

**In 2004, KWH Pipe supplied several kilometres of large-diameter polyethylene drinking-water pipework for the new water treatment works which supplies 700,000 people in the city of Glasgow, Scotland. Only one piece in the puzzle still remained to be solved.**

# Katrine water project

Scottish Water's main contractor, M.J. Gleeson (now part of the Black & Veatch Group), had to decide how to install the main large-diameter supply pipework between the treatment works and the huge storage tank at Bankell, in an area of outstanding natural beauty, which is in constant use by members of the public.

KWH Pipe, in conjunction with the engineers from Gleeson's, hit upon the novel idea of laying the water supply pipes (2 x twin lines) across the bed of the Mugdock reservoir – something that had never before been tried with large-diameter pipes in the UK.

After months of design and planning work, the operation finally took place in late summer 2006.

Gleeson and their welding contractor (A.G. Wilson), set up a pre-fabrication area at the northern edge of the reservoir to butt-fusion weld the pipe into long strings, and at the same time to attach large concrete weights to the pipe before the welded



pipe with the weights attached, was floated out onto the reservoir prior to submersion.

The 2 x twin lines were then towed into their separate positions to await submersion.

With the assistance of KWH Pipe's engineers, Gleeson's own pipeline engineers began sinking the first twin pipeline over a slightly shorter crossing. This was successfully completed in one afternoon.

The sinking of the longer twin pipeline, commenced the next morning and the operation was completed later the same day.

During submersion, divers were used to ensure that the pipes settled evenly on the bed of the reservoir, which, although it had been surveyed, had not actually been seen since it was constructed over 150 years

ago. Rumours of the remains of several old houses on the bed of the reservoir were, happily, unfounded.

This innovative idea, thought up by KWH Pipe and Gleeson, saved disruption to a particularly beautiful area of the Scottish countryside and offered an economical and practical solution to an otherwise extremely difficult pipeline installation through the causeway of the reservoir.

M.J. Gleeson (now Black & Veatch), is probably the only company with experience of installing large-diameter polyethylene pipework in the whole of the UK and there is now evidence to show that the partnering arrangement with KWH Pipe, now going back over a period of several years, can provide practical and cost-effective solutions to a range of pipework installations. ●

A few years ago, a leak problem emerged in the plastic pipes owned by Vodokanal, the St. Petersburg firm that is the equivalent of a municipal water board. Closer inspection of the leaks revealed that they were caused by breaks in the butt welds where the polyethylene pipes are joined together.

Vodokanal first suspected that the pipes were faulty, but more careful inspection revealed that the problem stemmed from the welding methods used.

“We offered to help Vodokanal resolve the problem with training, as we have the necessary welding expertise,” says Tapio Alanen, marketing manager at KWH Pipe Technology.

The first butt-welding course arranged by KWH was held in late 2006, and three of the three-day courses have been held for Vodokanal welders so far, with 15 people taking part in each.

#### **STRICT THEORY AND PRACTICAL WELDING EXERCISES**

The principal instructor on the welding course was Hannu Heikka from the Hyvinkää-Riihimäki Vocational Adult Education Centre, who has been training welders for over 20 years. Heikka has three assistant instructors and an interpreter to help him.

“The syllabus first covers the theory side, which deals with the study of materials, properties of plastic, pipe manufacturing technology, dimensions and markings, and the standards used in different countries. We also go through butt-welding techniques and delve into welding equipment and maintenance, and welding-pressure tables,” explains Heikka.

The second day of the course is used for various pipe-welding exercises followed by instruction in the use of welding tables and welding-equipment reporting units. In the evening, there is a strict theory exam to see whether the students have taken in the subjects studied on the first day. According to Heikka, the students have to take the theory side seriously in order to pass the exam.

## KWH Pipe organizes welding courses in St. Petersburg, Russia

# Training for Vodokanal welders

**KWH Pipe Technology is training welders at the St. Petersburg water company in butt-welding, to teach them how to weld to European standards. Besides a demanding theory section, the course syllabus includes practical welding exercises.**

“On the third day, there is an opportunity for the students to show what they can do. Each of the participants welds their own section of the sample pipe to produce a long pipe full of butt welds. The climax of the course is the tense moment when a pressure test is carried out on the pipe and the water pressure in the pipe is built up until it bursts. The students brace themselves to see where the pipe eventually fails – at one of their welds or at some point in the pipe itself. So far, the joints have not failed once,” says Heikka with satisfaction.

Each of the students is given a personal certificate with a number which they write beside every welded joint they make at work from that moment on. This means that all welding work is traceable.

#### **CLEANLINESS IS VITAL**

“The most important thing the students learn is that cleanliness is vital. Problems can be caused if the ends of the pipes are dirty or greasy. I also emphasize that good equipment on its own is not enough; whether or not you get a good result depends on the skill of the welder,” Alanen points out. •

