Hydraulic Semi-Automatic Chain Control System
Xstrata Copper Mount Isa Mines

Problem

Maintenance personnel were exposed to potential injury during delivery of wet ore to the U62 and R62 Copper Feeder Rooms, as controlling the wet ore required the installation of a sling around the feeder chute chains. To choke the feeder, this was then tightened with a chain block attached to a beam positioned behind the chutes. Although taking approximately 20 minutes to complete this process, it did not completely choke off the feeder. A recent Level 3 High Potential incident demonstrated both the risk of personal injury and the significant time taken to set up the chain block and slings. An engineering solution was deemed the most appropriate control.

Solution

A hydraulic semi–automatic chain control system on the U1A Feeder Swing Chute, aimed at both removing personnel from and controlling the flow of wet material, was designed, developed and installed. A second prototype was installed on the U1B Feeder Room Chute. Using one hydraulic ram, this removes the need to lift and lower the chute. Both applications are being successfully trialed for effectiveness and operational ease and safety.

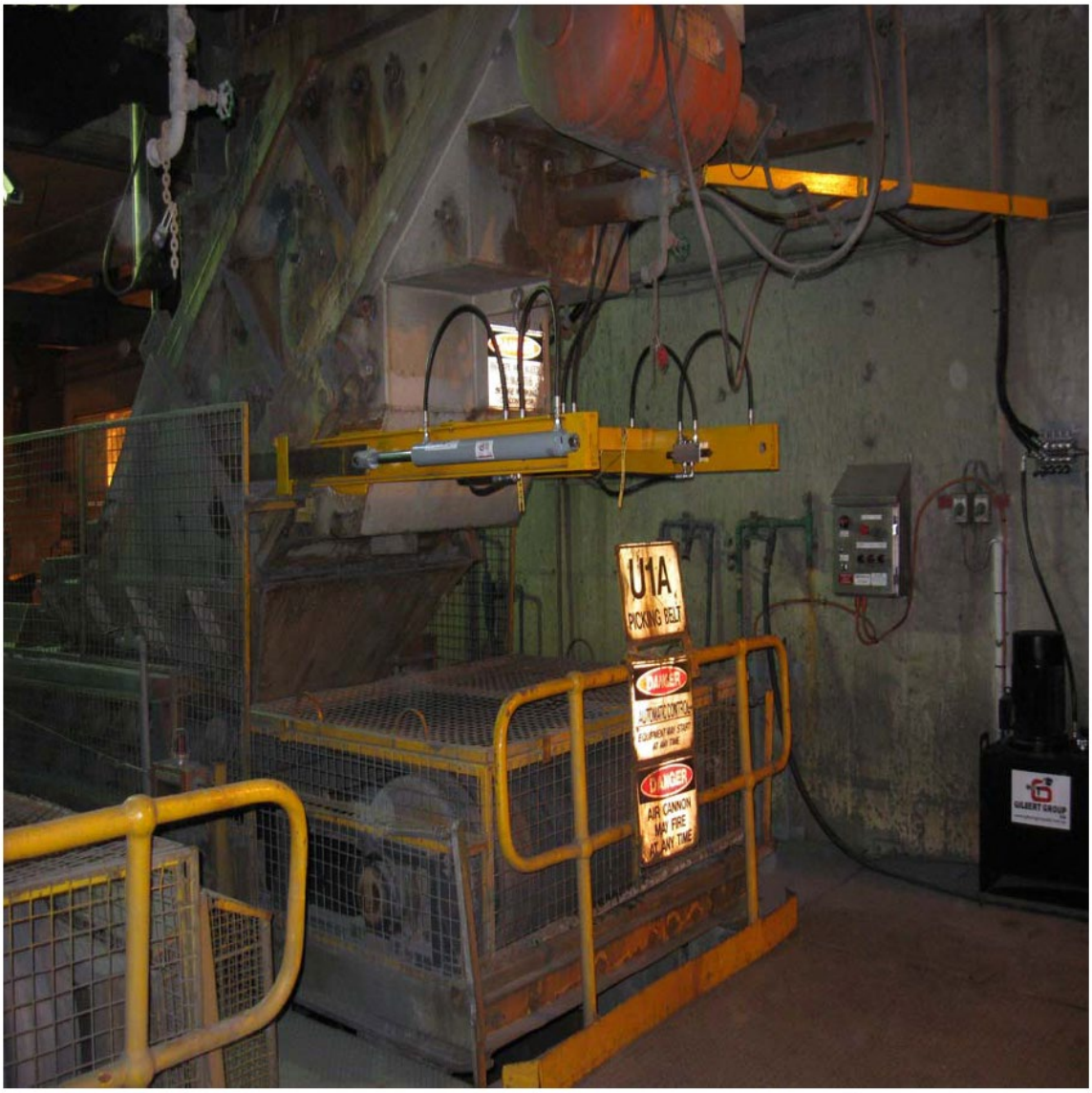

Figure 1: U1A Feeder Swing Chute

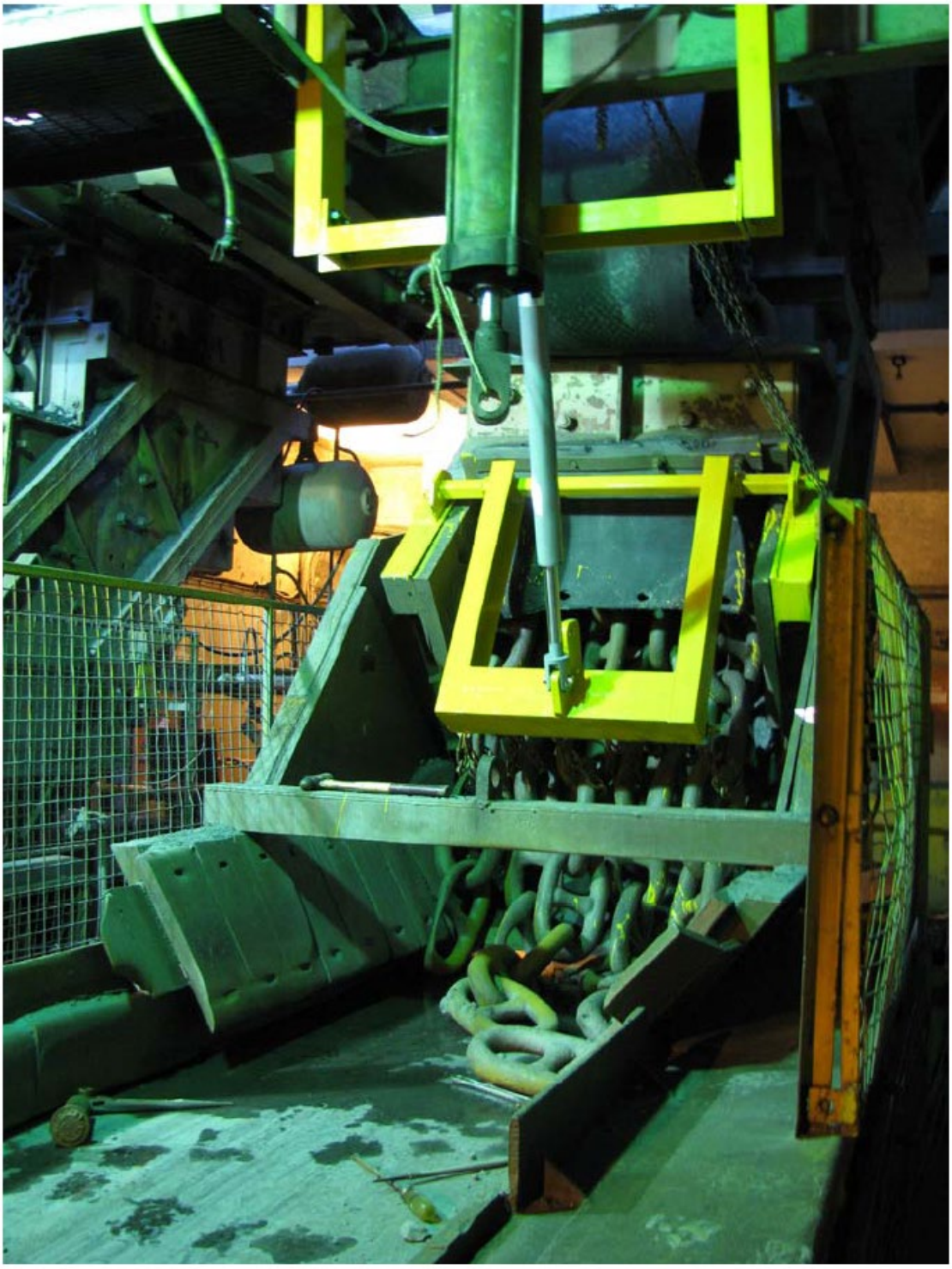

Figure 2: U1B Feeder Chute Room

Benefits and Effects

1. Greatly Increases the safety of personnel:
    - By automating the process, the risk of personal injury resulting from manual handling has been eliminated as there is no preparation time involved in choking the feeder.
    - Having greater control of the flow of wet ore also reduces the operator's exposure to a mud rush. Upon notification that wet ore is to be hoisted into the Ore Bin above U62 or R62 Copper Feeder Room, the operator can immediately choke off the ore flow to prevent an uncontrolled movement of ore, thus enabling accurate control. The semi-automated system removes the operator from risk as they can safely operate the chain adjustment.

2. Cost saving through greater efficiency:
    - Time-saving of at least 20 minutes each time the semi-automated system is used.
    - Greater control of ore flow minimises time spent cleaning up wet ore spillage.

Transferability across Industry

This innovation can be used on any mine site (or in a related industry) in hoisting operations, or where feeder assemblies and chutes are used. The system can be adapted to suit and successful trials have already seen this system installed in the both the U62 and R62 Feeder Rooms, with other applications being considered in crushing and conveying and surface and underground hoisting.

Innovation

The innovative features of this are:

- Provides a physical barrier
- Easily adapted
- Ease of operation
- Automated process
- Transferable to other feeder assemblies/chutes
- The components are easily maintained