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COMMERCIAL SPACE SUITS FOR THE NEWSPACE AGE

Abstract

Now is the period that space access commercialization in LEO has been accelerating. It was a historical success for SpaceX Falcon 9 and Dragon to dock with the ISS for the first time in May 2012, followed by the ISS CRS-1 mission. Commercial companies have also been developing manned space vehicles with initial flights around 2016 or 2017. These orbital commercial human space vehicles will also target the public space tourism market. Suborbital space vehicle development is proceeding as well, and now commercial suborbital human space flight is expected to be realized this year or next year.

Space suits have been one of the key technologies for human space flight since the Yuri Gagarin era. NASA has been developing future space suits for the government human space mission programs and other space agencies also have next-generation spacesuit programs. According to the public release, Japan has started to develop space suits pilot type within a few years and will experiment with test articles on the board the ISS by 2020. Commercial space suits are being developed for commercial human spaceflight vehicles both for orbital and suborbital by several companies, and this new commercial orientation is attracting participation by non-space companies.

Space suits always require a very close interface with the vehicles. FAA is the competent authority for commercial space activities including safety issues for space suits, and has developed commercial space flight guidelines to direct training and vehicles familiarization under its safety first policy.

Generally speaking among the commercial space suits industry, space suits could be used as rental for suborbital and custom made for orbital commercial space flight. According to the space tourism wear market research, paying passengers would like to wear their favorite design and color. Because of these reason, it is also been considered to wear their own garments on technical commercial space suits. It is expected that there will be a larger demand for commercial space suits, so this presents new business tie-in opportunities. It is a challenging but attractive market development to use Japanese material technology in commercial spacesuits. This paper will describe current business collaborations, materials and technology research in Japan which has a potential support the next generation of space suits for utilization in commercial spaceflight, while also providing a novel means of enhanced radiation protection.