CASE STUDY

SURFACE TELEREMOTE AND GUIDANCE SOLUTION AT PERILYA

The Teleremote Solution assisted productivity and reduced the health and safety risks to operators at the mine

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REQUIREMENT

Increased productivity and a means to minimize risk were the primary objectives for Australian base metals mining and exploration company, Perilya.

Perilya recognised the benefits of innovation and technology in achieving the best outcomes for their Broken Hill operation.

In order to reach their targets of increased productivity together with a significant increase in safety, RCT was enlisted to develop and implement a series of remote control solutions. This included the implementation of RCT's Line-of-Sight remote systems as an introductory solution with the ability to upgrade as required. RCT's Teleremote and then Guidance solutions were the natural progression from the Line-of-Sight technology and Perilya took up the opportunity in early 2011 as they saw the benefits of further increases in safety and productivity.

RCT SOLUTION

Perilya was able to benefit from increased production on the implementation of RCT's ControlMaster® Guidance Solution. The Solution allows for the steering, braking and throttle of the machine of the loader to be automatically controlled with required intersection inputs via the existing Teleremote joystick. The Solution also allows for the selection of higher gears where required, maintaining an optimal tramming path to improve the overall speed of tramming cycles, resulting in more tonnes moved.

The ControlMaster® Surface Control Underground Teleremote System was then installed to further increase productivity and reduce the health and safety risks to operators at the mine. Here underground equipment is controlled from a specifically designed Control Station situated on the surface. Apart from the immediate health and safety benefits for the operators, considerable time was saved during shift change over as no underground travel time was required during shift change overs.

"The key strength of the tele chair (Surface Control Unit) is that it enables hot seating, between day and night shift operators, within a matter of minutes compared to the use of conventional underground tele cars" said Michael Liyanage, Mining Engineer at Perilya's Broken Hill operation. "It can take operators up to 1.5 hours to catch the cage down, after blasting fumes have cleared, travel to the crib room, travel to the job, do a pre-start and 3TC."

Both the RCT Surface Control Underground Teleremote System and Guidance Solutions implemented at Perilya allowed the mine to achieve greater machine serviceability of their underground equipment. Damage to the equipment was minimized through the laser technology available in the Guidance Solution which provides real time assessments of current mine conditions and maintains a safe distance from the drive walls. With reduced downtime and less requirement for repairs, Perilya was able to get more use out of their equipment.

Perilya now has the opportunity to install additional Surface Teleremote Control Stations at a lower rate as the engineering and development costs were absorbed in the initial unit outlay.

