2. The EMF conversion from the sensor output in a unipolar signal, followed by the separation of the subfrequency equal to the rotor frequency allows to determine turn-to-turn short circuit rotor winding.

3. The experiments have shown the developed device is able to determine the closure of the synchronous generator 4% rotor windings.

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SMART METER

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First, let's talk about the main disadvantages of the traditional meters. Traditional meters measure the total amount of consumed electricity and do not provide information about what happened when consumption was. With the transition from state regulation to market relations in the field of electric power production and other community resources, government inspection have looked for a means to match consumption and production of electricity and other resources. One of these solutions became the smart meters.

A smart meter is usually an electronic device that records consumption of electric energy in intervals of an hour or less and communicates that information at least daily back to the utility for monitoring and billing purposes. Smart meters enable two-way communication between the meter and the central system. Unlike home energy monitors, smart meters can gather data for remote reporting. Such an advanced metering infrastructure differs from

traditional automatic meter reading in that it enables two-way communications with the meter.

The term Smart Meter often refers to an electricity meter, but it also may mean a device measuring natural gas or water consumption.

Similar meters, usually referred to as interval or time-of-use meters, have existed for years, but "Smart Meters" usually involve real-time or near real-time sensors, power outage notification, and power quality monitoring. These additional features are more than simple automated meter reading (AMR). They are similar in many respects to Advanced Metering Infrastructure (AMI) meters. Interval and time-of-use meters historically have been installed to measure commercial and industrial customers, but may not have automatic reading.

Research by Which?, the UK consumer group, showed that as many as one in three confuse smart meters with energy monitors, also known as in-home display monitors. The roll-out of smart meters is one strategy for energy savings. While energy suppliers in the UK could save around £300 million a year from their introduction, consumer benefits will depend on people actively changing their energy use. For example, time of use tariffs offering lower rates at off-peak times, and selling electricity back to the grid, may also benefit consumers.

The installed base of smart meters in Europe at the end of 2008 was about 39 million units, according to analyst firm Berg Insight. Globally, Pike Research found that smart meter shipments were 17.4 million units for the first quarter of 2011. Visiongain has determined that the value of the global smart meter market will reach $7bn in 2012.

Smart meters may be part of a smart grid, but alone, they do not constitute a smart grid.

Possibility of Smart Meter: reading, accumulating and storing the information in real time; warning of energy losses; monitoring the quality of public resources.

Of all smart meter technologies, one critical technological problem is communication. Each meter must be able to reliably and securely communicate the information collected to some central location. Considering the varying environments and locations where meters are found, that problem can be daunting. Among the solutions proposed are: the use of cell and pager networks, satellite, licensed radio, combination licensed and unlicensed radio, and power line communication. Not only the medium used for communication purposes, but also the type of network used, is critical. As such, one would find: fixed wireless, mesh network or a combination of the two. There are several other potential network configurations possible, including the use

of Wi-Fi and other internet related networks. To date no one solution seems to be optimal for all applications. Rural utilities have very different communication problems from urban utilities or utilities located in difficult locations such as mountainous regions or areas ill-served by wireless and internet companies.

In addition to communication with the head-end network, smart meters may need to be part of a Home Area Network which can include an In-Premise Display and a hub to interface one or more meters with the head end. Technologies for this network will vary from country to country but include Power line communication and ZigBee.

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