

Minimized labour, maximized yield with Memosens COS81D

Dissolved oxygen measurement in cyanide leaching



FMR Investments is an investment organisation with interests predominantly in the mining and mining related industries. One of its various mining and milling projects is Greenfield's Mill in Western Australia. The mill has provided a first class toll milling facility to the gold industry for over twenty years. The plant is very unique in so much that with three Ball Mills; the circuit can be optimized to suit a particular client's needs to maximize gold recovery. In the current configuration the plant is able to treat up to one million tons per annum after going through a number of upgrades during the last two years.



John Tagle, Electrical Supervisor, Greenfield's Mill



The Greenfield's Mill in Western Australia

To get the maximum product yield out of the leaching process in a gold mine, the right oxygen level is decisive. In the past, the oxygen sensors in Greenfield's Mill did not last more than a few months, due to the harsh conditions of the process. With Memosens COS81D, the mill could not only save time and replacement parts, but also improve the control of the process thanks to the more reliable oxygen measurement.

Challenge In Greenfield's Mill, DO sensors are used in the first two leach tanks in the gold processing operation. The slurry in the tanks made up of abrasive gold ore at 47% solids with a particle size of 106µm. The slurry has a high pH, ranging from 8-11 with an average of 9.4, is hyper saline and contains high concentrations of cyanide. The probes are used to regulate the oxygen levels in the tanks to a set point of 15ppm, with peaks of up to 40ppm.

The main problem with the previous DO sensors was that they only lasted 4-6 months. With most gold mines, safety is the number one priority, and one of the highest potential hazards mines will have onsite is the presence of cyanide. Therefore the minimization of any work conducted on the tanks where there may be cyanide present is very important.

Our solution We suggested the use of Memosens COS81D together with a Liquiline CM44 transmitter and a pH sensor CPS11D. The DO sensors lasted at least 12 months, and have only been calibrated a couple of times. There have been no problems with erosion or corrosion with the probes. However, we recommend to clean them regularly (at least once every few weeks) to remove any build up. This should be done carefully to avoid scratching the probe while cleaning. Memosens COS81D dissolved oxygen sensors deliver precise, long-term stable measurements. Their permanent

self-monitoring ensures the most reliable measured values to help meet desired process specifications and optimize product yield.

The measuring point consisted of the following components:

- DO sensor: Memosens COS81D-AAA2UB11
- Transmitter: Liquiline CM442-AAM2BDF060A+AA
- pH sensor: CPS11D-7BT21
- Holder: CPA111-60D
- Cable: CYK10-A881

Result Time is saved as the probes do not need to be replaced or maintained regularly (over 4 times a year in a reduction in exposure time). This also meant technicians needed to spend less time on the leach tanks, where there is a high risk of HCN being present. The minimization of labour and parts replacement in the field is also valuable in terms of potential costs.

There is also savings in oxygen as operators can continuously, reliably measure oxygen and adjust flowrates accordingly. Oxygen costs approx. \$2 per cubic meter, and a reduction in usage of oxygen would save in reagent costs. Savings are also made as probes need to be replaced less often. The ease of connectivity between the sensor and the PLC through Ethernet IP has also improved how the data from the sensors is interpreted.



The slurry in the leaching process contains a high level of cyanide. Therefore the reduction of any work conducted on the tanks is desirable.



The DO sensors Memosens COS81D lasted at least 12 months.



A measuring point consists of a DO sensor Memosens COS81D, a pH sensor CPS11D and a Liquiline CM44 transmitter.