British innovation avoids electricity blackouts

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A UK based product design company have developed a system which avoids blackouts in the electricity distribution industry by 'listening' for early signs of failure. They have produced a portable monitor which can detect the phenomenon known as 'partial discharge' well before a catastrophe occurs.

Partial discharge is identified as the major cause of failure in the electricity distribution industry. It is an electrical discharge which damages high- and medium-voltage contacts (10kV upwards) by causing the air to dissociate into nitrogen and oxygen, and then recombine as nitric acid. Over time supply equipment corrodes away; the end result for the consumer is that the lights go out, and for the supplier, emergency maintenance has to be undertaken. Partial discharge occurs as a result of ageing, operational stresses and minor imperfections in equipment manufacture, and it becomes more significant with time. Without information on the condition of contacts, electricity companies use expensive routine time-interval maintenance which is both expensive and of indeterminate quality.

The company have been involved for many years designing industrial instrumentation, particularly using ultrasonic technologies to detect processes such as mechanical wear, high pressure leaks and electrical insulation breakdown. Applying this knowledge to the phenomenon of partial discharge (PD), E2L has developed a unique monitoring instrument for electricity generating and distributing companies, specifically for the management of PD-driven maintenance.

Close working with UK-based power distributors (Power systems plc and AWE plc) has proven ultrasonics to be a successful solution over other methodologies. The ULTRASCAN monitor increases both electricity supply integrity and customer satisfaction, and improves maintenance quality and reduces maintenance cost. The innovative translation of E2L's knowledge base to this particular problem has solved a long-term detection problem as well as providing radical cost savings in the maintenance operations of electrical supply plant.

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