

Hydraulic Valve Opening Tool

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The Problem

The bauxite mining process involves washing the product before it is loaded onto ships for transport. At the end of the washing process small material and waste water is transported to the tailings storage facilities through large pipework systems. These pipes have large spigot valves that regulate the flow into the tailings storage facilities. The Civil Services Water team is responsible for maintaining both tailings storage facilities, therefore they are required to open and close these valves on a daily basis.

Previously the maintainers were opening these valves manually. This method came with several hazards;

- If valves are too tight it can take 5-10 minutes to open each valve. This causes excessive manual handling, muscular fatigue and potential strains of the back and upper body.
- Potential for slips and falls due to maintainer working on a slippery uneven bauxite surface.
- Awkward postures as the maintainer is required to bend over and work at approximately knee level
- Maintainer is standing in the 'line of fire', if tool was to slip and come free
- Potential for pinch points



Figure 1 Manual method previously used to open and close valves

The Solution

A mechanical tradesman identified an opportunity to change the process in which valves were being opened and closed by developing a hydraulic tool. The tool is powered by petrol driven hydraulic pump fitted to the back of a utility vehicle. The tool is driven by a hydraulic motor which turns the shaft; and the lugs engage with the valve handle. The pressure of the pump is set to regulate the power of the motor to enable safe operation of the hydraulic valve tool.

The benefits of using this innovation include:

- Eliminates risks of musculoskeletal strains of the back and upper body.
- Eliminates potential impact injuries caused by the maintainer being positioned in the line of fire.
- Reduction in time
- The cost of the innovation is minimal.
- Allows the operator to stand in a correct position addressing posture and slips, trips and falls.



Figure 2 Hydraulic valve opener tool