

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Commercial Human Spaceflight Programs (2)

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COMMERCIAL SPACEFLIGHT PREPARATION AND EXTRAVEHICULAR ACTIVITIES
TRAINING; THE NEXT GENERATION**Abstract**

Commercial orbital spaceflight vehicles are now a reality and are expected to carry passengers in the next year or two. SpaceX and Boeing should begin their commercial flight services to the ISS before or during 2020. Furthermore, companies such as Bigelow, Axiom and Orion Span aim to provide LEO destinations in the years ahead as ISS operations come to a close. The advent of these new vehicles and commercial space stations elicit a need for the development of dedicated commercial spaceflight training services to enable safe and productive spaceflight operations for commercial customers. This will include commercial extravehicular activity (EVA). Blue Abyss Ltd. is developing dedicated spaceflight training facilities and associated training curricula at several locations around the world including the US and UK. The Blue Abyss UK facility will include the largest pool in the world, larger than NASA's Neutral Buoyancy Laboratory in Houston. The pool will include a 50 meter deep shaft, and platforms at multiple depths for high pressure training, for technical diving and Remotely Operated Vehicle activity. A unique feature of the Blue Abyss neutral buoyancy training system will be the ability to combine Virtual Reality (VR) and Augmented Reality (AR) with neutral buoyancy EVA suit training for a totally immersive and realistic training experience. Full body suspension harnesses will also be utilized in conjunction with VR – AR to provide partial gravity simulation for lunar and Mars surface EVA training and suit testing. Amongst other services, Blue Abyss will offer a parabolic flight capability to provide weightless and partial gravity familiarization, orientation and training. These flights will be used to provide a realistic, bespoke training experience which can include pressure suit don – doffing and airlock ingress and egress during weightlessness and the likes of Moon and Mars gravities. Hypobaric chamber training will also be available for pressure suit safety and operations evaluation. Once the development of the initial facilities is underway, Blue Abyss plans to construct additional facilities in the Middle East and Asia in order to serve regional energy and space sector needs. This paper will outline the facilities, training curricula and future aspirations for the Blue Abyss commercial spaceflight EVA preparation services.