



Productivity gains with Robofuel: Automated Refuelling

Automated Refuelling involves the application of a robotic arm to refuel conventional mining equipment to both increase productive hours and efficiency of trucks and reduce cash costs on site.

Typically, refuel facilities are manned by at least one person at all times and trucks can spend up to one hour per day travelling to refuel in isolated areas away from the pit.

As there is no manning required for an automated solution, refuelling stations are able to be placed "on the circuit" or even "in-pit" so fleet productivity can be significantly enhanced.

Scott Automation & Robotics Robofuel system uses a state-of-the-art vision sensing and detection system which allows the robot to locate the position and orientation of the truck's fuel tank.

This information is used to couple the fuel nozzle with the tank. Fuel spillages are minimised through controlled coupling, pumping and monitoring

mitigating the risk of environmental contamination.

BENEFITS:

- **COST**
No requirement for operators on site to man fuel stations and re-fuel mobile equipment. Supervision and confirm activities may be undertaken at a remote operations centre.
- **PRODUCTIVITY**
Reduced time, distance and specific fuel consumption to refuel as the robofuel system can be installed on-circuit. This can enable trucks to complete up to an additional cycle per shift depending on locations of existing refuelling infrastructure.

Based on a 220 tonne payload and a 50 truck fleet, this equates to up to approximately 11,000 tonne per day or 4mt of Productive Movement per year.

- **SAFETY**

Eliminates exposure to flammable liquid and repetitive strain injuries by removing this manual process from site.

Reduces interactions between personnel and vehicles, reducing the risks of tyre failure exposure, collision with vehicle, falling objects.

- **FLEXIBILITY**

Robofuel may also be utilised for mobile applications including the replenishment of drills and excavators, and in other sectors including road, rail, marine and aviation.





BENEFITS OF AUTOMATED ROBOTICS REFUELLING

- Ability to refuel without the use of a local operator
- Increased operator safety
- No diversion of the trucks from the circuit
- Increased availability of mine site trucks
- Remote refuelling skids can be relocated to optimal positions as the mine workings develop
- Minimised spillages & environmental contamination

CHALLENGES WITH THE CURRENT PROCESS

- Fuel operators working around the truck's wheel base
- Fuel farms being located off circuit outside the mine site
- The safety of the refuel operator
- Spillages of fuel
- Lost production from driving to an off circuit fuel station
- Manual replenishment of autonomous vehicle fleets.



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