

The pursuit of operational and environmental excellence

Feature Company: Anglo Platinum

Summary: Anglo Platinum's Waterval Smelter in Rustenburg, South Africa, has recently undergone a major technological upgrade using Ausmelt technology – a first for the platinum industry. The installation of the new converters and acid plant has reduced sulphur emissions at the smelter to well below the legal limit, and consequently, set a new standard for the metals industry.

IPA member, Anglo Platinum, is the world's largest producer of platinum group metals. Anglo Platinum's Waterval Smelter, located in Rustenburg, North West Province, South Africa, provides a shining example of how the platinum group metals (PGM) industry takes a leadership position with respect to operational and environmental excellence.

The Waterval complex, originally established in 1969, has become the world's largest platinum smelter. The smelter processes concentrate from surrounding mines, as well as the furnace matte produced by three other smelters owned by Anglo Platinum.

The original complex consisted of two electric furnaces for primary smelting with Peirce Smith converters producing the product matte for refining. This original process also emitted over 200 tonnes per day of sulphur dioxide (SO₂) – a pollutant that when emitted into the environment, reacts in the atmosphere to produce acid rain. In the early 1990s, Anglo Platinum embarked on an ambitious project to upgrade its Waterval Smelter, primarily to increase the converting capacity in line with future projected production profiles, as well as to reduce site emissions of sulphur dioxide.

This led to the construction of the 1.65 billion Rand (or 150 million €) Anglo Platinum Converting (ACP) process plant. The existing Peirce-Smith converters were unable to adequately capture and contain the SO₂ gases produced during the converting process. As such, increasing production would make it difficult to meet environmental obligations in the future. As a result, Anglo Platinum needed a different solution.



The new converters and acid plant reduce sulphur emissions from over 200 tonnes per day to less than 20 tonnes per day.

After conducting an extensive technology search, and running trials of both local and overseas pilot furnaces, Anglo Platinum settled on the Ausmelt converter as its best option. The principle benefit of the Ausmelt converter is its ability to enhance gas capture and gas concentration. Concentrated gases are more easily processed by acid plants. Although the Ausmelt converter was considered proven technology, it had not been piloted in the platinum industry. Considerable engineering efforts were therefore required to achieve safe, efficient and sustainable operation.

The design solution involved replacing the existing Pierce Smith converters with a single large Ausmelt converter and a new acid plant. The first of the two converters came on line in early 2003. The second stand-by furnace was commissioned in January 2006.

Ever since its commissioning, the plant successfully keeps sulphur dioxide emissions well below the permitted 20 tonnes per day. Furnace and converter off-gases are treated through the tower and contact acid plants for production of 76% and 98.5% sulphuric acid (H_2SO_4) respectively. These are mixed to produce 98% sulphuric acid for sale to the fertiliser industry.

The upgrade of Anglo Platinum's Waterval Smelter was a first for the platinum industry and raises the bar for the global mining and metals industry. The project demonstrates the industry's commitment to investing in new technologies in the pursuit of operational and environmental excellence.



Anglo Platinum took top prize in the sustainability category at the 2006 Nedbank Green Mining Awards, which celebrates responsible mining. As part of the award, the Anglo Platinum Converting Project (ACP) was acknowledged for its innovative approach to reducing sulphur emissions to well below the legal limit and in doing so setting a new standard for the metals industry.

Source: Anglo Platinum

International Platinum Group Metals Association
Schiess-Staett-Strasse 30
80339 Munich, Germany

by telephone: (+49) (0)89 519967-70
by fax: (+49) (0)89 519967-19
by email: info@ipa-news.com