

WHAT ROBOTICS CAN DO FOR INSURERS

3rd April 2019

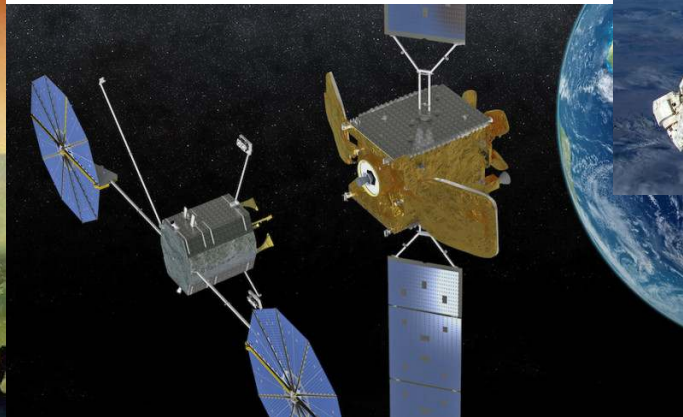
3rd PERASPERA workshop

Plan the European Roadmap and its Activities for Space
Exploitation of Robotics and Autonomy



SPACE ROBOTICS?

Chris Foss ?
or
Mission Extension Vehicle ?
or
Canadarm II ?



WHAT IF WE COULD?

- Let's call it robotics if it allows us to assemble, integrate, test, repair, maintain, salvage...
- Most relevant to insurers is the interaction with operational assets after they have been delivered, i.e. repair, maintain, salvage.
- Clearly, repairing spacecraft could be cheaper than paying for a new one.
- We may also want to inspect to learn from failures and how to avoid them reoccurring.



... SAVE A LAUNCH FAILURE?

- Launch failures occur half a dozen times each year.
- Can a rescue mission get to the orbit of the stricken satellite before it decays? (Half the launch failures never enter orbit.)
- Can the rescue mission provide the required delta-V for orbit raising?
- Will satellites survive prolonged orbit raising?
- Potential annual 'market value': 2-300 MUSD



... FIX A BODGED DEPLOYMENT

- Solar Arrays, antenna reflectors, aperture covers... other mechanisms.
- These happen relatively rarely, less than once a year. However, they can be critical. Total insurance losses over the last 20 years roughly 1.2 BUSD
- Total data above represent both 'stuck' and 'broken', so the actual 'repairable' events are roughly half of the above.
- Potential Annual 'market value': 20-30 MUSD



... RESTORE LOST POWER

- Sadly, a much more common occurrence.
- Around 150 insurance related events over the last 20 years, for a total loss of around 4.5 BUSD
- However, failures in the Solar Array Drive Mechanism, battery cells, regulation and distribution units etc. are difficult to repair – high power short circuits would need complex repair operations.
- PVA and some external harness issues could potentially be easier to repair ‘externally’?
- Potential Annual ‘market value’: 150-200 MUSD (difficult!)



... FIX A FAILED PROPULSION SYSTEM

- These occur roughly once per year, with roughly 1 BUSD of insured losses over the last 20 years.
- In principle, these can be 'easily' repaired by a mission extension vehicle or similar, assuming that the failure mode did not leave the satellite out of control.
- Potential Annual 'market value': 50 MUSD



... WOULD IT BE WORTH IT?

- Previous pages sum up to annual market potential i.r.o. 500 MUSD.
- Annual repairable events possibly 3-4?
- NB: These are 20 year averages – significantly lower recent losses 😊
- Much of this would be power systems – technically very challenging.
- A business plan would need to be resilient to ‘good’ in-orbit experience; there would be no guaranteed income.
- The commercial landscape around insurance claims is difficult; the operator (and their banks!) would prefer their claim to be paid without potentially waiting for a (risky?) rescue. Insurers are unable to fund a rescue...



MORTEN PAHLE

Managing Director

M: +44 (0) 7983 531 161

E: morten.pahle@volanteglobal.com

VOLANTE
GLOBAL

AESIR
SPACE

a member of the Volante Global Group of Companies

Copyright © Volante International Limited 2019.

Aesir Space is a trading name of Volante International Limited ("VIL") a company incorporated under the laws of England & Wales with registered number 11005928 and whose registered office is 20 St Dunstan's Hill, 5th Floor, London, EC3R 8HL. VIL is an Appointed Representative of Vibe MGA Management Ltd which is authorised and regulated by the Financial Conduct Authority.

This document, the presentation to which it relates and all data, information and all other contents or materials contained in it were intended and prepared for general information and discussion purposes only, and do not create any obligations on the part of VIL, its parent, subsidiary or affiliated undertakings.