

# Water Services World

Autumn 2009

## Tested to perfection

### WSG expands its underwater testing facilities

Following a successful move to new premises last year The Water Services Group has finished commissioning new test facilities, including a full size testing tank and a high pressure chamber for depth rating individual components.

The tank will allow full sized Pipe Inspection Vehicles (PIVs) and Remote Operated Vehicles (ROVs) to be checked for buoyancy, maneuverability and sensor functions before deployment to project sites.

By pressure testing individual components working at simulated depths of up to 500 metres, with a variety of water conditions, greater reliability and performance is ensured.

"These new testing facilities allow us to speed up the research and development process" said Tom Bonner, Chief Design Engineer at The WSG laboratory in Enfield, London. "They also ensure prototype equipment performs as expected on-site, and our clients can see the benefit in terms of faster delivery time while we carry out surveys and other work."

The first vehicle to use the tank was the new PIV-M1 designed for a 3km long tunnel inspection in France.

The pressure chamber is currently being used as part of the ongoing development and improvement of maneuvering thrusters.



A message from  
Paul Hope-Darby

Managing  
Director, The  
Water Services  
Group

*So far 2009 has been a remarkably busy year for The Water Services Group. As well as completing a number of complex and challenging international projects - from underwater repairs in the Indian Ocean to tunnel inspections in the French Pyrenees - we have also been hard at work improving our inspection and testing capabilities.*

*I'm particularly excited by the development of our unique fleet of modular ROVs which can be easily configured with a variety of sensors and testing equipment to suit client-specific applications. The ability to be able to solve our clients problems efficiently and effectively is very important to us here at The Water Services Group.*

*As a company we continue to focus on delivering unique services, and our strong research and development investment will ensure we maintain our status as the pioneers of long distance pipe inspection.*

## Diving the Indian Ocean

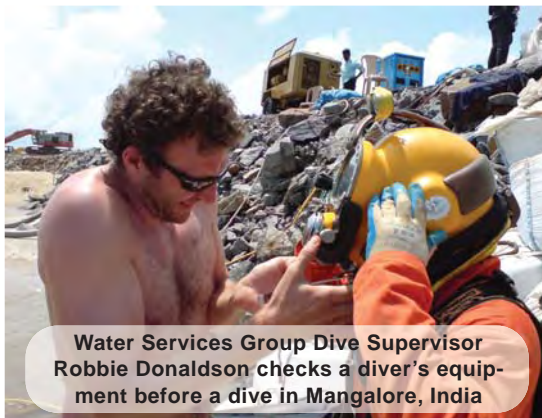
### Coolant pipe repairs at GMR Energy, Mangalore

It may sound like the ideal holiday, but members of the two dive teams WSG sent to Mangalore, Southern India, found themselves working hard to overcome the challenges of a major pipe repair.

Following a PIV pipe survey completed earlier in the year, The Water Services group returned to GMR Energy Ltd in May 2009 to carry out repairs on the coolant intake pipe supporting a 220MW barge-mounted power plant.

A recent shipwreck on the coast nearby had damaged sections of the pipe, and large quantities of sand were being inducted, threatening to damage the heat exchangers. WSG sent two five-man dive teams, supported by a PIV inspection team, to repair damaged sections of the pipe.

"Our biggest worry was the deteriorating weather" comments Anthony Robertson, Project Manager for the repair job. "The monsoon season was fast approaching, and we had to get the work finished and the pipe closed before sea conditions made diving too dangerous."



Water Services Group Dive Supervisor  
Robbie Donaldson checks a diver's equipment before a dive in Mangalore, India

As well as working from a barge, repairs were carried out from the protection of a specially constructed breakwater built to shelter the work site, a feat of local engineering by GMR.

Despite a few early storms, the repairs were completed successfully, allowing the power plant to start generating again.

Following the completion of the project, The Water Services Group has used the experience to refine pipe repair techniques, resulting in a new, patented method for carrying out permanent structural repairs from the inside of pipes and tunnels.

### 2009 Projects in Brief...

#### Mersey crossing - April Client: United Utilities

A confined space entry job involving Non-Destructive Testing (NDT) of the drinking water pipes within a victorian-built cast-iron tunnel under the river Mersey.

#### Farmoor Water Treatment plant - June Client: Thames water

Micro-ROV survey of the ozone injectors at the Farmoor Water Treatment Works.

#### Dungeness power plant - September Client: British Energy

Long distance PIV survey of the coolant water pipe and diffuser at the Dungeness 'B' nuclear power plant.

...and many more

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The pioneers of long-distance internal pipe inspection

**COMPANY NEWS**

**Mark Harris joins WSG as Operations Manager**



August of 2009 saw Mark Harris take up his new role as Operations Manager for the Water Services Group.

