COMMAND FOR UNDERGROUND

IMPROVE SAFETY AND UTILIZATION WITH SEMI-AUTONOMOUS OPERATION.

Cat® MineStar Command for underground enables remote operation of load-haul-dump machines. The system improves safety by removing operators from hazardous environments. It also delivers machine utilization increases over line-of-sight mucking operations by reducing the downtime required for shift changes, blast times, and any other conditions that can remove operators from the face.

Options range from simple line-of-sight to full autonomy (R1700). This building block approach allows miners to capture value at their most economic entry point while allowing scalability as technology maturity grows.

BENEFITS

» Provides ability to relocate operators to a safe, comfortable location underground or on the surface.

» Eliminates exposure to noise, dust, seismic activity and other underground hazards and reduces the need for air delivery and cooling.

» Allows access to deeper ore bodies.

» Improves operator comfort, retention and recruitment and helps address the skills crisis.

» Allows monitoring of operations through video, with real-time location and status data.

» Prevents collision damage caused by LHD machines contacting tunnel walls.

» Provides integration of automation features like Auto-Load.

» Enables control of multiple machines from a single Remote Operator Station.

» Allows miners to build to their desired level of technology with our scalable, interoperable solutions.

» Optimizes shift changes by enabling hot-seat operator exchanges.

» Allows continuation of operation through seismic events.

» Allows a quick return to work after a blast to get production back on track.

» Greatly reduces fatigue (teleremote and above), allowing operators to improve their quality of life.

» Provides ability to monitor machine health through user interface to ensure machine is not at risk.

» Provides ability to configure zones to regulate machine speed and establish exclusion areas.

» Integrates with certain validated third-party radio networks.

» Leverages ruggedized onboard components from other proven technology programs.

» Allows customers to upgrade existing assets through retrofits.
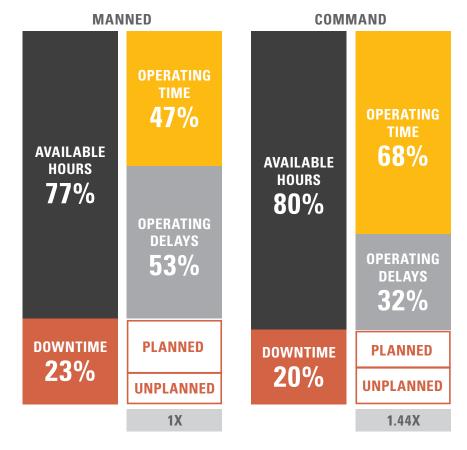
DIFFERENTIATORS

» **Integration.** Caterpillar differentiation continues with deep integration with the base machine as well as site integration with the broader MineStar for underground solutions.

» **Interoperability.** While putting Cat technology on Cat equipment is the ideal scenario, the building block for interoperability is now available for Command for underground.

» **Support.** Service and support provided by the global Cat dealer network are a significant differentiator.
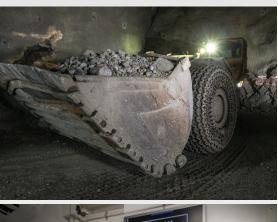
SUCCESS STORIES

Although safety is at the heart of the Command for underground product, miners experience machine utilization increases of up to 44 percent over line-of-sight mucking operations—resulting in a measurable impact on their bottom line.

INCREASED UTILIZATION OF LHDS BOOSTS PRODUCTIVITY
Payback can be realized in less than a year

MANNED

AVAILABLE HOURS 77%

OPERATING TIME 47%

OPERATING DELAYS 53%

DOWNTIME 23%

PLANNED

UNPLANNED

1X

COMMAND

AVAILABLE HOURS 80%

OPERATING TIME 68%

OPERATING DELAYS 32%

DOWNTIME 20%

PLANNED

UNPLANNED

1.44X

CAT®