Novel technologies to repower extra-high voltage electricity lines unveiled in Budapest

Budapest, 6 April 2018 – Yesterday major players in the electricity sector unveiled pioneering technologies to repower and improve the design, operation and maintenance of existing high voltage power lines. The breakthroughs were presented at an international workshop in Budapest, organised by Hungarian Transmission System Operator (TSO) MAVIR and the Budapest University of Technology and Economics (BME), in cooperation with German TSO 50Hertz.

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This work was developed in the context of the Demonstration No4 of BEST PATHS, the largest FP7 research project ever financed by the European Commission in the energy sector. Experts from the following companies took part in these research initiatives: 50Hertz (Germany), BAM (Germany), BME VIKING (Hungary) EFLA (Norway), ELIA (Belgium), i^2G on behalf of STRI (Sweden), MAVIR (Hungary), Red Electrica de España (Spain), Relogable (Spain), Statnett (Norway).

Matthias Müller-Mienack, Head of Research and Studies at GridLab in Germany and Chairman of BEST PATHS' Demo 4 said "Between the 1960's and the 90's, building new high voltage overhead lines was common practice. But today citizens are more vocal against the construction of new power lines. And what's more, even maintenance measures have to be planned years in advance because of the higher loading of the network, which makes it more difficult now to operate the network without critical lines for long periods.

Our research stems from this need to improve and repower existing power lines, to overcome the current lack of long-lasting experience with new conductor technologies among European Transmission System Operators. Our results are going to affect the lives of millions of energy consumers in Europe, because the

improved management of electricity lines will ensure the correct supply of electricity, decrease the risk of blackouts, reduce the visual impact of towers and enable the integration of more renewables.”

Best Path’s Demo 4 is developing and testing the following innovations:

Novel insulated cross-arms. Experts tested and installed a novel insulated cross-arms technology for a new overhead line at ELIA (Belgium). Insulated cross arms can be used to raise the voltage level of existing or new overhead lines. This way they increase the power transferred and potentially defer the need to construct new power lines. For the first time, experts also developed new trustworthy testing methodologies to verify the electrical performance of insulated cross-arms, as no standards are available yet.
High Temperature Low Sag conductors. Experts developed new mechanical and electrical long-term tests for High Temperature Low Sag (HTLS) conductors to obtain reliable data on their ageing mechanism, reliability, and their mechanical and electrical performance. The applied testing scheme allowed for the first time a direct and comprehensive comparison of different HTLS wire types.
New composite tower. Experts are designing and engineering a new composite tower for 420 kV level that is significantly lighter and has less visual impact compared to a steel lattice tower. The low weight results in a tower that is easier to transport as the number of helicopter lifts were reduced by at least 50%. In addition, it is more efficient to assemble due to larger parts and fewer joints.
Dynamic Line Rating. Experts developed a prototype sensor for Dynamic Line Rating, based on low cost sensors, that allows the transmission lines to operate with current technologies at higher capacity in real-time.
Innovative live-line working. Experts established new methods and technologies to improve live-line working, including a prototype conductor car, a novel insulated mounting chair as well as the technology of robotic installation of aircraft warning markers. These technologies help to increase the network availability.

As a special highlight of the workshop in Budapest, participants visited the high-voltage testing laboratory of BME, where MAVIR and BME held a live presentation of a damper exchange and an insulator replacement under voltage while applying the developed live-line working technologies.

Read more: http://www.bestpaths-project.eu/en/news/novel-technologies-to-repower-extra-high-voltage-electricity-lines-unveiled-in-budapest

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