

## Longwall 1500 Structure Cassette

### Xstrata Coal Queensland – Oaky Creek No.1

#### The Problem or Initiative

##### a) Identified problem

- Currently laying out Longwall structure during Longwall install has been done the following way:
- Structure gets fixed and bundled up offsite then transported back to site. To minimise volume of the load, the structures get bundled up interlocking each other. The structure bundle is then transported underground on forks to be laid out.
- It requires two men to pull one structure from the bundle at a time due to its heavy weight and the way it's packed.
- This process is quite involved in terms of manual handling and there is potential for serious injuries.



##### b) How the improvement opportunity was identified

- The process of unloading and laying out structure was not carried out in an efficient manner.
- A large amount of structure gets transported and stored in cut through until such time that it is required to be laid out.
- This meant there was the need to double handle the structure, moving it from the cut through on to the belt road to unstrap and lay out.
- A further problem was created by the above procedure, double handling the structure meant doubling the likelihood of potentially causing an injury due to the additional manual handling required.

##### c) What health and safety consequences were to be addressed

- The main health and safety consequence to be addressed would be manual handling injuries such as back and hand injuries.
- In the process of separating the structure an underground worker has sustained a crush injury to his thumb.
- This further increased the urgency of completing and finalising the design and manufacture of the structure cassette.

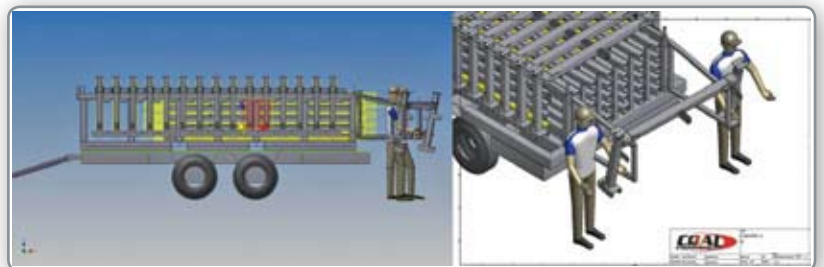
#### The Solution

##### a) Strategies and initiatives developed to identify and address the problem

- Oaky Creek Engineers came up with the concept and passed the information to Coal Engineering to complete concept 3D CAD drawings.

##### b) Internal and external resources used

- After final concept approval the design was forwarded to KEETECH - Mechanical Design for Mines & Manufacturers along with all required parameters needed to complete an engineering analysis to certify that the equipment will be fit for purpose.
- The cassette pod is shown below. The cassette is used on a suitable trailer where it is securely located and restrained from movement. Side fork pockets are used for loading and unloading the cassette pod.
- Assessments of stability and structural integrity are based on design measurements, comparisons with similar existing proven designs, tare mass and the WLL.



##### c) Methods used to trial and test

- After completing a site specific risk assessment with an experienced cross section of the workforce a visit was organized to Coal Engineering to review the manufacturing process and conduct some trials on the prototype.
- Some minor details were missed at the design stage which were identified during the trial and were rectified.



**d) Implementation process**

- On the arrival of the structure cassette on site further trials were completed on surface before officially introducing the new piece of equipment to site.
- A change management procedure was followed along with a Formal Site Specific Risk Assessment.
- A work instruction was also created outlining all steps required to safely load and unload the structure cassette.

**e) Demonstrate how hierarchy of control has been applied**

- The task still needs to be done; therefore the risk has not been eliminated.
- The method on which the structure is transported and handled has been substituted.
- The new procedure takes advantage of an engineered piece of equipment, in this case the structure cassette.
- Change management, Site Introduction and WI have been completed.
- All personnel working on laying out structure will have all required PPE as per Oaky No1 PPE SOPs.

**Benefits / Effects / Outcomes**

**a) Safety and occupational health benefits**

- Improving the process of transporting and laying out structure with the aid of the structure cassette has significantly improved the rate at which Oaky No1 lays out and builds 1500 LW structure, and also greatly reduced the risk of crush and strain related injuries.

**b) Supporting data**

Before (Last LW Block)	After (Current LW Block)
100m of complete structure was laid out and built per shift	200m of complete structure was laid out and built per shift
1 crush finger injury and strained back	No injury

**c) Extent of deployment**

- This is currently operational at Oaky Creek No 1.

**Transferability**

**a) Potential for innovation to be used, modified, transferred across the industry**

- This innovation can be used throughout the industry.
- The cassettes were designed to fit 8T flattop trailers that were available on site but the design can easily be modified to fit on different trailer.

**Innovation**

**a) Originality of the innovation**

- This tool is an excellent example of innovation within tightly defined parameters. The costs both in real dollars and in time to implement the solutions were quite considerable.
- Being able to improve the efficiency of the process by laying out double the amount of complete structures in approximately the same time frame is the very definition of innovation.

**Approximate Cost**

**a) Statement of approximate cost, if known**

- Oaky No.1 has purchased four structure cassettes in total costing approximately \$60,000.