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Sun Sets on Bradwell Power Station

Located in South East England, close to the Essex coastline, Bradwell, a twin Magnox reactor, is undergoing decommissioning following shutdown in March 2002 after 40 years of operation. During its lifetime, the site generated nearly 60 TWh of electricity.

The station is following an accelerated decommissioning programme and is now more than halfway through a schedule of work which should see it become the first reactor in the UK to enter Care & Maintenance (C & M) in 2015. This means that any sites and structures that remain will be kept in a passively safe and secure state for a great number of years in order to allow radiation levels within buildings such as the reactor safestores to decay naturally over time, resulting in simpler and more effective decommissioning at final site clearance.

A major international engineering and construction group was contracted via a framework agreement to carry out Fuel Element Debris (FED) Dissolution at the station. FED is cladding from around the spent fuel, which is made from an alloy of magnesium and aluminium, known as magnesium non-oxidising (magnox) alloy, giving its name to the Magnox class of nuclear reactors. The contract covered plant design and the procurement of equipment to construct, operate and refurbish the site. As part of this project, ABLE Instruments & Controls Ltd was commissioned to supply a large process control instrumentation package comprising the following:

- **41** Temperature Transmitters
- **26** Pressure Transmitters
- **23** Vibrating Level Switches
- **20** DP Transmitters
- **18** Air Header Manifolds
- **12** Magnetic Flowmeters
- **10** Hydrogen Analysers
- **6** Ultrasonic Level Transmitters
- **5** Conductivity Analysers
- **4** Pressure Regulators
- **3** Coriolis Flowmeters
- **3** Hydrostatic Level Transmitters
- **2** RF Admittance Level Transmitters
- **2** pH Analysers
- **2** VA Flowmeters
- **2** Averaging Pitot Flow Elements
- **2** Restriction Orifice Plates
- **2** Pressure Gauges
- **1** NOx Analyser
- **1** Fixed Volume Sampling System
- **1** Redox Analyser
- **1** Guided Wave Radar Level Transmitter
- **1** Remote Indicator

Equipment destined for deployment in “Red” areas where incident radiation fields were relatively high had to have the nuclear industry’s specific safety benchmark, Emphasis approval.

Material considerations for certain instruments were also critical as some aspects of the process involved the Nuclear Decommissioning Authority (NDA) approved continuous, mercury catalysed nitric acid dissolution of uranium-aluminium alloys which comprised the reactor fuel elements, a method that will take about 15 months as compared to 18 years using the more commonly adopted carbonic acid process.

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