WEG delivers pumping efficiency to new £17m Dee Valley Water treatment works
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Dee Valley Water (DVW) has now completed its flagship water treatment works at Llwyn Onn, where the new facility is capable of producing 47,500m³ of potable water per day. Opened in March 2014 by the Minister for Natural Resources and Food, Alun Davies, the site’s pumps and compressors are predominantly powered by WEG motors, which have fulfilled the criteria for a number of applications and suppliers.

DVW serves approximately 258,000 customers in an 831 km² area of North East Wales and North West England and currently supplies 23 million tonnes of water per year. The new facility at Llwyn Onn also includes rapid gravity filtration (RGF) to reduce the levels of manganese, a mineral that occurs naturally in the surface water in the area. The main contractor for this project was Black & Veatch, the company has a design office close by in Chester and the majority of the construction and installation work was completed by local contractors. This close proximity of the involved parties improved the sustainability of the project as well as improving communications between the design team and the installation and construction engineers.

The water treatment process consists of dissolved air flotation (DAF) clarification, granular activated carbon (GAC) filtration followed by rapid gravity filtration (RGF) and a chlorine contact tank before being pumped to a storage reservoir - from where it is fed into the distribution network. These processes require pumping
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Allan Reef,
Capital Programme Manager,
Dee Valley Water
systems not only for transporting the water but also for backwashing and recycling the filter systems.

The original equipment manufacturers (OEMs) responsible for the water treatment equipment were at liberty to select any brand of motor provided that it met the efficiency and reliability criteria as well as WIMES (Water Industry Mechanical and Electrical Specification). Interestingly the vast majority of motors on the site are manufactured by WEG, including those powering the air compressor units.

Originally introduced to reduce costs across the water industry by providing a common standard, WIMES is also a means of reducing the whole life costs of equipment such as low voltage electric motors. WIMES achieves this by specifying minimum criteria for features such as energy efficiency, power factor, build quality and environmental protection, all of which can affect a company's profitability.

The importance of WIMES as a whole life cost reduction tool is clear when the ratio of the initial cost of low voltage motors is compared to their operating costs. It has been calculated that in high use cases – and the water industry has many of these - the purchase cost
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of an LV motor can represent as little as 1% of the motor’s lifetime cost; the remaining 99% being attributable to the motor’s energy consumption.

The W22 WIMES line is available in two versions, both backed by a 3-year warranty, and both designed to exceed the requirements of the IE2 (High) and IE3 (Premium) efficiency classes. Importantly, the IE3 Premium Efficiency versions of the motors are available, in standard IEC frame sizes, well in advance of the Energy using Products (EuP) Motor Regulations due for implementation in 2015/2017.

The three low lift pumps on site are powered by WEG W22, 110 kW, IE2 motors that offer a 95% efficiency rating, while the backwash and recycle pumps are powered by similar 90 kW and 75 kW motors respectively; with both offering an efficiency rating above 94%. Even the de-sludge pumps on the new lamella separator are powered by 1.5 kW WEG motors.

Allan Reef, Capital Programme Manager for Dee Valley Water, comments: “This has been a virtually clean sheet design where the procurement process has ensured that the most energy efficient equipment has been installed. The motors from WEG have performed well and an ongoing study into the operational energy efficiency of the site is expected to demonstrate that the motors have been running to expectation.”

Phil Hall, Industry Manager for WEG, comments: “The W22 WIMES motor is specifically designed to tick all of the specification boxes for operation in the water treatment industry. Design engineers and OEMs can save time in preparing specification documents and be confident that WEG can deliver whatever the requirement, from stock. A large range of our LV motors are even available in super efficient IE4 energy compliant spec.

‘The stock aspect is critical; although the design and specification process is often drawn out on these projects, the fact that we can supply the motors to outdoor, or indoor specification, in vertical or horizontal mounting position from fractional kilowatt power ratings, right up to three hundred kilowatt plus, from stock, held in the UK, makes the job of the designer and the contractors much easier.”
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WEG Worldwide Operations

ARGENTINA
San Francisco - Cordoba
Phone: +54 3564 421484
info-ar@weg.net

Cordoba - Cordoba
Phone: +54 351 4641366
weg-morbe@weg.com.ar

Buenos Aires
Phone: +54 11 42998000
ventas@pulverlux.com.ar

AUSTRALIA
Scoresby - Victoria
Phone: +61 3 97654600
info-au@weg.net

AUSTRIA
Markt Piesting - Wiener Neustadt-Land
Phone: +43 2633 4040
watt@wattdrive.com

BELGIUM
Nivelles - Belgium
Phone: +32 67 888420
info-be@weg.net

BRAZIL
Jaraguá do Sul - Santa Catarina
Phone: +55 47 32764000
info-br@weg.net

CHILE
La Reina - Santiago
Phone: +56 2 27848900
info-cl@weg.net

CHINA
Nantong - Jiangsu
Phone: +86 513 85989333
info-cn@weg.net

Changzhou – Jiangsu
Phone: +86 519 88067692
info-cn@weg.net

COLOMBIA
San Cayetano - Bogota
Phone: +57 1 4160166
info-co@weg.net

ECUADOR
El Batan - Quito
Phone: +593 2 5144339
ceccato@weg.net

FRANCE
Saint-Quentin-Fallavier - Isère
Phone: +33 4 74991135
info-fr@weg.net

GERMANY
Türnich - Kerpen
Phone: +49 2237 92910
info-de@weg.net

Balingen - Baden-Württemberg
Phone: +49 7433 90410
info-weg-antriebe.de

Homberg (Efze) - Hesse
Phone: +49 5681 99520
info@akh-antriebstechnik.de

GHANA
Accra
Phone: +233 30 2766490
info-in@weg.net

INDIA
Bangalore - Karnataka
Phone: +91 80 41282007
info-in@weg.net

ITALY
Cinisello Balsamo - Milano
Phone: +39 2 61293535
info-it@weg.net

JAPAN
Yokohama - Kanagawa
Phone: +81 45 5503030
info-jp@weg.net

MALAYSIA
Shah Alam - Selangor
Phone: +60 3 78591626
info@wattdrive.com.my

MEXICO
Huehuetoca - Mexico
Phone: +52 55 53214275
info-mx@weg.net

Tizayuca - Hidalgo
Phone: +52 77 97963790

NETHERLANDS
Oldenzaal - Overijssel
Phone: +31 541 571080
info-nl@weg.net

PERU
La Victoria - Lima
Phone: +51 1 2097600
info-pe@weg.net

PORTUGAL
Maia - Porto
Phone: +351 22 9477700
info-pt@weg.net

RUSSIA and CIS
Saint Petersburg
Phone: +7 812 363 2172
sales-wes@weg.net

SOUTH AFRICA
Johannesburg
Phone: +27 11 7236000
info@zest.co.za

SPAIN
Coslada - Madrid
Phone: +34 91 6553008
wegiberia@wegiberia.es

SINGAPORE
Singapore
Phone: +65 68589081
info-sg@weg.net

UK
Redditch - Worcestershire
Phone: +44 1527 513800
info-uk@weg.net

UNITED ARAB EMIRATES
Jebel Ali - Dubai
Phone: +971 4 8130800
info-ae@weg.net

USA
Duluth - Georgia
Phone: +1 678 2492000
info-us@weg.net

Minneapolis - Minnesota
Phone: +1 612 3788000

VENEZUELA
Valencia - Carabobo
Phone: +58 241 8210582
info-ve@weg.net

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