

# **AUTOMATED DELIVERY SYSTEM STAGE 1: AUTOMATED CHARGING OF UNDERGROUND PRODUCTION UP-HOLES**

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## **ABSTRACT**

Automation helps the mining industry achieve advances in safety and productivity and lowers operating costs. The mining process is immense and there are many innovations that can contribute to this pursuit. This paper focuses on one advancement that would offer significant benefit to the mining industry: the automated charging of underground production up-holes. In addition to the issues mentioned above, it would address aspects of the human resources issues faced by the industry. With the end-goal of producing a fully automated emulsion delivery system where the operator merely starts the process with the click of a button and the machine loads the entire hole pattern by itself, Orica has undertaken a multi-stage approach with its Automated Delivery System (ADS).

The ADS first stage objectives are to allow the operator to control the entire loading process from the safe and comfortable confines of the cab of the mobile charging unit. ADS makes use of: a laser scanner to scan and map the tunnel surface, a pumping system that automatically fills the hole with emulsion, a robotic arm that allows the automated positioning of the hose into the hole and provides a mechanism for primer assembly without human intervention, and a human machine interface that allows the operator to control and monitor the various operations and subsystems. This paper describes the ADS Stage 1 development and discusses some of the challenges associated with it.