

# EDF Energy mobile ion exchange plant avoids costly downtime, UK Power | Case Study

## The Client

EDF Energy owns and operates 15 nuclear plants at eight nuclear power stations in the UK. These stations have a combined capacity of just under 8,800MW – about 10% of the UK's total installed electricity generation capacity from all energy sources, which comes to about 85,000MW. Their Hunterston B Nuclear Power Plant at West Kilbride on the west coast of Scotland started generation in 1976, and its two advanced gas cooled reactors are capable of generating 890MW of electricity, sufficient for 1.7 million homes.



## Key Figures

- Station downtime cost £1m per day
- Mobile plant provides additional make-up water required for start-up
- Mobile plant provides cover for on-site water treatment plant for planned maintenance or breakdown

## The Client's Needs

The nuclear reactor cores reach a temperature of over 600°C and the heat is transferred by carbon dioxide coolant into steam generators which operate at 60bar. The steam drives turbines to generate electricity before being condensed back into water and returned to the steam generators. At such high operating pressures, steam and water purity is critical and the make-up water to the steam generators has to meet a conductivity of <math><0.1\mu\text{S}/\text{cm}</math> and silica concentration <math><10\mu\text{g}/\text{l}</math>. An uninterrupted supply of high purity water is vital to the continuous operation of the power station, and its loss would result in a station shutdown. The loss of revenue, should this occur, is estimated at £1m per day. Station Chemist, David Davidson, wanted to ensure that water of the required quality and quantity would always be available, and he consulted Veolia's Mobile Water Services team.

## The Solution

Veolia has a fleet of mobile water treatments systems which can be deployed in a matter of hours for emergency or planned use.



The Mobile Water Services team identified that a MODI 15000 trailer mounted ion exchange plant would meet EDF's needs and set up a plan to provide the necessary cover. It houses two cation-anion-mixed bed ion exchange streams which can deliver 150m<sup>3</sup>/h of deionised water. When the resin beds are exhausted the trailer is returned to Mobile Water Services central regeneration facility so there is no impact on the station's chemical system or effluent plant. David is pleased with the result: "We regularly use Veolia's Mobile Water Services for planned maintenance activities and the trailers always perform to spec. I have a great relationship with the Mobile Water Services team and no request is too much trouble for them."

## The Benefits

- Mobile Water Services mobile plant available at short notice
- Cover for planned maintenance and start-up
- Off-site regeneration