

Measuring power lines in the Swiss mountains



TOPCON
AT WORK

“40 Masts over 22 kilometers”

“Half meter accuracies”

The NOK, Nordostschweizerische Kraftwerke AG operates a 380kW power line from Bonaduz in the canton Graubünden to Breite in the canton Zürich, Switzerland. The positions of some 400 masts of this line are only vaguely known. “For negotiations for the new line-contracts these positions had to be determined as exactly as possible and at a fair price. Because the masts are partially in areas that are difficult to access or in densely wooded areas, working from the ground was not really an option”, Urs Federer, director of the measurement department of the NOK states.

“Therefore I decided to use a helicopter.” On the 12th of September 2006 a helicopter equipped with a GPS and GLONASS Topcon hiper receiver, flew from the airfield Mollis for a measurement test flight. “Already on the flight to the starting position the reception of the correction data from the VRS-net was ensured.”

The flight put high demands on the pilot and all those in the helicopter. “For the measurement, the GPS receiver, which was fastened to the right skid of the helicopter, had to be held in position as perpendicularly as possible about two meters above the top of the mast. No easy venture, as the helicopter was shaken heavily by its own down-winds.” Jack Germann of Swiss Topcon dealer Fieldwork, was also there: “My task was to observe the position accuracy and to make the measurement at the correct moment. The most difficult task however was to keep the stomach under control.”

Federer continues: “Some masts which stood in very tight and deep cut valleys could not be measured, because we lacked a sufficient number of satellites. Of all 40 measured masts, over a distance of 22km, approximately 50% had an accuracy of half a meter or even better. The remaining points were within the demanded accuracy and in four cases were scarcely over it. The method met both the economic and accuracy requirements.”

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