**INSTITUTE FOR ADVANCED COMPOSITES MANUFACTURING INNOVATION**

**News Release**

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IACMI – The Composites Institute Announces Collaborative Project to Innovate Smart Composite Pressure Vessels in Manufacturing

**Knoxville, Tenn., July 26, 2018 –** The Institute for Advanced Composites Manufacturing Innovation (IACMI), a 160+ member consortium committed to increasing domestic production capacity and manufacturing jobs across the U.S., announces a project to develop Smart Composite Pressure Vessels (SCPV) with integrated health monitoring. The project is led by Steelhead Composites, LLC, with the project team including Teijin Carbon, Oak Ridge National Laboratory (ORNL), and the University of Tennessee, Knoxville (UT).

The goal of this technical collaboration is to develop structurally predictable, low-cost smart composite pressure vessels (SCPVs) without compromising safety by employing integrated, reliable health-monitoring. The project leverages smart fiber optic sensor technology, integrated and developed at the University of Tennessee, Knoxville by Professor Dayakar Penumadu to optimize carbon fiber translation and to then integrate this technology, enabling on-demand feedback on fatigue related performance. Steelhead Composites will utilize ORNL’s composite processing experience to optimize monitoring procedures in the vessel assembly. This validated technology can then be used to lower the cost of adopting composite pressure vessels in fuel cell cars and other applications in transportation markets.

Throughout this project, the integrated system will allow for continuous monitoring of the vessel’s health, maintain an ongoing record of cycle life characteristics, and provide immediate feedback on the vessel’s structure in response to any unplanned damage caused by either low or high energy impact. “Currently, CPV safety is measured with aerospace functions as the baseline application. The continuous and predictable health-monitoring that will be developed through this project seeks to enhance operational safety and reduce the cost of these vessels in the automotive sector.” said Dr. Kaushik Mallick, Director of Engineering at Steelhead Composites, LLC.

The ultimate goal of this project is to allow for higher confidence in the safety design factor of the vessels, thereby reducing the cost associated with these critical pressure-bearing composite structures. “Thorough validation of application-specific safety standards is necessary for broad adoption of CPVs in transportation markets,” said John A. Hopkins, CEO of the Composites Institute. “The IACMI members who are partners in this project have the experience and technical research capabilities to make help drive this adoption,” detailed Hopkins.

The method developed by this process will open new opportunities for the integration of structural health-monitoring systems into the carbon fiber compressed gas composites industry. Project outcomes can enable private industry to innovate the manufacturing process through effectively testing the materials and processes utilized in the development of composite pressure vessels in higher volume applications.
The Steelhead-led project is supported in part through IACMI state partners including the Colorado Office of Economic Development and International Trade (COEDIT) and Tennessee Department of Economic and Community Development. These state partners catalyze innovation by supporting IACMI and its members.

*Photo caption: 7.5 Litre Capacity Composite Overwrapped Pressure Vessel with Teijin Carbon Fiber.*

**About IACMI-The Composites Institute:** The Institute for Advanced Composites Manufacturing Innovation (IACMI), managed by the Collaborative Composite Solutions Corporation (CCS), is a partnership of industry, universities, national laboratories, and federal, state and local governments working together to benefit the nation’s energy and economic security by sharing existing resources and co-investing to accelerate innovative research and development in the advanced composites field. CCS is a not-for-profit organization established by The University of Tennessee Research Foundation. The national Manufacturing USA institute is supported by a $70 million commitment from the U.S. Department of Energy’s Advanced Manufacturing Office, and over $180 million committed from IACMI’s partners. Find out more at IACMI.org.

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