Previously IT manager for a FTSE 250 company, Mark brings his formidable technical and organisation skills to WSG where he will work from the Enfield head offices to support both R&D and client projects.

"Working for Water Services is a totally different experience," said Mark. "I'm really excited by what the company does, and I will be working hard to improve efficiency and help manage our continuing growth."

**Listening for Leaks**

**A joint venture R&D project with EDF and Advitam**

This summer The Water Services Group undertook an ambitious Research and Development project as a joint venture with energy giant Electricité de France (EDF) and inspection and monitoring specialist Advitam of France.

The culmination of the research project was a trip to the Pyrenees to demonstrate the technologies' potential at EDF's Nentilla hydro-electric plant near Axat, France.



ROV supervisor Ken Shimmin (left) and ROV technician Rodney Springer with the PIV-M1 at the Nentilla hydro plant, France

Just getting to the remote job site was a major logistical effort, and involved moving tonnes of equipment 3km up steep mountain side to the surge chamber where the transfer tunnel enters the penstock.

Once on site, the WSG team had to overcome a number of problems, including getting the large PIV through a 1m square access hatch. "We've effectively had to completely rebuild the PIV on site" said ROV Supervisor Ken Shimmin. "We have a fantastic team here, and they have worked very long hours to make this project a success."

Although a very broad-scope project, one key aspect was the development and integration of ground-breaking new hydrophone technology which can be used to listen for leaks within pipes and tunnels.

Navigating against a fierce flow, and in very poor visibility conditions, the PIV-M1 nevertheless managed to successfully identify a number of leaks within the rock-walled water transfer tunnel, including a major leak that EDF had not been aware of previously.

Developed by Advitam, and fitted to WSG's new PIV-M1 for its maiden voyage, this technology allows even very small leaks to be detected and accurately located and quantified within pipes up to 3km long.

WSG is continuing to work with both Advitam and EDF to refine the techniques demonstrated at Nentilla, and will be making the service available to other clients soon.

**Building the brains of the company**

**WSG adds three revolutionary new ROVs to the fleet**

The existing Water Service Group fleet of ROVs has grown with the addition of three new, fully modular, vehicles.

These new brains bring a number of additional capabilities. As well as controlling a greater number of more powerful thrusters and manipulators, they can interface to a wide range of new sensors, including ultrasonic thickness testing, eddy current pipe testing and ground probing radar equipment to enhance our pipe testing capabilities.

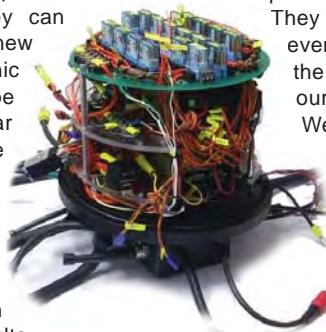
Paul Hope-Darby, Managing Director, said "These new ROVs are the most important development for WSG this year.

Designed and built entirely in-house, and over a year in development, these new ROVs can be rapidly reconfigured as Pipe Inspection Vehicles (PIVs) for pipe diameters as small as 40cm, or set up as open-water ROVs for sea or fresh-water applications.

The modular design also allows the entire electronics assembly to be quickly and easily swapped out on site, reducing down-time in the unlikely event of electronic faults.

They will allow us to be even more flexible with the range of tasks that our PIVs can carry out.

At the heart of the new design is the electronic 'brain' which allows the vehicles to be fully controlled from the surface.



We are still discovering new applications for them, and the improved reliability will allow us to continue to deliver our promise of total client support."

**The Water Services Group Provides a range of complimentary services:**

**Diving**

As an HSE registered Diving contractor and full member of the Association of Diving Contractors (ADC) with over 20 years experience in complex civil engineering projects, WSG provide the definitive range of services from structural integrity testing to complex underwater construction and repair services.

**Internal Pipe Inspection**

Using our unique fleet of pipe inspection vehicles, The Water Services Group provide a total pipe inspection, testing, cleaning and refurbishment service for pipes, tunnels, aquaducts and outfalls varying from 150mm to 6m in width, and can survey for distances in excess of 20km from a single launch hatch.

**Confined space entry**

We operate teams of qualified and highly experienced operatives to carry out tasks including non destructive testing, CCTV inspection, cleaning, refurbishment and structural repairs on locations including water towers, subterranean chambers, tunnels, pipes, sewer treatment works, chemical tanks and contaminated environments

**Non-destructive testing**

We combine technologies including: Ultrasonics, Eddy-current and Magnetic flux leakage

- For remote internal pipe inspections and testing mounted on PIVs
- For underwater structure analysis by divers
- For structure and pipe testing within confined spaces by C.S operatives

