

EVOLVING THREAD: RNLI KIT INNOVATION

When the Royal National Lifeboat Institution (RNLI) was formed 200 years ago, Personal Protection Equipment (PPE) consisted of a cork life jacket and woollen jumpers.

Since then, PPE has gradually evolved, incorporating improved levels of protection, such as jackets that help keep the crew warm and afloat in the water. However, the last 20 years have seen significant innovations, transforming the safety of crews operating at sea and on rivers.

CHALLENGING DESIGN

One of the main challenges in redesigning the RNLI kit is balancing durability with comfort. Crew members need kits that can withstand cold water, wind, and rough conditions while still allowing them to perform tasks such as operating boats and rescuing people from the water or confined spaces. Ensuring that suits are not too tight, and allowing for layering while maintaining mobility is crucial. Common points of failure, such as zips and latex seals, also need regular improvement to ensure longevity. Kits must adhere to strict safety regulations, such as SOLAS standards, without compromising wearability.

Long-time Gravesend RNLI crew member Tim Wyatt sat with early-career outdoor clothing designer Matt Davies to discuss RNLI kit design, safety, and overcoming challenges.

TIM WYATT

Tim Wyatt has been a volunteer crew member at the Gravesend RNLI station for 18 years. His day job is in research and development for BT Openreach, specialising in fibre optics.

Although Tim's professional role doesn't directly overlap with his RNLI duties, his keen interest in materials and clothing has made him 'something of a clothing geek' within the station. His technical knowledge, particularly about fabrics and their performance in extreme conditions, has proved valuable in discussions about developing life-saving equipment.

MATT DAVIES

Matt Davies specialises in sportswear design, with a background in creating outdoor and performance gear for activities such as rock climbing and watersports. His expertise in specialist clothing construction has been

informed by decades of fabric innovation, and working at companies like Vollebak, which works with fabric from textile mills like Pertex, Mectex and Schoeller. Matt's practical experience in outdoor sports ensures that the equipment he helps conceive is fit for purpose in demanding environments.

EVOLVING EXPECTATIONS

Crew expectations, alongside regulations, increasingly inform how RNLI PPE develops. New technologies in fabric and design are playing a growing role. "Thermal efficiency is one of the major improvements," Matt emphasises. Tim adds, 'Crew members are now equipped with dry suits, base layers, and PPE designed to withstand extreme weather and temperature fluctuations, from cold water to high winds.'

Matt explains, "Materials like Dyneema, used in ropes and sails, become stronger in colder temperatures, making them ideal for harsh environments." Tim picks up on this, "Crew members might be woken from a warm bed and find themselves in freezing conditions within minutes. The need for gear that can quickly adapt is vital."

INNOVATION

Advances in fabric technology are also driving innovation in other areas. The development of reflective materials that enhance visibility at night, combined with infrared sensors to locate individuals, represents significant progress. Matt notes, "Such materials and innovations are often developed through collaborations with the military, where research into rugged, durable equipment is ongoing."

Tim describes modern life jackets: 'They have integrated buoyancy features that automatically keep the wearer afloat, even without activating the gas canister that inflates the jacket. The kit also includes distress flares, location beacons, and helmets with built-in lights and visors to improve safety in all conditions.'

FUTURE DEVELOPMENTS

'The future will likely see kit becoming more efficient at regulating body temperature while maintaining durability in extreme conditions,' Tim summarises. 'Warmer temperatures due to climate change could lead to more unpredictable storms, while cold snaps increase the risk of hypothermia for crew and those they rescue. RNLI kit must therefore adapt to a broader range of conditions.'

Matt adds, "Innovations in material science are likely to lead to more affordable and accessible high-performance gear. Robots and AI will play a role in the design and testing phases, allowing for more precise, data-driven improvements. AI may also identify material weaknesses and suggest solutions that reduce human error in the design of life-saving equipment. Additionally, the military and stringent PPE and sports regulations will drive the innovations in textiles and clothing construction."

WHAT'S NEXT?

In the past 20 years, wetsuits, dry suits, and other safety gear have become more flexible and comfortable. This trend is expected to continue. Attention to detail and strict procurement processes are part of what makes the RNLI one of the most expensive charities to operate. Ensuring all PPE meets high safety and durability standards keeps the organisation balancing cost with the

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— Tim Wyatt, Volunteer Crew Member, Gravesend RNLI

need for the best equipment available. Matt predicts, "Machinery and algorithms will help manufacturers design, weave and knit more specific configurations for certain environmental conditions, like having increased thermal conductivity in colder climates, which will benefit people doing roles, like in Tim's case." Tim concludes. 'This is only likely to improve with time.' ■

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Cork Lifejacket, 1854



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RNLI AND GRAVESEND STATION

The RNLI is a charity dedicated to saving lives at sea, offering services including lifeguards and inland waterway support. Gravesend station is one of four RNLI stations on the River Thames, ensuring vital maritime and waterway safety given the heavy river traffic.

Following the Marchioness disaster in 1989, which claimed 51 lives, the RNLI established three full-time Thames stations to improve response times. Due to its strategic location, Gravesend became one of the full-time stations as it allows for swift rescues at speeds of up to 40 knots (45 mph).

Around 50 crew members, a mix of volunteers and full-time staff, operate from Gravesend covering the Thames from Woolwich to Canvey Island.