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Optimisation of the shaft call factor through improving the advance strike gully geometry and its conditions at doornkop shaft

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ABSTRACT

Doornkop Shaft had a regression in the Shaft Call Factor (SCF) from the year 2012 to 2017 of about 26%. This regression continued to a SCF of 59% in February 2017, against the plan of 81% of the year 2017 budget. The SCF is the ratio, expressed as a percentage, which the specific product accounted for on the belt as dry tonnage is compared to the corresponding product called for by a survey measurement from underground sources. These underground sources include amongst others a blasted stope, which requires an Advanced Strike Gully (ASG), orepass, haulage and skip to transport the blasted ore from the stope to the belt. This research study seeks to optimise the SCF through the improvement of ASG geometry and conditions. This improvement is done through the prevention of any loss of ore likely to occur during the cleaning process due to the geometry and conditions of the ASG.

The research study was carried out using quantitative methods in data collection through underground visits, grade reports, Radio Frequency Identification (RFID) tags report (Appendix B) and sampling sheets. Thereafter analysis was conducted. The correlogram was conducted to analyse the correlation between the SCF to the gully depth, width and length. The research study findings indicate that the geometry and condition of the ASG encourages the loss of ore during the cleaning process. This loss occurs mainly through accumulations, which negatively impact the SCF on a month-to-month basis. The study further, found that a 14 % gain to the SCF can be achieved if these accumulations are cleaned to surface. In addition, it is recommended that ASG's geometry must be

developed to the required mine standard, as that will ensure ore capacity and easy flow of ore to the ore pass.