



## New Arc Rated Foul Weather Protection

How Scottish and Southern Electricity Network  
Engineers Benefit From GORE-TEX® PYRAD® Technology



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## **Lighter and more flexible than ever – Scottish and Southern Electricity Networks engineers benefit from new GORE-TEX® product protection**

W. L. Gore & Associates Inc. has long been at the cutting edge of technological developments in protective outerwear. Leading companies increasingly recognise the benefits in providing the very best in PPE for their employees, particularly those working in tough outdoor conditions. Scottish and Southern Electricity Networks (SSEN) has recently witnessed positive results when their engineers tested new lightweight waterproof jackets and salopettes featuring GORE-TEX® Fabrics.

Scottish and Southern Electricity Networks is the company that keeps the power on for over 3.5 million homes and businesses across central southern England and northern Scotland, including some of the most remote areas in the UK such as Shetland, Orkney and the Western Isles. Their engineers work outside in some of the harshest weather conditions within the U.K. to install, maintain and also repair electrical transmission and energy distribution equipment. On the rare occasions there is a fault or power cut, SSEN must ensure that things are back up and running again as safely and as quickly as possible. To be able to do this, SSEN has engineers on hand to respond to any emergency or power cut situations 24/7, 365 days of the year.

### **Background**

During the initial meeting in November 2015 between SSEN's senior training staff and engineers and Associates from Gore & Associates (UK) Limited, the crucial importance of fit for purpose PPE garments was emphasised.

The winters in the United Kingdom can bring with them very extreme weather, including heavy rain, snow, gale force winds and storm conditions. This means that engineers are sometimes required to work consecutively for several days to restore the power if the weather has damaged parts of the network. This means that it is vital that they have PPE that can dry out quickly and be ready to wear for their next shift.

On top of this, when working with electrical systems there is always a remote risk of a person being exposed to an incident involving a high temperature arc flash. Such incidents are extremely rare but nevertheless, companies choose to protect their engineers by procuring protective workwear with arc retardant properties.

Existing PPE used widely in this sector satisfactorily meets health and safety requirements but was reported by some end users as heavy to wear once wet, with a long drying out time. While working up a pole, engineers also need their garments to be flexible - stiff sleeves are a nuisance when dexterity is required. For this job, the correct balance of protection and ergonomics is essential for SSEN's engineers.

Due to the nature of the job, engineers often face a difficult journey to reach the workplace. The journey may involve a hike across fields, over stiles and fences so the clothing therefore also need to be robust enough to protect the workers from more general hazards such as ticks, thorns, flies, damp, manure, and midges.

The solution was to find a garment that would be tough enough for working conditions and that would be waterproof, windproof, flexible and light as well.

Working closely with its brand partner Bell Apparel, a new garment offering was developed utilising GORE-TEX® PYRAD® Technology. These garments are up to 45% lighter than many other models available in the market. The new garments are arc rated, durable and highly breathable, as well as being available in high visibility yellow as well as orange. They were tested for waterproofing in Gore's Rain Tower with excellent results, after which field tests were carried out by issuing the garments to a number of SSEN engineers. Their feedback was immensely helpful in gaining a good understanding of the experience of end users.

### **Field Testing**

To test the Arc rated GORE-TEX® PYRAD® garments, a number of jackets were given to the engineers who do some of the most challenging jobs within SSEN. Garments were issued in February 2016, with follow-up feedback sessions from the test team in March and August 2016. During the process the design of the garment was modified based on feedback from the wearers, with replacement garments being assessed by some wearers for final style suitability assessment.

### **Weekly Assessment Questionnaire Results**

From February through to July 2016 the SSEN test team completed feedback forms on a weekly basis. These forms reviewed: the varying weather conditions in which workers were operating, the comfort, flexibility and wearing weight of the jacket, assessed the drying properties of the jackets and asked for any additional comments the test team felt relevant to the trial.

