

## High safety, low maintenance, extreme weather proof aerial cable system

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### ABSTRACT

Today, we are completely dependent on access to electrical power. Power outages can quickly imply severe consequences and expense for entire communities.

In 2012, outage costs were estimated at nearly 1 billion SEK (100 million Euros) in Sweden alone.

A system has been developed in response to demands by utility companies for extreme weather resistance without power interruption. The unique design can handle e.g. ice loads, storms and snow-laden trees. The self-supporting conductors take up the bulk of the tensile stress. The forces of a falling tree are transferred through the cable sheath and insulation to the supporting conductor, without damaging the cable. This reduces down-time for repair in comparison with other systems – resulting in fewer repair call-outs and smooth maintenance.



Fig.1. Heavy snow-covered branches on live cables

### KEYWORDS

AXCES™; AXCES-O; Medium voltage cable; Duct; Aerial cable; Three-core cable, Fully insulated medium voltage aerial cable, Fully insulated high voltage aerial cable

### 1. THE AERIAL CABLE CONCEPT

The robust construction of the fully insulated cable system offers several significant savings due to greater freedom and flexibility of line routing. There is no risk of power outages caused by falling trees or a bird-induced short circuit on bare lines. Risks of direct lightning strikes are also greatly reduced compared with bare lines, since the fully insulated cable does not attract lightning strikes, and indirect strikes cause no damage to cables. Lightning problems at OHL/underground cable transitions are also reduced.

Other benefits of the fully insulated cable system are the rarity of power cuts caused by broken line wires, and of environmental hazards such as sand, salt and conducting dust causing fires. Conventional bare line systems are prone to short circuits due to clashing conductors, whereas the fully insulated system comprises one fully

insulated cable, and therefore completely eliminates this problem. Tests on installations on the Shetland Islands and in Norway have proven that galloping and vibration are no problem.

As a result of the above, fewer repair call-outs are required for the fully insulated cable system, and the number of difficult repair and line-clearing jobs is reduced. Emergency call-outs are not needed.

If required by the terrain, the cable also works well as an underwater cable due to its high tensile strength and density in water.



Fig.2. Cable coming up from the ground and continuing as aerial cable

AXCES™-cables are used here as the only ones proven to handle extreme weather conditions. Continuous development has resulted in an even better internal force transfer system, eliminating the problem of an upper size limit for conductors.



Fig.3. Fallen tree over an AXCES™ cable