

Nyrstar Port Pirie Transformation, Commissioning and Ramp-Up

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ABSTRACT

Nyrstar's Port Pirie operation is located 230km North of Adelaide and has been operating since 1889. It has undergone a transformation by replacing last century's sintering technology with top submerged lance technology. As expected in such a complex transformation, there have been many issues requiring solving in order to ramp up the new plant.

This paper discusses some of the issues encountered in the construction, commissioning and ramp up of the new top submerged lance furnace and acid plant technology, how they were overcome, the plant performance and the future capability of the transformed facility.

The new technology was installed to allow Nyrstar Port Pirie to operate into the future by reducing lead in air emissions to meet the current and future expectations of the community and regulatory agencies in Port Pirie and South Australia. This technology would also allow Nyrstar Port Pirie to treat less concentrates and higher amounts of residues to ensure the smelter operated profitably into the future.

The new top submerged lance furnace construction started in February 2015 and consisted of an Outotec top submerged lance furnace, hot gas cleaning and cooling process, a double contact sulfuric acid plant and other supporting infrastructure such as increased cooling water capacity, an oxygen plant and coal mill. Most of the equipment was built in modules, transported to Port Pirie by boat and constructed on site. The furnace was operational in October 2017 and the acid plant was commissioned in January 2018. Other issues requiring addressing before commissioning could be completed included removal of selenium and neutralisation of weak acid from the gas cleaning circuit.

The new plant has proven it can consume much higher quantities of residues than design, sustainably operating at over 90tph, 10% above the design rate with a significantly higher proportion of zinc leach residues to concentrates. Elements such as chlorides have been found to be deleterious to the process and must be limited in the feed.

Nyrstar is currently assessing different and new materials for treatment at Port Pirie to become a plant that recovers valuable base and precious metals and to provide a treatment route for other complex materials in Australia.