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SNC-LAVALIN COMPLETES PHASE 4 OF KCC KAMOTO PROJECT

SNC-Lavalin has completed Phase 4 of Katanga Mining's Kamoto Copper Company (KCC) expansion project in the Democratic Republic of Congo (DRC). Together with the successful completion of Phase 3 of this project, this is the largest project SNC-Lavalin's Johannesburg office has undertaken to date.

KCC is a joint venture between Glencore's Katanga Mining (75%) and the state-owned Gécamines (25%). Gécamines first began operations in the Kamoto underground mine in 1969 and by the 1980s the mine was producing three million tonnes of ore annually. Before being closed in October 1990, it had produced 59.3 million tonnes of ore with a grade of 4.21% copper and 0.37% cobalt — among the highest grades in the world.

John Dixon, project manager, SNC-Lavalin, explains that the existing plant had been built and commissioned in the early 1970s, and although it was well designed and constructed, the plant had become outdated and was in poor condition. Based on findings in an earlier feasibility study, SNC-Lavalin was brought on board in 2010 to supply an integrated engineering solution to complete restoration of the plant to full operational capacity as part of Phase 3 of the project. The company's scope was to upgrade the plant to existing nameplate capacity and this included the rehabilitation of existing plant and equipment.

This work ultimately resulted in an extension of SNC-Lavalin's contract to undertake Phase 4 of the project, which involved upgrading the plant to produce 270 000 tpa of copper. The award for the front-end engineering and early works was received in August 2010.

SNC-Lavalin's integrated engineering solution was based on a METSIM® model that integrates and optimises mass water and energy balances across the entire plant, minimising the consumption of reagents, water and power, and ensuring effective interfaces between the different elements of the plant.

"Prior to being awarded the contract to conduct front-end engineering, we carried out a scoping study in which we examined 12 different options to increase production at the plant,"

Dixon says. “Of these, we recommended a low-cost, fast-track option and in April 2011 we received the go-ahead to proceed with full implementation. The salient feature of this option was that it was engineered to use much of the existing plant, thereby achieving significant cost savings.

“A new element was also introduced – a state-of-the-art solvent extraction (SX) plant that today is one of the largest plants of its kind in the southern hemisphere. Our scope of work was scheduled for completion by the end of September 2013 and we met this requirement by taking a very flexible approach, since it was important to accommodate changes within the scope of work and services as they occurred,” Dixon adds.

A completely new flotation section was constructed within the confines of the existing building presenting major challenges in respect of geotechnical conditions and space constraints. The new equipment has proved so successful that KCC are considering replacing all flotation circuits with similar equipment.

SNC-Lavalin undertook the design and procurement of the SX plant and provided KCC’s construction crew with technical support. The massive SX plant, with a footprint of 800 metres by 600 metres, utilises kerosene jet fuel to extract the copper. The plant is fully fabricated from stainless steel to resist the aggressive and highly acidic chemicals in the circuit and because of the kerosene all equipment is explosion proof.

The SX plant’s 15 tanks, each 27 metres by 18 metres in size, were manufactured in Johannesburg and assembled on site in phases, one train at a time. Each train has a nominal capacity equivalent to the production of 100 000 tpa of copper.

“The conversion of the existing electro-refinery to an electro-winning plant proved to be a highly cost effective initiative, necessitating the rehabilitation of 720 cells in five individual banks and the installation of completely new electrical and piping reticulation within the plant.”

Dixon adds that this was a high-value project and the high grade of the copper led to the decision to proceed directly with implementation while detailed engineering progressed. The

combined engineering team, comprising KCC and SNC-Lavalin personnel, took this decision on the basis of predetermined criteria.

“We were able to interface effectively between the owners’ project team and the owners’ operations teams,” he concludes. “The design process had gone well and we ensured that there were people on the ground with the necessary expertise and skill in terms of implementing projects within an operating environment.

“Our achievement is that we’ve brought a dated and very large plant up to speed and to the client’s satisfaction.”

About SNC-Lavalin

SNC-Lavalin is one of the leading engineering and construction groups in the world and a major player in the ownership of infrastructure, and in the provision of operations and maintenance services. Founded in 1911, SNC-Lavalin has offices across Canada and in over 40 other countries around the world, and is currently working in some 100 countries. www.snclavalin.com.

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KAMOTO PROJECT PIC 02 : The CM3/CM4 flotation cells at Kamoto.

KAMOTO PROJECT PIC 03 : Harvesting of the copper cathodes at Kamoto.

KAMOTO PROJECT PIC 04 : Cu SX trains nearing completion at Kamoto.

KAMOTO PROJECT PIC 05 : Electro-winning and cathode stripping machine at Kamoto.

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