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COMPARISON OF SATELLITE SURVEYING TO TRADITIONAL SURVEYING METHODS FOR THE RESOURCES INDUSTRY

Abstract

Modern survey methods involve detailed survey, by means of 'total station' instruments which provide the local 3-space co-ordinates for surveyed points, to a high level of accuracy. The instruments are operated by surveyors who process the raw results to create survey location maps for the subject of the survey. Such surveys are conducted for a location or region and translated to the earth global co-ordinate system by reference to global positioning system (GPS) positioning. Due to this referencing the survey is only as accurate as the GPS reference system. Satellite survey's utilise satellite imagery which have been processed using commercial geographic information system software. 3-space co-ordinate maps are generated, with an accuracy determined by the datum position accuracy and optical resolution of the satellite platform. This paper presents a case study, which compares topographic surveying, undertaken by traditional survey methods, with satellite surveying. The purpose of this study is to assess the viability of satellite remote sensing for surveying in the resources industry. The case study involves a topographic survey of a dune field for a prospective mining project area in Pakistan. This site has been surveyed using modern surveying techniques and the results are compared to a satellite survey performed on the same area.

Analysis of the results from traditional survey and from the satellite survey involved a comparison of the derived spatial co-ordinates from each method. A statistical comparison was undertaken to determine the confidence intervals for the derived data x,y,z co-ordinates. In addition, comparisons have been made of costs and turnaround time for each method.

The results of this application of remote sensing is of particular interest for survey in areas with remote and extreme environments, weather extremes, political unrest, poor travel links, which are commonly associated with mining projects. Such areas frequently suffer language barriers, poor onsite technical support and resources. The study comparison has been undertaken as a result of collaboration between SRK Consulting, Kingston University and ISP Aerospace.