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## About The Protium Company

Elijah Shoemake, CCO – The Protium Company

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The Protium Company (Protium) began in 2015 in Pullman, WA as Protium Innovations LLC, a startup out of the Washington State University (WSU) Hydrogen Properties for Energy Research Lab. Our signature product is a liquid hydrogen tank optimized for aerospace, initially designed at WSU. In 2018, Protium was awarded an NSF SBIR Phase I award to further develop this technology using a service center at WSU. Our technology gained the attention of the US Army which has resulted in a total of \$4.5M in federal funding across two grants being awarded to WSU to further refine the technology. Protium has been subcontracted under both grants to provide prototype manufacturing and consulting services.

As a liquid hydrogen solutions provider, we invent and manufacture custom liquid hydrogen tanks to power clean, high-quality, and reliable electric power optimized for our customer's vehicles. Applying liquid hydrogen-electric propulsion to vehicles provides the reliability of an electric system with the flight endurance of traditionally fueled engines, all while reducing in-flight noise. By evolving the way in which we transport people and goods with hydrogen and electricity we save customers money, increase reliability, and enhance quality of life. The technology developed in this project utilizes additive manufacturing capabilities to extend the use of 3D printed polymer composites to cryogenic environments. Such cryogenic-rated 3D printed parts could have wide ranging impacts across cryogenic dependent technology areas from medical devices and spacecraft to drug and food processing.

In addition, Protium has been working with WSU to develop a transportable LH2 fueling station, enabling our customers to fuel their vehicles anywhere with access to power and water. The proposed fueling system will consume electricity and water to produce hydrogen via electrolysis and utilize a helium refrigerator to liquefy the hydrogen. The fueling system utilizes mostly commercial-off-the-shelf equipment and is containerized for ease of transport.

In addition to liquid hydrogen product development, increased organic demand for hydrogen expertise led Protium to launch a hydrogen consulting service in June 2019. Past consulting projects include working with a Public Utility District to provide connections, safety/compliance recommendations, and general hydrogen design knowledge for a grid-scale electrolyzer project as well as working with a research and development client to develop hydrogen safety documentation for a hydrogen liquefaction project. Protium is dedicated to a safety culture and is always striving to be at the forefront of understanding hydrogen safety. As such, Protium became an inaugural member of the Center for Hydrogen Safety in 2019.