Improving Overall System Reliability

Objective

Reduce the likelihood of failures in BEVs, batteries and support equipment through a holistic set of design choices, equipment monitoring and risk management activities.

Justification

When assessing the risks of failures in batteries and BEV support equipment, New Gold took inspiration from how standard electrical substations are managed underground. The team decided to focus on interventions to reduce the likelihood of failures occurring, while installing backup safety systems to manage risks that might occur.

Implementation

Charging bays were located in the fresh air portion of the ventilation circuit to reduce the exposure to risks caused by operating equipment in moist, dirty and hot air. The ergonomics of battery swapping activities and the charging bay configuration were also addressed to make moving batteries and cable handling more reliable.

On the **charging equipment**, the design of the coolant line connections was modified by the New Afton team to make cleaning the interface simple and quick, and to avoid grit and dirt getting into the coolant systems. The new quick-release coupler also improved the ergonomics for operators changing batteries.

A robust **safety system** was implemented with a fire risk zone located on a nearby exhaust route (150 m from the charging bay). Thermal cameras were added to the safe zone for monitoring damaged batteries/BEVs. Regularly reviewing fire risk plans in a developing mine is a continuous activity.

Equipment monitoring via telemetry systems is being introduced to monitor the charging status and any alerts from the batteries, chargers and cooling cubes in real-time.

Progress to Date

The reduction in dust and dirty air has lowered the charger maintenance workload and the regular preventative maintenance requirements for the cooling equipment, e.g. through less clogging of filters.

This results in chargers that are generally cooler, and cooling equipment that operates more effectively, overall allowing for faster battery charging rates.

The safety system and battery design were put to the test when a battery fell off a boom truck. The battery was monitored closely in the safe zone, then disassembled and tested to ensure it was safe to reenter service.

"Our attitude has always been we're better off to have [batteries and charging equipment] in fresh air. And to have a robust safety system around monitoring, maintenance and a plan to move them when we need to"

Superintendent for Production and Construction

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