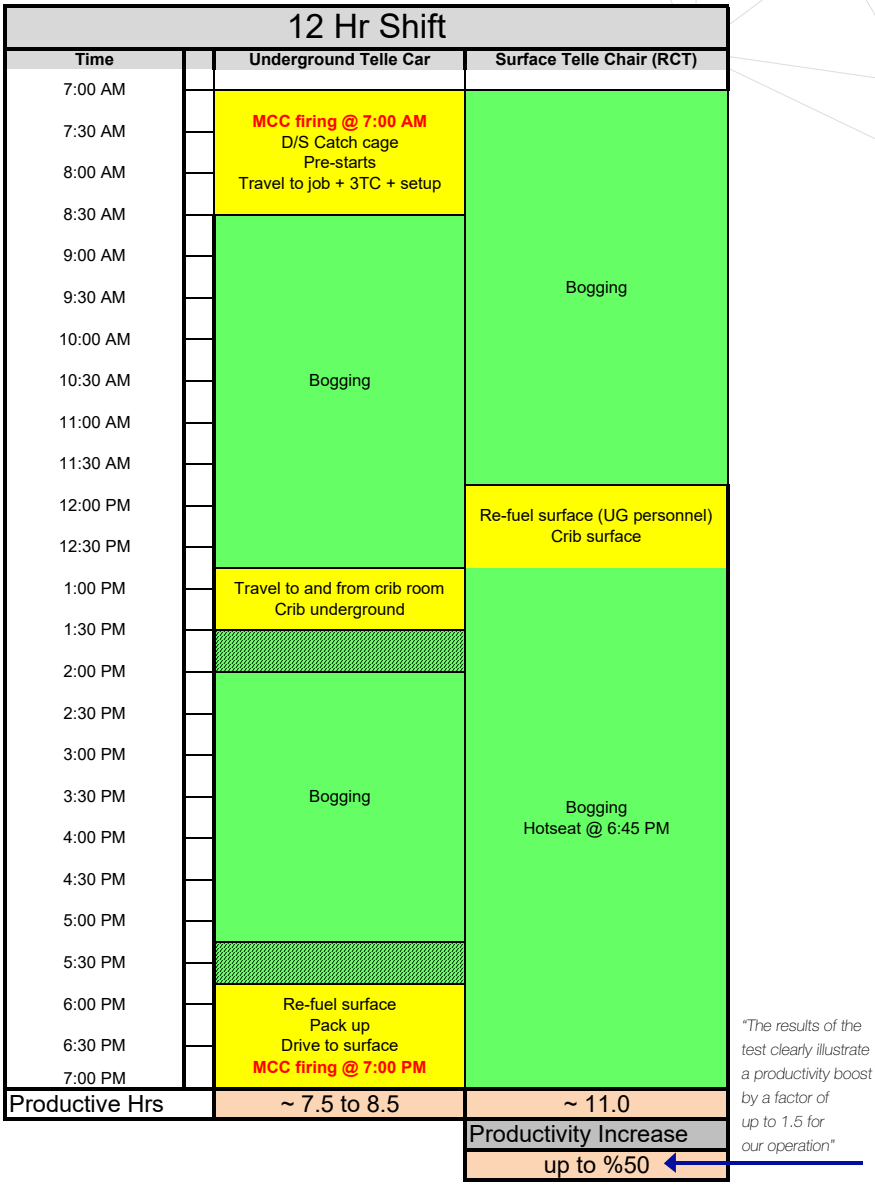
OUTCOMES

- Increase in productivity with increased operational hours as reported by Perilya
  - Using the conventional Teleremote/Guidance Solution
    - total productive hours = 7.5hrs to 8.5hrs
  - With RCT's Guidance Solution operated from the Surface Control Unit
    - total productive hours = up to 11hrs.
  - With RCT's Guidance Solution, increase in mechanical utilization was between 25% - 50%

Tramming speeds were increased significantly with the Guidance Solution allowing the loader to navigate its own way along the path, resulting in more tonnes moved

- The loader was able to travel at significantly faster speeds along the tramway due to the laser assisted navigation resulting in faster tramming cycles and more tonnes moved.

- Time savings
  - Up to 2 hours due to the rapid changeover of equipment operators during the shift transitions



"The results of the test clearly illustrate a productivity boost by a factor of up to 1.5 for our operation"

  - Approx. 1.5hrs for breaks – no need for the operator to drive to crib area
  - Between 1-1.5 hours per blast with no need for the operator to move to a safe location and for the dust to clear
  - Avoid downtime for servicing and refuelling, this is conducted one every 24 hours and scheduled with the operator's lunch or smoke breaks.

- Health benefits - reduced exposure to DPM (Diesel Particulate Matter), dust and noise
- Safety benefits - operator located on the surface with reduced vehicle interaction
- Reduction of the number of light vehicles underground, with a reduced requirement for surface controllers to go down to the machine for pre-starts, and then operating the machine/s on Tele Guidance. Light vehicles cost money to run and maintain, they are a very large budget item on any mine (up to $80k to purchase alone)
- Less opportunity for error with reduced human intervention

ControlMaster's Guidance Solution increases the general tramming speed on underground machinery

Sub level Teremote control cabinet

- Four camera output used for the operator to view the "Live" Guidance image to gain machine location/perspective to walls in high dust Teleremote operation. Guidance video output (what the Guidance Solution sees by means of the laser) through the fourth camera input of the Teleremote transmitters giving the operator more of an understanding of what the Guidance Solution does and how it works. The Guidance view also provides the operator with accurate information on how far the machine is from the drive wall when using Teleremote to load and unload the bucket.

In order to compare the perceived benefits of RCT's Surface Control Underground Teleremote Solution against the Teleremote/Guidance solution currently used at Perilya's Broken Hill operation, Perilya conducted a productivity study on both setups. To achieve a fair comparison and to provide realistic results, these were conducted on the same drive over a distance of 150 metres with varying experienced operators.

The results showed significant efficiencies gained with RCT's Surface Control Underground Teleremote Solution with between 880 and 1300 tonnes moved over a 12 hour shift (80 - 121 buckets), while the use of the conventional Teleremote/Guidance solution resulted in 550 – 880 tonnes moved (50 – 80 buckets).

"The results we have seen at Perilya provide further compelling evidence of the distinct productivity benefits of our Guidance Solution," commented Bob Muirhead, MD at RCT. "This clearly illustrates how to minimize the cost of using an LHD – lowering the costs of moving material by moving more tonnes, more consistently, over a longer period of time and with no damage to machinery."

CLIENT COMMENTS

"The results of the test clearly illustrate a productivity boost by a factor of up to 1.5 for our operation," said Mr Liyanage. "From a business perspective, Perilya is achieving significant benefit for its investment in RCT's Guidance Solution to maximize productivity and utilization."

"Perilya is satisfied with RCT's service and plans to investigate further opportunities to automate its operation."

RCT COMMENTS

"These overall production gains have been achieved by the customer through the implementation of policy, procedural improvements and processes to optimally drive the high use of RCT Surface Control Guidance Solution. I was informed that they run the machine on Surface Control – Guidance/ Teleremote for approximately 22 out of 24 hours!" said Adam Gough, Account Manager – NSW Hard Rock.

RCT'S CONTROLMASTER SURFACE CONTROL GUIDANCE SOLUTION

The ControlMaster® Guidance Solution has been designed to increase operational efficiency and productivity by reducing impact damage to the machine while increasing the general tramming speed.

The ControlMaster® Surface Control Underground Teleremote Solution allows the operator to control the underground machine while located in a specially designed room at the surface of the mine. The ControlMaster® Guidance Solution reduces the risk of collision with the walls and major obstacles while keeping the loader on the optimal tramming path.

While the ControlMaster® Guidance Solution currently provides significant efficiencies for large and small mining operations worldwide, RCT is committed to constantly innovate through its continuous improvement programme. The recently released version 2.3 has extended the system's capability with the inclusion of articulation calibration and control for more accurate steering, and improved collision prediction and cuddy handling, to further improve the operation of the machine under Guidance control.

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