

West Burton Power Station, Nottinghamshire



Cooling tower C1 (middle back)



Preparing the concrete surface



Cutting Kevlar[®] fabric prior to wet lay up



Work inside the tower was from cradles



Applying the Kevlar[®] fabric



Protective polyurethane coating

World-first in cooling tower strengthening using over eight kilometres of aramid strip in an innovative fibre reinforced polymer (FRP) composite design.

Client:	TXU Europe Power
Consulting Engineer:	Babtie
Principal Contractor:	Bierrum
Specialist Contractor:	Balvac
Project Value:	£365,000
Programme:	July – September 2000

The owners of West Burton Power Station, near Retford in Nottinghamshire, had been monitoring cooling tower C1 because it showed signs of distress caused by wind loading.

The 104m high cooling tower had been strengthened in 1975 by application of a mantle shell plus additional foundations, but over time this original strengthening scheme had proved to be inadequate.

An innovative solution to the continuing problem of the tower was required. Scheme development centred on a reinforced concrete ring beam solution, which had previously been used successfully in South Africa.

To improve the spread of loads in the original shell and mantle it was decided to use fibre reinforced polymer (FRP) composites on the inner face at the levels of the outer ring beams. The aramid system Mbrace[®], which uses the DuPont Kevlar[®] material, was selected.

Access to the inside of the tower was by suspended cradles. The concrete surface was initially prepared by grit blasting, the 8 km of aramid strips were cut to length and adhesive applied in a wet lay up process at ground level prior to being bonded to the concrete surface from the cradles. Finally a polyurethane protection coating was applied.

An extensive programme of trials, testing and training was carried by Balvac out at ground level prior to work commencing, to ensure that a high quality application process was developed for this world-first application of FRP in cooling tower strengthening

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