## TENOVA TAKRAF - MEDIA RELATIONS

### Tenova TAKRAF technology assists Industry meet stricter air quality regulations

As South Africa's environmental regulations move closer to global standards with national air quality regulations calling for a significant reduction in the industrial emissions of not only particulate matter, but also noxious and sulphurous fumes amongst others, there is a rapidly growing demand for both dust control and fume extraction systems, notes air environmental specialist Tenova TAKRAF Africa.

"Stringent regulations were promulgated in the government gazette of 2005 as additions to the National Environmental Management: Air Quality Act (Nemaqa), with compliance initially set for this year," says Theo Nkisimane, Tenova TAKRAF Africa Project Manager.

The regulations are aimed at imposing a carbon emission tax and enforcing gas-emission limitations that are on par with global standards.

"While, at the request of some major industrial plants, government is considering moving the deadline out for compliance, other companies, such as Impala Platinum Refineries (IPR), a division of Impala Platinum Group – Limited (Implats), are well advanced in projects to ensure their plants comply with the new regulations timeously," says Nkisimane.

"The Boiler Emission Abatement (BEA) Plant Project that we are currently working on for Impala Platinum Limited – Refineries is believed to be the first of its kind in Africa and, for us, is a

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showcase of the advanced technological solutions we can provide to reduce dust and fume emissions to well within legal limits."

The regulations, particularlly for precious and base metal production and refining, require particulate matter (PM) to be reduced to less than 50 mg/$Nm^3$, NOx (nitriogen oxide and nitrogen dioxide) gases to less than 300 mg/$Nm^3$ and SOx (sulphur dioxide) gases to less than 400 mg/$Nm^3$.

"However," says Nkisimane, "the Impala Platinum Refineries' BEA plant will achieve much lower dust and fume emissions, reducing PM from the boiler flue gas to less than 25 mg/$Nm^3$, SOx to less than 200 mg/$Nm^3$, and NOx to less than 150 mg/$Nm^3$."

**Dust and fume extraction technology**

Tenova TAKRAF Africa's technology package utilises world leading dust and fume extraction systems

NOx gases are removed using the ELEX Selective Catalytic Reaction (SCR) DeNOx technology for which Tenova TAKRAF Africa is the licenced distributor for all industries, apart from the cement sector, across Africa. Ammonia required for the reaction is determined by the NOx-level, which is continuously measured in the gas, and it is then injected in the gas stream upfront of the reactor. The ammonia-infused catalysts react with the NOx gases to produce a vapour comprising non-harmful nitrogen and $H_2O$. Following this, the Simatek Dry Flue Gas Cleaning System (DFGCS) is used for absorption of $SO_2$ and acid gases as well as collection of particulate matter to fulfil dust emission requirements. This process includes injection of Calcium hydroxide (lime) to the gas stream and the use of Fabric Filter as a Reactor to ensure efficient $SO_2$ absorption and reduction of particulate emissions.

Tenova TAKRAF is the exclusive distributor in Africa for the Simatek Low Pressure Bag Filter technology, which enables economical collection of fumes and dust at high filtration rates. The filter modules used for this project specifically are based on the unique SimPulse 3C filter concept, which features a pulse jet cleaning system for uniform and effective cleaning of all filter bags one by one. This individual bag cleaning principle results in very long cleaning intervals which together with the low pressure – high energy pulse, provides a very gentle cleaning and extended bag life. The construction of the Simatek filters with cylindrical casings ensures reduced plant footprint and that there are no “dead corners” and the risk of low temperature pockets with increased corrosion risk is also substantially reduced.

**The BEA Plant Project**

The BEA plant, being designed and constructed for Implala Platinum Refineries in Springs, will be an integrated plant with the capability to efficiently and effectively remove pollutants, such as fly ash particulate, $SO_2$ and NOx, from the boiler flue gas. In addition, it will improve existing boiler heat recovery and boiler feed water systems, as well as produce only a minimal amount of waste residual, reducing the environmental impacts from waste handling or disposal.

The major components of the BEA plant are the ELEX catalytic gas cleaning system for removal of NOx gases; three economisers for boiler heat recovery and a new boiler feed water system; the Simatek dry flue gas cleaning system with four Simatek pulse jet bagfilter modules, a lime reagent storage and dosing system for $SO_2$ and PM removal; and a dry particulate waste pneumatic transfer system. One of the challenges of the project is the need to limit plant downtime, as the plant operates 24 hours per day throughout the year with a planned shutdown lasting only 60 hours, once a year. For this, strategic by-passes and equipment redundancy are provided for,

where applicable, to ensure that the new BEA plant does not lead to any stoppages to the existing steam plant.

Tenova TAKRAF, a division of Tenova Mining and Minerals, is a key supplier of equipment and systems for open pit mining & underground solutions and bulk handling, having provided hundreds of complete systems, as well as individual machines to clients all over the world in all climatic conditions. Globally sourced air pollution control, specialised handling equipment, and technology for the cement and fly ash industries ensure selection of optimal processing options.

Tenova Mining & Minerals, a subsidiary of the Tenova Group, is a total integrated solutions provider to the global mining, bulk materials handling and minerals beneficiation and processing sectors, offering innovative technological solutions and full process and commodity knowledge across the mining industry value chain.

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