The team reported back that in any given week they carried out their duties in light to heavy rain, variable wind conditions and in all cases the outside temperature ranged from moderate through to cold.

- All testers reported that they wore the jacket as part of a three-layer system; base layer, mid-layer and outer jacket.
- Duties conducted included: pole erecting, cable laying, overhead line work, cable jointing and line patrolling.
- All feedback noted that the garment was either pleasantly cool or sufficiently warm depending on the climate and task in hand: none stated that the jacket was too hot whilst at work.
- Asked to comment on how ergonomic they found the jacket, ¼ of responses stated very soft and very flexible, ¾ stated soft and flexible.
- Additional comments to open ended questions about how the test jacket compared to their current jacket whilst wearing a harness included: 'it was very comfortable and easy to move in', 'stayed light in the rain', 'very light'.

- Drying time feedback ranged from 50% explaining the garment was dry within a few hours, 25% stating it was dry by the next day (dried well overnight) and 25% commenting the jacket was dry by the next use.

### **Feedback From End Users**

In August 2016, further and fuller feedback was obtained from engineers working for SSEN in the remotest parts of Scotland.

Linesman Angus Campbell described how much lighter his new GORE-TEX® PYRAD® Jacket felt: “This summer I’ve been climbing a great deal - it’s flexible when working on top of the pole. You can move freely, giving less strain on my shoulders and no issue to reach and stretch for up to 2 hours whilst on a pole. I’ve even worn it when it’s not chucking it down as it’s breathable and so I’ve used it as a windcheater. A few chaps on my team have actually tried to steal the test jacket!” He added “Sometimes I’ve forgotten to bring the jacket in with me at the end of my shift and it has still dried out overnight in the back of my unheated van.”

Brian Anderson, a linesman in Shetland noted: “The material is good, breathable and doesn’t make you sweat. The new garment has excellent stretch and freedom of movement.”

Brian also talked about the problem of ‘wet neck’, saying that this is something workers in the past have had to tolerate, adding that the design of the collar and hood on the test jacket stops wet neck from happening.

Craig Mckillop, cable jointer and linesman in Oban described the worst possible weather conditions - rain, hail, snow and wind and reported the new jacket feels “about 50% lighter than most other jackets he has tried, especially in the rain”. He said ‘It’s very comfortable, water runs off it, I can wear it for a long period of time. I’d recommend the new jacket to my work colleagues. It seems that it would be tough and good enough to last for the job. I feel perfectly confident facing the winter work ahead with this new jacket.”

### **In Conclusion**

Peter Booth and Willie Kirk are Overhead Lines Trainers, based in SSEN’s Perth Training Centre, with more than 30 years’ experience in the industry. On a typical training day 90% of the training takes place outside unless the weather makes it unsafe to do so.

Willie said that “Consistency of our PPE is always needed regardless of the differences in weather conditions in the south of the country and up in Scotland. South-ern based workers are often called up to northern Scotland when we need more man power and we can also be required to travel south if they need extra support there too.

Both Peter and Willie tested the new jackets and trousers. Peter said: “The test jacket dries really well and usually within 1.5 hours.”

Ian Crawley, Operational Safety Manager at SSEN comments: “We are responsible for the distribution and transmission of electricity across northern Scotland and central Southern

England, with our teams sometimes working in very remote and very challenging conditions. Our engineers deserve nothing less than the best, and it is vital that our PPE is safe, comfortable and able to withstand a wide range of weather conditions. This new range of PPE for our engineers allows them to operate safely within challenging environments and focus on the job at hand, helping us to continue to provide our customers with the best service possible.”

All end user reports have been very positive with the vast majority reporting the garment is light and comfortable and offers equal if not better protection than existing options.

SSEN engineers need a good balance of protection and ergonomics from their work-wear and PPE. These new Gore-Tex Pyrad garments provide this improved balance and ultimately could help SSEN deliver safe outcomes for their customers and their workforce.

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