use on-board sensors to assess the target motion, characterise whether capture is possible, and manoeuvre the chasing satellite for capture. After securing the target the altitude of the stack is reduced such that the target will naturally de-orbit within 5 year. The target is released and further targets are captured and lowered.

Following on from RemoveDEBRIS, Airbus have been working with agencies and industry to develop a reliable and affordable ADR service. All aspects are being assessed, from technical feasibility and concept of operations to the business case and pricing model.

3 Conclusion

In the paper the ADR technologies developed by Airbus will be discussed in more detail with information on when they might come to market. It will also discuss the risks associated with ADR and how Airbus plans to mitigate these.