



EXCOUNT-II

Advanced monitoring equipment for valve conductors

ABB's product, EXCOUNT-II, is an advanced but user-friendly device for effective, reliable and secure monitoring of valve conductors in an electrical power grid. The equipment consists of a meter which registers the number of current pulses, categorises amplitudes and even indicates when these occur. A hand-held unit takes readings and a computer system analyses the information which, for example, shows the number of lightning strikes in the equipment. Every section is developed by Creator in close cooperation with ABB.

The project:

The origin of the project was a measuring method which ABB had developed for establishing the status of the valve conductors by analysing the third tone in the current through the conductor, together with the third tone in the voltage during normal operation. Furthermore, they wanted to combine this with a registration of the currents between 10A and 10,000A, everything would be remotely read and the information would be compiled and evaluated through PC-based software. Creator's job was to build a product relating to the measuring method. This entailed a solution with a technically refined product which could withstand extreme cold, high temperatures, high currents, be immune to external disturbances, give high precision and furthermore be able to be produced at a low cost.

The project also included the supply of a database with relevant analysis tools. An important requirement was that the product's design should be suitable for field workers and be operational, among other things, by someone wearing gloves. This meant, for example, that the placement of the buttons and functions was important.

The solution:

Creator's project team realised quite early that the meter's electrical supply would be a challenge since this would be placed quite inaccessibly on poles in the switch tower.

"We had to find a solution for the meter's electrical supply which wouldn't need any maintenance at all. The solution was to use solar cells, but also the electrical field which furthermore determined the sensors design," explained Ulf Frank, Project Manager at Creator.

The solution with solar cells and power from the electric field however meant that the product's power consumption had to be very low.

"As the product's price could not be too high, we had to find operationally reliable components with very good economy which could still withstand the tough conditions out on the signal tower," continues Ulf Frank.

The communication between the meter and the read-out unit would be wireless and cope with a relatively long distances between transmitter and receiver. According to Ulf Frank, one problem was guaranteeing a clear transfer of the signal.

"The development work required close cooperation between the manufacturer of the radio circuit and the antenna specialist." The biggest problem was getting sufficient clarity in the signal, in part due to the long distance between the meter and the hand unit, but also due to external disturbances.

The meter's vulnerable placement out on the signal tower also put a lot of demand on resistance to weather and wind. The meter had to withstand a temperature range between -40 and +60 °C but at the same time not be too expensive to



produce. Furthermore, the meter would have to withstand the strong electrical fields to which it would be exposed on the signal tower.

“One particular challenge was the extremely high current powers which the meter would withstand which placed extreme demands on EMC security.” Its shelf life would also have to be at least 20 years, which is unusual for a plastic product in an outdoor environment. This meant that the sensor was also filled with silicon rubber in a vacuum chamber in order to ensure a long shelf life.



The result:

EXCOUNT-II has become a best seller for ABB. The high operational reliability and unique functionality in combination with an advantageous price has allowed ABB to reinforce its position in this area of business. EXCOUNT-II has basically become a sales argument.