

Tail Pulley Arm Amputation

Synopsis

On Saturday, April 21, 2018, a worker was seriously injured at a gravel pit. The worker was attempting to free stuck rocks in the tail pulley section of a conveyor system of a portable crushing unit. The worker had the engine running to bump the conveyor ahead in between attempting to free rocks trapped within the drum. When the rock was freed from the conveyor, it began to turn, entangling the worker's arm in the tail pulley. As a result of their injuries, the forearm segment of their right arm was amputated.



FIGURE 1. Portable Crushing Unit

Findings

After the incident was reported to the Ministry of Energy, Mines and Low Carbon Innovation as per the Health, Safety and Reclamation Code for Mines in British Columbia, an investigation, pursuant to Section 7 of the *Mines Act*, was initiated by the Chief Inspector of Mines (CIM).

Investigators found several contributing factors and conditions:

Shift	Saturday overtime
V-plough	Device designed to deflect rocks may have been broken.
Decision Making	Decision to deviate from the safe work plan and not lock out.
Bypass Guarding	Active decision to bypass natural guarding by raising and reclining underneath the machine during operation.
Training	Second helper was untrained on the operating equipment.
Social Pressure	Untrained helper compelled to help as directed by supervisor.
Environment	Noise from running machine.
Miscommunication	Visual and auditory cues were compromised.

This incident occurred because a worker placed themselves too close to an operating conveyor to clear rocks from a tail pulley and by bypassing the protection provided by locking out energized equipment. They had a mistaken belief that they were safe in doing so from having performed the task previously by themselves.

A lock-out procedure was in place at the mine and the worker had been trained in the lock-out procedure and had recently been provided with training in the operation of the involved equipment. They also demonstrated knowledge of lock-out and a comprehensive understanding of the operation of the portable crushing unit. While the worker's actions contravened the mine lockout policy and that of the HSR Code pursuant to section 4.11.2 Lock-out Procedures, the awkward location of the Lock-out location may have contributed to their decision to not lock the equipment out.

The witness reported they felt compelled to assist the worker, who was their supervisor, even though they did not feel comfortable. The witness was provided guidance from the Inspectors during their interview about the right to refuse unsafe work.

Outcome

Outside of the orders issued to the mine manager and to the equipment supplier, no enforcement actions were recommended with respect to the injured worker. They have experienced life-altering consequences as a result of the decisions they made, and it would not be in the public interest to impose sanction upon this individual.

The following summarizes the recommendations from this investigation.

1. Ministry inspections remind operators of Lock-out procedures – the SW regional H&S inspectors have provided additional reminders of the importance of lock-out procedures during other inspections at various sites throughout the region.
2. Consider as an industry best practice, more than one operator – When operating specialized equipment, a best practice may include that a minimum of two persons per working area or site, are trained in the safe operation and emergency stopping of equipment. This would assist in hazard recognition, task planning and during an emergency.
3. Ministry to issue Hazard Alert – [‘Right to refuse Unsafe Work’](#) – Through the issuance of a hazard alert, workers can be reminded about their right to refuse unsafe work in the Mining industry pursuant to HSR Code section 1.10.