

WORKWEAR

Power dressing

The personal protective clothing and equipment worn by upstream oil and gas employees – whether working in the cold North Sea or fracking in the heat of a Texan summer – continues to become more technologically sophisticated, writes Nic Newman.

Before the US introduced the Occupational Safety and Health Administration (OSHA) in 2010, it was quite common to see oil rig workers on the other side of the Atlantic kitted out in a scruffy oil-stained t-shirt, jeans and boots without any protection against fires or falling tools. OSHA required all technicians and service industry employees working in the vicinity of a rig to wear flame-resistant clothing, steel-toe boots, hard hats, a personal gas monitor and safety glasses. Today, the apparel of workers will relate not only to their particular activity but also the workplace environment. Fitting-out employees with the correct protective equipment to safeguard them from danger and the elements is now regarded as a worthwhile cost, since it is also good for staff morale.

According to Frost & Sullivan, the protective workwear market has grown substantially with the huge expansion in the US shale oil and gas industry and is set to grow from \$1.5bn in 2011 to \$2.3bn by 2017. Tim Anson, European Business Manager for the US-made Cordura brand, observes: 'Globally, the workwear market is growing by about 10–11%/y.' Whether this rate of growth will continue is questionable, however, given deep cuts in headcount in North America's shale oil industry and global capital spending cuts of \$220bn in response to low oil prices.

Driving the trends

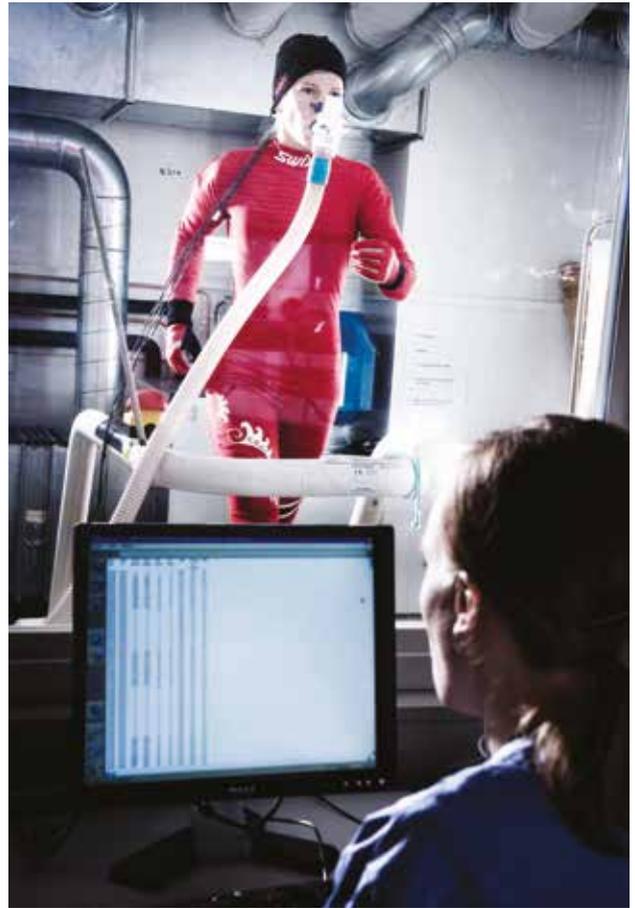
The growth of the oil and gas industry worldwide and the unexpected shale energy revolution in North America inaugurated a major hiring drive by oil and field service companies.

The newly recruited workers, especially to unconventional oil working, demanded greater levels of comfort, durability and style whilst simultaneously meeting the highest standards in safety and protection. 'Such drivers are helping to drive innovation,' says Mark Saner, Workrite Uniform Technical Manager.

At the same time, new standards have been agreed by OSHA, the UK Health and Safety Executive (HSE) and the Canadian Association of Petroleum Producers (CAPP), as well as the International Organisation for Standardisation (ISO), the world's largest developer of voluntary international standards. Standardisation of clothing and equipment, for what is essentially a global industry, is not only good for manufacturers, but also for the oil company's procurement professionals, since a global or regional accepted standard helps selection and adherence to health and safety regulations.

