

BGI Solutions develops successful incident management system for the 50Hertz Transmission GmbH

Problem statement

50 Hertz is the frequency of the electricity network and the basis for a steady power supply in Germany. One of the core functions of the network operator 50Hertz Transmission GmbH is to keep this supply frequency permanently stable.

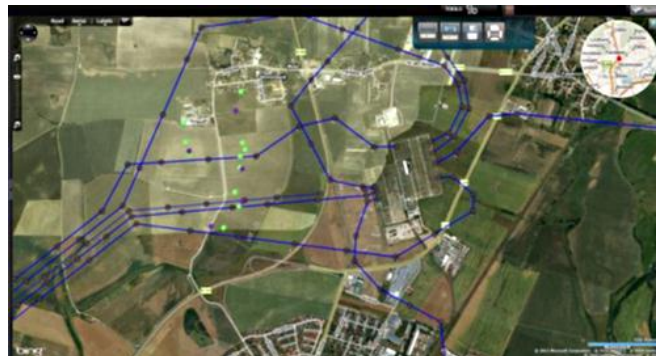


To ensure that this is the case, it is essential to react as quickly as possible to weather-related incidents in the power supply, such as lightning strikes, or to take action in respect of the weather forecast. Besides the “What”, especially the “Where” of an incident is of great importance. The employees of the Transmission Control Center of 50Hertz have to analyze and evaluate the incoming data 24 hours a day, in which the information comes from several different sources and the evaluation is carried out in several different systems.

To begin with, BGI Solutions’ task was to implement an incident management system for the occurrence of lightning strikes, which then serves as a basis for a management system for further weather-related incidents.

Solution

Firstly, the entire power grid of 50 Hertz was accurately reproduced on Bing Maps and provided with relevant information, including all power line sections, electricity poles, wind turbines and transformer substations. Now this map serves as a basis for the application of the *Transmission GridMapper*, which is based on the award-winning geographical reporting tool *ThematicMapper* from BGI Solutions.



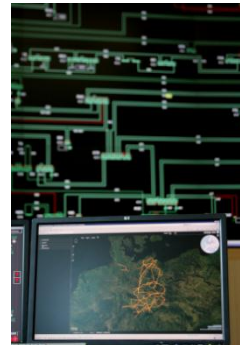
Display of the power network (blue lines) including electricity poles (purple dots) and power line sections with lightning strikes (green dots) in the *Transmission GridMapper*.

Additionally a lightning database was integrated into the application, which reports the incoming real-time information of lightning strikes. The system processes this data and displays it graphically. Besides the possibility of a precise location tracking of a current lightning strike and the respective power line section, an incident tracking module was developed, which enables to display and animate the time flow of the lightning strike in a

“movie mode”. This way, predictions of the course of the storm front can be made and lightning strikes can be analyzed.

Added value

Through the visualization of the incident on the map together with the accurate allocation of the power line section the employees in the Transmission Control Center can instantly decide what there is to do and take appropriate actions according to the geographical conditions. Therefore, more reliable decisions can be made and the time to react can be significantly shortened. Moreover the incidents that already occurred can be better assigned and visualized so that a secure evaluation can be made.



System

Using the Silverlight technology, the designed RIA (Rich Internet Application) *Transmission GridMaps* is based on conventional 3-Layer architecture and was connected to the existing database management system Oracle 10gi (with spatial options) from 50Hertz. The integrated lightning database from 50Hertz, which is fed with real-time data, provides the up-to-date lightning information in form of a GeorSS feed.

Transmission GridMaps is a browser application and can be flexibly adapted to any workplace.

“We as BGI are very pleased that with the GridMaps-Solution we were able to contribute to an electricity transmission without disturbances through Europe and to effectively support the alternative energy sources.” Axel Borchert, CEO of BGI Solutions.

Future prospects

It is easy to embed further layers to the *BGI Transmission GridMapper* such as weather conditions like rain, wind velocity and wind direction as well as temperature and global radiation. This way, forecasts and warnings through weather-related incidents can be improved and clearly displayed, processed and analyzed with only one tool.

Additionally, through the integration of automatic real estate maps, topographic maps and the integration of nature preservation areas the *Transmission GridMapper* can be used for the optimized planning of new railways and for the asset as well as risk management.

The *BGI Transmission GridMapper* is an innovative and secure multi-place browser solution for the high-security intranet, which can be used seamlessly in all technological control centers and departments for incident management and maintenance, for the development, the property securement and asset management.

50Hertz Transmission GmbH



50Hertz is responsible for the operation, maintenance, development and expansion of the 380/220-kilovolt power transmission network in the North and East of Germany. The network covers an area of 109.000 km² and has a length of about 9.750 km. It enables the network integration of about half the installed wind energy in Germany. 50Hertz arranges a secure power supply for more than 18 million inhabitants – 24 hours a day, 7 days a week, 365 days a year.

The key component of 50Hertz is the “Transmission Control Center” near Berlin: The employees in the control center operate and regulate the transmission network in close cooperation with neighboring German as well as European transmission system operators in the network alliance ENTSO-E.

<http://www.50hertz-transmission.net/>