

## **Innovation Title: Cylinder Cradle**

**Company: Copper Refineries Pty Ltd (A Glencore Company)**



### **Issue**

Design of the walking beam did not consider removal or change out of walking beam cylinders. Replacing defective cylinders required the removal of the main structure of the beam to take out the pin or unscrew the cylinder from its clevis.

Re-engineering of the structure was not viable, but unscrewing the hydraulic cylinder rod from its clevis was a high risk task involving multiple hazards associated with heavy weights (excess 350kg per cylinder), cramped work environments, suspended loads, surface friction (cylinder turning against slings and or harnesses) and manual handling risks.

In addition to the safety risks, the job was heavily resource intensive (60 man hour commitment).

### **Solution**

The solution was to design and fabricate a cradle utilising rollers on a bed of frictionless bearings that would support the cylinder, whilst enabling it to be unscrewed from its rod clevis. The cradle takes the full weight of the load, and the slings and harnesses are now used for secondary suspension control only. With the issue of friction removed, less momentum, personnel and manual handling is required to unscrew the cylinder from the clevis.

The cylinder cradle has been successful in:

- Preserving the structural integrity of the walking beam by eliminating the need to re-engineer the main structure
- Eliminating the use of slings and harnesses as a primary method to control a suspended load
- Eliminating friction risks associated with turning the cylinder in slings
- Significantly reducing exposure to manual handling risks
- Reducing labour commitment and time required to complete the task
- Being portable and adjustable to suit not only the various diameters but the random heights and weights of all site walking beam cylinders
- Being height adjustable to allow for uneven floor surfaces

### **Outcome**

From a small financial outlay (\$1,000 including certification costs) our company has achieved numerous benefits including quantifiable time savings of 52 man hours per change out and reduced risk to production, to the immeasurable advantages of improved safety and job satisfaction for our maintenance crews.