FULLY AUTOMATED MONITORING OF DEFORMATIONS AT LARGE OPEN PIT MINES – PROBLEMS AND SOLUTIONS

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Abstract: Over the past few years, CCGE and ACA developed a hybrid 'ALERT' system for a fully automated and continuous monitoring of structural and ground deformations. The system utilizes robotic total stations (RTS), which may be linked with various other sensors (GPS, pseudolites, geotechnical instrumentation, meteorological instrumentation, etc.). The system has been employed at several earth dams and large open pit mines in Canada, USA, and Chile. The experience gained through continuous monitoring has given an opportunity to re-examine effects of the instrumental accuracy, atmospheric refraction, and tropospheric delay on the achievable accuracy of displacement monitoring in the harsh environment of large open pit mines. Some mitigatory measures have been developed to minimize the effects and increase the reliability of the monitoring results.