

TRANSITIONS

PROPEL SPOTLIGHT



Propel's Smart Integrated Shirt Receives IFF Innovation Award

By JENNIFER REISCH

The Industrial Fabrics Foundation (IFF) Innovation Award encourages companies around the globe to “weave tomorrow’s ideas into the fabrics of today.” First place for the 2020 Innovation Award went to Pawtucket, R.I.-based Propel LLC for the project “Propel LLC Smart Integrated Shirt.”

Propel’s U.S. Navy SBIR-funded smart shirt includes three patent pending innovations to monitor the physiology of the wearer in a garment that looks and feels no different than any other first layer compression garment. It is important that a smart garment not be noticed by the wearer so that the data is not impacted by the change in awareness. This shirt is made with Propel’s proprietary electrically enabled yarn that behaves like a traditional yarn but has the conductive elements needed for transmitting data and power.

The shirt has soft and flexible solder-free textile connectors designed for wearer comfort and user-transparency. All components within the shirt are U.S. sourced. The technology allows continuous real-time monitoring of the operator’s physiological status to measure and predict physical and cognitive performance. Electrically enabled textiles permit reduced



Courtesy of Propel LLC

Propel LLC Smart Integrated Shirt

size and weight requirements for data and power networks and reduce the load the Sailor must carry. The Navy has plans to test Propel’s smart shirts at Naval Air Warfare Center Aircraft Division at Pax River, but that testing is on hold due to COVID-19.

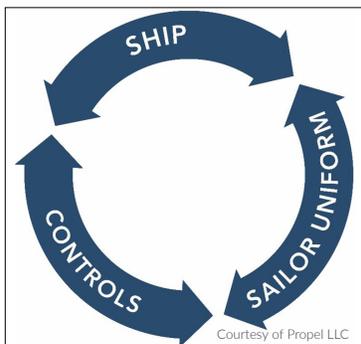
The smart shirt project started when the U.S. Navy identified a need to develop an ensemble to advance human functionality, optimize personnel performance to account for reduced manning and to enhance the

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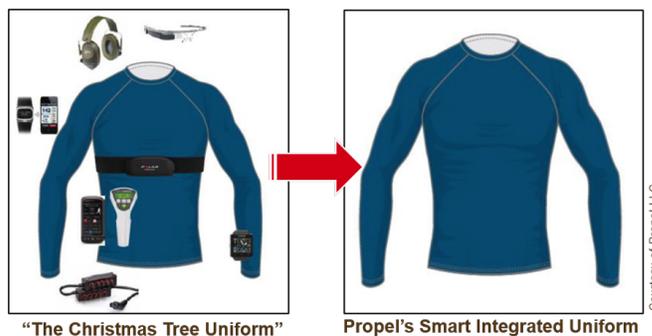
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survivability of future warships by embedding technologies into Sailors' uniforms to create a robust human-to-ship command and control interface. Naval uniforms must keep pace with evolving multi-functional human-system interface technologies envisioned by the Navy for future ship command, control and operation; wearable technologies capable of seamlessly integrating with evolving ship systems are needed.

Propel identified the technology gaps that needed to be addressed in order to advance the Navy's vision of technologies that wirelessly sense, process and receive or transmit information between the ship platform and the Sailor. Propel's e-textile innovations and smart shirt will permit monitoring and relaying of the human state of health important for situations such as damage control events. Propel's innovations are enabling technologies that are expected to be the building blocks to design and build advanced systems permitting future integration of the Sailor into the Navy's system of systems, enhancing the availability of mission-critical information for both the Sailor and the command.



Propel's objective is to connect with Navy and other DoD programs for whom the developed e-textile technologies will be a game changer. These include opportunities for use in other demanding operational environments, such as when wearing the Joint Service Lightweight



Integrated Suit Technology (JSLIST) for chemical and biological agent protection, as well as Explosive Ordnance Disposal (EOD) suits for bomb disposal. There are many other applications that would be enhanced by replacing traditional circuits with textile-based data and power circuits, such as e-textile cables and e-textile enabled composite structures. At the invitation of the Navy SBIR Office, Propel presented the technology at the January 2020 Consumer Electronics Show in Las Vegas, and that opportunity—together with the IFF Innovation Award—resulted in new opportunities for government and commercial applications of Propel's e-textile innovations.

To learn more about Propel's winning technology, watch the video from the IFF: <https://youtu.be/6cDgNOT3C9Y>

The IFF is a non-profit dedicated to education and research in specialty fabrics. IFF partners with the Industrial Fabrics Association International (IFAI) to support growth and innovation. IFAI is a member-owned, member-driven trade association representing the global industrial fabrics industry.

To learn more about Propel LLC, visit the company website at <https://propel-llc.com/>.

