The Application of a Bespoke Ventilation on Demand (VoD) System at Carrapateena Sub Level Cave

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ABSTRACT

Carrapateena is an underground sub level cave operation which began development in 2017 and has an estimated mine life of 20 years. With a rare opportunity in starting with a blank canvas and having a long mine life, an effort has been made to explore innovative and leading-edge technologies. The Ventilation on Demand (VoD) system was designed with the objective to optimise power consumption and ventilation delivery through the primary and secondary ventilation systems. Primary fans controlled by variable speed drives (VSD's) and dual-winding secondary fans with multiple setpoints control the delivery of overall quantity. Automated butterfly dampeners control the regulation of air to individual production crosscuts, and automated louvres control the exhaust quantities from the mining levels. Ultra-sonic flow sensors are installed to measure air quantity and environmental stations are installed to measure air quality. Both are designed to play a key role in control and calibration of the system. It was quickly identified that no one vendor could provide a holistic solution to meet the design requirements. A strategy was derived to use multiple vendors harnessing the specific strengths of each. A control system has been developed to allow the Site Operations Centre to oversee and control real-time delivery of ventilation as required by operations. The first full level installation of the VoD system is due to be completed in July 2020. The results of which are contained in this paper.