The introduction of lighter multi-functional fabrics sits alongside a trend towards smart workwear and clothing specially adapted to specific work activities and conditions. In general, as Saner suggests: 'Oil and gas drilling workers are looking for lighter-weight, more comfortable flame-resistant garments that also look great and meet the industry standards.'

In West Texas's Eagle Ford, Barnett and Haynesville shale plays, or in Nigeria, Angola and Mozambique, where summer temperatures can reach 100°F-plus, the major fear is the ever present danger of flash fires and heat stress. Such conditions require lighter-weight flame-retardant clothing. Manufacturers are rising



to the challenge – Carhartt has just launched a new line of products it calls FR Force, which includes 100%-cotton knit t-shirts that are not only lightweight but also meet the US National Fire Protection Association 2112 flame retardant standard.

There is also a trend towards developing multi-functional fabrics featuring durability and resistance to abrasions, tears and scuffs. For this, rather than pure cotton, a fabric containing antistatic fibres to prevent static building up and sparking a fire, plus 10% nylon for durability, is the fabric of choice. Norway's Wenaas and the Cordura clothing brand ranges embody flame-retardancy, antistatic properties, high-visibility and chemical resistance. So the procurement officer for a major rig owner, such as Transocean, can now choose from a range of highly functional clothing, which is anti-stat protected, inherently flame-retardant and high-visibility, as well as being able to act as a barrier to chemical spills – in other words, a fabric that meets all the European and US health and safety standards for such clothing.

However, high-tech performance isn't enough for some. Europe's oil and gas workers

Testing at the SINTEF Work Physiology Laboratory of the ColdWear range, developed for ultra-cold oil fields such as Alaska, the North Sea and Siberia

Source: SINTEF/Thor Nielsen

are being offered 'image wear', heavily marketed designer-branded clothing such as Helly Hansen and Dickies, especially designed for oil and gas workers. This trend has also moved across the Atlantic. 'We are now seeing the US catch up with Europe in adopting image wear in the workwear market,' explains Anson.

Designers of oil industry workwear in the west work to the regulations and standards governing the composition, method of manufacture and safety requirements of the day. As Saner explains: 'Manufacturers are tasked with developing products that not only meet or exceed the requirements of industry regulations, but also do so in a way that doesn't sacrifice usability, comfort, cost or practicality.' Despite tougher regulations, it remains the case that clothing worn by a fire accident victim can increase the severity of a burn. 'I know of numerous incidents with severe burn injuries and resultant fatalities in which we later determined, if the workers had worn no clothing [at all], their injuries would have been less severe, and there would not have been any fatalities,' says Peter Clark Of Apparel Solutions International.

The future of PPE

Smart clothing, known as ColdWear, developed by Norwegian research organisation SINTEF, is a pioneering development for ultra-cold oil fields such as in Alaska, the North Sea and Siberia. It is a fabric range combined with sensors designed to monitor a worker's temperature, humidity and perspiration as well as their exact location and direction of travel. Sensors also measure external temperatures and humidity. Such detailed real-time information on workers' body condition allow supervisors to not only monitor health but also influence decisions on when to stop work for the day. And in spite of its technological wizardry, the fabric can also be laundered.

According to leading research institutes, wearable technologies will become the next megatrend. Oil giant BP has already distributed more than 24,500 Fitbit fitness trackers to its North American workforce, including those working on oil refineries and oil rigs, as part of a programme to cut its staff insurance costs. As Chris Brauer, Director of Innovation at Goldsmiths, University of London, explains: 'Underwriters are more trusting of these devices than the self-reporting of employees.'

More technologically sophisticated are the recently introduced 'smart glasses' which improve communications between control staff and on-site workers. These can provide on-site staff with key information as and when they need it, in the form of data, schematics, maps, guidelines or instructions. Even more remarkable, smart glasses facilitate advanced, immersive and remote collaboration, including virtual over-the-shoulder coaching, thereby boosting on-the-job training. In practice, a worker with smart glasses can have ready access to interactive equipment manuals while repairing an oil rig or bridge cable, or receive specific directives such as emergency procedures – and all of this hands free. The arrival of new commercially available apparel designed for the consumer market such as smart watches is also likely to spark a further round of innovative products which will be adopted wholesale or tailored for PPE users.

Evidently, 'smart' dress is the style of the future for E&P operations. ●

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