References

An optimal solution for a Polish power plant



Uponor involvement

- WehoSlurry pipes DE/ID 250/203 – 7200 m

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WehoSlurry polyethylene pipes with an additional, internal slurry layer, provided an optimum solution for hydrotransporting ash to the Bełchatów Power Plant's disposal site.
The 5.472MW Bełchatów Power Plant located near Bełchatów, in central Poland, is the world's second largest lignite-fired power plant. It is also the largest thermal power plant in Europe, and the second largest fossil-fuel power plant worldwide. The power plant is owned and operated by PGE GiEK Oddział Elektrownia Bełchatów, a subsidiary of Polska Grupa Energetyczna. In 2008, during the construction of technical maintenance facilities for a new 858MW power generating unit, Uponor Infra supplied about 3km of WehoPipe pressure pipes, with diameters ranging from 225 to 900mm, for the installation of raw water and preheated water systems. A few years later, in 2016, the Bełchatów Power Plant asked Uponor Infra to assist it in developing an ash hydrotransport system.

Project Facts:

Location
Bełchatów, Poland

Completion
2021

Vrsta objekta
Industrial

Product systems
Tailor made constructions, Industrial pipes

Project Type
New building

Partners

Investor:
PGE Elektrownia Bełchatów

Contractor:
Ramb

The ash problem

One of the byproducts of lignite (brown coal) combustion is ash, which is deposited by the Bełchatów Power Plant at the Bagno Lubień disposal site. Before 2010, the ash was dry stored. However, due to high dust emissions, the Power Plant had to switch to a wet storage system. In 2011, the Power Plant went ahead with preparations for the installation of an ash hydrotransport system and the disposal site's customization for this type of coal combustion waste. The hydrotransport system and wet storage technology helped to reduce dust emissions and increase the ash storage capacity.
The ash is transported to the disposal site in the form of suspension, i.e. a water-and-ash mixture in a 1:1 ratio. The main distribution lines leading to the disposal site are made of steel for greater resistance to the high temperature ash fed into the system upstream. Although the dusting problem was solved, another challenge lay in ensuring the mixture's uniform distribution over an area of 416ha, because the dense material becomes a hard shell once the water is removed.

The best solution

Uponor Infra participated in the technical dialogues alongside the investor (the Bełchatów Power Plant) and contractor (Ramb), and served as a specialist adviser. Ultimately, the decision was taken to use WehoSlurry polyethylene pipes with an additional, internal abrasion-resistant slurry layer for connection to steel pipes and the distribution of the ash mixture to the disposal site. Polyethylene pipes proved to be the best solution, given their resistance to corrosion and UV radiation in general, while their flexibility makes them suitable for dynamic environments, including low temperatures.
Around the disposal site, there were a total of 79 discharge points made of steel pipes to which the WehoSlurry pipelines were connected. ''A pipeline connection method is devised to enable the supply of the mixture to the centre of the disposal site and then – by reducing particular pipeline sections – its distribution towards the edges of the site, thereby achieving a uniform layer,'' explains Krzysztof Kobiałka, Industry Sales Manager, who represented Uponor Infra during the technical negotiations. ''The pipelines are then reconnected and another layer is poured into the centre,'' he adds. The 15-metre sections were installed using Victualic pipe jointing system, which allow the quick and easy assembly and disassembly of the piping system.
A total of 5km of WehoSlurry pipes, with a diameter of DE/ID 250/203mm and manufactured by Uponor Infra in Kleszczów near Bełchatów, were used for the project.
Use of WehoSlurry for transporting the very awkward water and ash mixture, and the possibility of repositioning pipeline sections to ensure the uniform distribution of the abrasive mixture, proved to be an optimum solution. This is confirmed by the power plant's maintenance department.

WehoSlurry piping system provided by Uponor Infra:

- Diameter: DE/ID 250/203
- Total thickness of the pipe wall: 23.5mm
- Thickness of the slurry layer: 8.7mm
- Thickness of the carrier pipe wall: 14.8mm

Parametres of the transported material

- Water-and-ash mixture in a 1:1 ratio
- Max. operating pressure: up to 6 bar

- Max. temperature: 30°C

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