



Biopower plant receives record pipes

Plastic pipes with the largest diameter in Finnish history are being installed at the biopower plant that is under construction at Keljonlahti in Central Finland. The pipes are to be used as transfer lines for cooling water.

Jyväskylä's existing main power plant is becoming too small to meet the demands of the growing city. "Part of the existing equipment used in the power production will be removed due to tighter EU regulations. The new plant will generate energy sustainably using peat and wood," explains Project Manager **Pentti Huumo**, of the power company Jyväskylän Voima Oy.

The project has been in the planning stages for years, as the first plans were drawn in 2003-2004. The power company, that will be running the new plant, was formed in May 2006. Construction began with the felling of trees at the plant site in October 2007. "Considering the construction site, this one is pretty challenging. We've moved nearly a million cubic metres of soil," says Huumo.

Fragmental rock a surprise

According to the original plan, cooling water for the plant was to be drawn from nearby Keljonlahti Bay through a pipeline. The cooling water would be returned to the main body of Lake Päijänne via a rock tunnel measuring an approximately one kilometre-long.

When the bedrock and lakebed were analyzed, it soon became clear that the area would be a challenge. "We found that the bedrock was highly fragmental. The plan was to build a tunnel 80 metres below the surface of the lake," explains Huumo. The work began to look overwhelming. The tunnel would have run underneath the plant and the bay, and finally emerge from the tip of a neighbouring peninsula.

"On top of this, there is a large fuel depot nearby, and we didn't want to interfere with its operation. We had to come up with another plan," recalls Huumo.

Solution found on the Internet

The power company decided to run the cooling water through a 1.3-kilometre long pipeline laid on the lakebed to the main body of Lake Päijänne.

Because water flows through the line at a rate of 5–6 cubic metres per second, the pipe also had to be of substantial size. "After looking at Uponor Infra's website, it soon became clear that it is possible with pipes this big," says Huumo.

Steel pipe was initially also an option. After a tender process, Weholite pipe was chosen as the pipe material for the project. "The smooth exterior of the pipe is good for fishermen, because their nets won't get stuck on it," states Huumo. The Keljonlahti delivery included the design, welding, weighting and submersion of the cooling water pipes, as well as parts and equipment inspection.

Working group to fine-tune plans

A working group, which focused on handling the installation of the Keljonlahti pipeline was established. A plastic pipeline of this diameter has never been installed in Finland, so there was a lot of new ground to cover. The largest pipe diameter used at Finnish construction sites to date was 2.4 metres. This allowed the group to bring together know-how from a wide range of technical fields; the kind of know-how you'll find in an expert organization like Uponor Infra.

How will the pipe behave? What kinds of things need to be taken into consideration due to its large size? Worksite plans and directives are

affected by, for example, the size and weight of the pipe as well as the length of the welded sections and the challenges posed by submersion.

"I was certainly convinced when we received a visit from a Norwegian expert, with whom we went through the technical aspects of the project. This particular expert had written a textbook on plastic pipe and has practical experience working in the oil and gas fields of Norway. "This is the kind of input a customer appreciates," says Huumo.

Minimal dredging necessary

The route of the pipeline on the lakebed was established, and it was found to be relatively easy. The only dredging necessary was on the power plant shoreline, as well as on a stretch approximately 200 metres in length, where the discharge pipe is close to a channel. "Dredging was completed on New Year's Eve – we just had to add some finishing touches," Huumo explains.

An excellent staging point for the three-metre pipe was found near the power plant site, an old railway track that used to serve the logging industry. Small transfer cars were built so that the pipe elements could easily be moved.

Steady stream of pipes

During the whole spring a steady stream of pipes made their way from Vaasa to the shores of Lake Päijänne in Jyväskylä. "When we got to work in the morning, there were usually two truckloads of pipe waiting to be staged," explains Huumo. 20-metre pipes were welded together to form 300-metre sections.

The first pipe section, which was used for process water intake, was completed in January 2009. The pipes were welded together into sections and flange joints were welded on the ends. Then, the sections were lifted onto the ice to wait for the weighting. The installation of the pipeline on the lakebed began in May and it was estimated to be ready in early summer.

Weholite pipes for the Keljonlahti biopower plant

- » **The Weholite pipe was 3 000/3 330 millimetres in diameter.**
- » **One pipe length was 20 metres.**
- » **Pipes were welded into 300-metre long sections, i.e. 15 pipes joined end-to-end.**
- » **The overall length of the cooling water intake and discharge pipe was 1,714 metres.**



For further information about this project please contact: infofi@uponor.com