

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems Verification and In-Flight Experimentation (6)

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THE NEED FOR ON ORBIT VERIFICATION (OOV)

Abstract

The Need for On Orbit Verification (OOV)

On Orbit Verification (OOV) or In Orbit Demonstration (IOD) etc. turns out to be an important institution to bring forward technologies and thereby ensuring an advance in technology. In recent times as well as today many projects or experiments to experience space conditions were finished without significant tests, mostly because of lacking budgets or a lack of spaceflight opportunities. So the development of technologies was cut. They are captured in the “valley of death”, that means on a TRL (Test Readiness Level) around TRL 5. Other needs are to bring hardware to space, which is already developed and qualified terrestrial to TRL 8. For companies TRL 9 means qualified for use in space. This is essential for those companies to be competitive in their business.

Today terrestrial testing is a common procedure. There are different test facilities to test a wide range of requirements mechanically, electrically, in terms of radiation, thermal, etc. Other facilities can provide almost zeroG environment, eg. the drop tower in Bremen, Germany, sounding rockets like the TEXUS and MAXUS experimental flights in Scandinavia, performed by ESA and DLR or using zero-G flights on special aircrafts. These facilities should be another step towards qualification.

But how can experimental payload transported to an Orbit? One example to find flight opportunities was the German TET 1 Satellite (“Technologie- Erprobungs- Träger” - “Technologies Experimental platform”). Different payloads were assembled on one platform and successfully flown in space. The satellite was built in the frame of the OOV-Program of DLR-Space Administration. Of course, there are more programs like ESAs Proba missions, dedicated missions even to GEO like the SGEO or the Heinrich HERTZ- Satellite. More flight opportunities can be provided by satellites, the ISS, Soyuz Interstage, small companies to provide launch opportunities.

The EU (European Union) is investigating the possibilities of In-Orbit Demonstration (IOD) missions by identifying and down-selecting a portfolio of missions through assessing the current European IOD needs and capabilities in terms of technologies, carriers and launchers, as well as the potential of having a commercial IOD service.

DLR Space Administration is thinking of a renewal of its OOV Program to make possible OOV for researchers and companies. To know about the needs a survey is being performed.

The true intention of IOD/IOV is to provide frequent, predictable and affordable flight opportunities for innovative space technologies.