Operational limitations in deteriorated shaft

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Mineshafts in deep level mining form the life line of the mine. They are used to transport material to the orebody and hoist ore to surface. The men and material are hoisted in the shaft by means of a conveyance travelling in its shaft guidance system. The guidance system is either a fixed shaft steelwork or rope guides. This paper will address only the fixed shaft steelwork guidance system. The conveyance is located in guides that run continuously for the depth of the shaft. These guides are supported horizontally by means of a grid of beams referred to as buntons. The buntons are secured to the side walls, either in the shaft lining inside a pocket or chaired seating. The grid of beams is typically spaced at 6m spacing. Thus, this guidance system forms the lifeline of the mine. However, the structural elements tend to deteriorate with time due to corrosion, mechanical damage and deformation from rock movements. In addition, the shaft's operational life tends to be extended past its design life. Thus, it is important that the structural integrity of the shaft steelwork is maintained for safe and reliable use.

This paper reports on a sensitivity analysis conducted on a shaft steelwork configuration for deterioration of steelwork. It will recommend a design procedure to establish the functionality of the steelwork.

Structures for Mining and Materials Handling Conference, November 2009 ~ Sun City, South Africa