



A massive gas pipe system spans the pusher-type furnace.

Rautaruukki's Raahе Works coke gas controlled by Neles valves

The plate rolling mill's pusher-type furnace at Rautaruukki's Raahе Works was modernized last fall in record time. This involved the installation of Neles valves in the furnace's coke gas pipe system. The project was of considerable significance, as the installation comprised almost four hundred control and on/off valves. Tapani Seppälä, chief designer in the investments unit at Ruukki Metals, is very familiar with Neles, thanks to his 30-plus years in the business.

TEXT Tapani Leppänen

Ruukki's Raahе Works produces hot-rolled plate and coil products from ore and recycled steel. Annual production is 2.8 million tonnes, of which roughly half goes straight to customers and the rest goes for further processing, for instance to Ruukki's Hämeenlinna plant. The Raahе Works is Ruukki's largest production unit in Finland and employs around three thousand people.

The pusher-type furnace for crude steel at Raahе's plate rolling mill was renewed last fall. The original furnace and the production line date back to the 1960s. The old British-made furnace was dismantled completely and then rebuilt under the direction of the German company Maerz. "That must have been some kind of world record. In just five weeks we dismantled the old furnace, built a new one and completed

the start-up," recalls **Tapani Seppälä**, referring to the modernization contract undertaken during October and November.

Major valve delivery

The fuel for the pusher-type furnace used in heating the crude steel is coke gas, which is generated as a bi-product at the coking plant located nearby. The coke itself, which is produced from coal, is used as a material for charging the steelworks' blast furnace. Metso's valve delivery was destined for the furnace's coke gas piping, for the burners,



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and for the associated combustion air piping. In total, the delivery comprised approximately 370 control and on/off valves, most of them with a high heat tolerance.

Operating in the 450°C heat, the combustion air valves are required to be durable. There are also a significant number of environmental and other specific requirements for these and the other valves. For instance, the coke gas valves must have a fire safety classification and be gas-tight. One of the many innovative solutions for the valves concerns the functions they are equipped to perform.

“Based on our specifications, a combination valve was custom-made for us by Neles. It functions simultaneously as both a control valve and an emergency shutdown valve. Besides the great control properties, a one-second emergency shutdown feature was required, and the valve had to be fire safe and be controllable manually. Thanks to the design of this valve, we were able to achieve a significant saving in costs,” says Seppälä. The pneumatic actuator air is driven via a safety-certified emergency shutdown system, in which the Neles ValvGuard safety system constitutes the principal means of protection against gas combustion.

“Gas is a safe fuel as long as the combustion is controlled. Safety and reliability are based on risk analysis. The Neles ValvGuard system meets the required safety integrity level demands.”

Neles: familiar and safe

For Tapani Seppälä and the Raahe Works, Metso is a long-established partner. Seppälä remembers installing the first Neles valves in the 1970s. He estimates that throughout the steelworks, there are today some three thousand Neles valves. The Raahe personnel are therefore familiar with the Neles valves and, says Seppälä, the experience gained with the valves in demanding conditions has been reassuring. In terms of future procurement, he nevertheless considers that references citing favorable experience with corresponding



Rautaruukki's **Tapani Seppälä** and **Erik Filppula** together with Metso's **Veli-Pekka Meriläinen**.

applications elsewhere are more a prerequisite for a deal than an assurance of a deal. He adds that unless favorable experience can be cited for the use of particular valves, there is no prospect that they would be purchased for such demanding uses as those at Raahe, though he also stresses that acquisition of a new valve is always based on normal tendering procedures.

“We invite tenders from at least three suppliers, and on the basis of these, we purchase the best solution. We take into account price, quality and delivery performance as well as experience cited in the use of corresponding applications. Put another way, no supplier can succeed in this game if their price, quality and technology are not competitive,” he says.

Neles is competitive in all areas for which it has products, notes Seppälä. For the Raahe Works, it is also important that the supplier offers regional servicing and support, and if the product is Finnish-made, all the better.

Easy installation and start-up

Matters can be easily dealt with if there are contacts locally, says Seppälä. For Metso Endress+Hauser, the deal has been managed by **Veli-Pekka Meriläinen**, working from the Oulu office. He has been many years at the company, starting in Metso's automation systems.

Seppälä confirms that the level of service available has been good. The product support for the equipment comes from the Kemi local service unit and additional expertise from Helsinki. The startup was largely managed by the Raahe personnel themselves, and the Neles valves arrived ready-primed from the factory.

The tight construction schedule did present a challenge for the valve deliveries,

though this was helped by the fact that some of the valves were obtained for installation during the preliminary work stages. At the Helsinki end, Tommi Martikainen was in charge of delivery monitoring and the factory testing. Seppälä notes that the total delivery went according to plan.


“A small delay at the actual construction stage was caused mainly by a number of magnetic valves, which suffered damage at the installation phase. This was quickly resolved though, and no real problems arose.”

Neles brings synergy benefits

The large number of Neles valves at the Raahe Works brings important synergy benefits, for instance, the reduced need for spare parts. As Tapani Seppälä notes, this is evident in the maintenance costs of the valves.

“There is no need to invest huge sums in spare parts when all the basic products are available from the manufacturer's spare parts center in Kemi. For us, it is sufficient that our parts store holds a few of the more specialized valve-actuator combinations destined for critical locations.” Significant benefits are also obtained in the form of servicing and operating experience acquired over the years.

“Having products from the same manufacturer and of a similar design brings added value for us. The Neles valves are familiar to those who have worked with them.”

At Raahe's rolling mill, the Neles FieldCare system is used for managing field devices. The new coke gas piping valves have not yet been taken for condition monitoring, but as far as the equipment is concerned, this can be done at any time. Seppälä also considers it important that the current condition monitoring can also be expanded to the new furnace area. 

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