Cross-arms speed up connection of electricity supplies

Manchester University

A revolutionary device developed by engineers at The University of Manchester and EPL Composite Solutions Ltd. could dramatically increase the capacity of the UK's electricity network, enabling rapid increases in renewable generation and lower bills for consumers.

Insulated Cross-arms, manufactured and sold by University of Manchester spin-out company Arago Technology Ltd., have been installed on pylons in some of the most stark and remote areas of the UK to test their resistance to extreme weather and are also being tested for an eventual use with 400,000 volt systems at a coastal site in Scotland.

Tests have also been carried out at the University's High Voltage Laboratory which has subjected them to lightning strikes of more than 1.4 million volts.

Modelling shows that in some cases the new Cross-arms are capable of increasing the power carrying capability of a pylon by up to 2.5 times.

Installing the insulated Cross-arms would aid the UK meet the growing demand for electricity and help in the connection of 'green' forms of electricity generation.

The dramatic increase in capacity of the electricity system that would result from the installation of the cross-arms could reduce the need to build more pylons and could reduce household bills.

Without them, utility companies would be faced with the expensive and laborious task of applying to build more pylons. Receiving planning permission alone can take many years with no guarantee of success.

Resistance to plans to build more overhead lines and the cost of undergrounding have greatly increased demand on utility companies with further demand expected if the UK's householders move from gas to electricity for domestic heating and if electric vehicles gain in popularity. The insulated Cross-arms enable increased electricity supply using the same pylons or the use of smaller pylons when building a new electricity line.

Arago Technology is now planning to install 12 Cross-arms with energy companies Scottish Hydro Electric Transmission (SHETL) and National Grid (NG) with a view to further roll-out.

Professor Simon Rowland, from the University's School of Electrical and Electronic Engineering, said: "It's great to see research being translated into solutions for

society. If the insulated Cross-arms can help to connect renewable energy sources with lower cost and less visual impact, everybody will benefit”

Arago’s Commercial Manager Dr Frank Allison added: “The installation of the insulated Cross-arms in a number of locations is a landmark event for Arago and its partners and vindicates the hours of hard work and dedication by all members of the team.

“Since energisation equivalent to a 400,000 volt system, early results are very positive suggesting the insulating Cross-arms are performing as expected, although more tests are needed.”

The Cross-arm won the Power & Energy Award at the IET Innovation awards ceremony at the end of last year.

To date the project has been funded by SHETL, NG and The University of Manchester Intellectual Property (UMIP) Premier Fund, managed by MTI Ventures.

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