



# TRAINZCO ACCIDENT AND INCIDENT INVESTIGATION



*(including near misses and incidents of unsafe acts or conditions)*

*The purpose of this investigation is to prevent recurrence of accidents etc. It is not the intention to attribute blame to an individual. Please record as much detail as possible to assist in prevention of future accidents or incidents.*

**Date of Accident/Incident** 18 / Aug / 2009 **Time of Accident/Incident** 1:30 PM

## EMPLOYEE PARTICULARS

**NAME:** Adam ?? ?? 33 –05/05/1976 WhoKnows St, Palmerston Nth 123 4567  
**(Given Names) (Surname) Age – DOB Address Phone Number**

**LOCATION OF ACCIDENT/INCIDENT:** Quarry off Mountain Rd

## DETAILS OF INJURY/DAMAGE:

Fracture of left forearm (shaft ulna), left hand and fingers (phalanx), soft tissue injuries to left arm and hand

**OUTCOME:** Death ----- Serious  Minor ----- Near Miss -----

## CAUSE OF ACCIDENT/INCIDENT:

A serious harm injury occurred at the Mountain Road Quarry operated by xxxxx Ltd on 18 August 2009. On site were the victim Adam ??? (Excavator operator), Wayne XX (maintenance engineer), Clayton @@ (loader operator) and Ray %% (crusher operator).

At the time of the incident Adam ??? was using his excavator which was on a stockpile, to load the hoppers of the two crushers on site. Ray %% was operating the 1966 Kue-Ken Crusher (Engine No: S485665 – Machine No: 4949) and from his operator position had a clear view of Adam's excavator track gear and boom. The conveyor of the Kue-Ken crusher was not tracking correctly and Wayne XX had been called to make adjustments to the drive drums alignment. The Kue-Ken crusher unit was isolated so product would not get on the conveyor belt while adjustments were being made.

Ray %% dismounted from the crusher and was directed by Wayne XX to move to the container which housed the electrics for the crusher so he could activate the emergency kill switch if necessary. Ray moved off the crusher and was making his way to the container when he heard a cry "Turn it off!" from Adam. Ray looked over his shoulder and saw that Adam had been trapped in between the conveyor belt and drive drum so he rushed to the container and hit the kill switch. Clayton @@ also heard the cry "Turn it off" and he stopped greasing the loader and rushed over to the site to assist in freeing Adam from the conveyor. Wayne also heard the cry to "Turn it off" and moved around the end of the conveyor to find Adam caught in the conveyor.

All three staff then backed the conveyor manually so that Adam could be freed. First Aid was provided by Clayton and Wayne while Ray notified the emergency services and the office. Adam was then loaded into the crew van and driven to Palmerston North hospital by Clayton where he was treated for a broken left forearm and bones in his left hand by Dr J. Enedlbinder. Witness statements on page 5 and 6.

**PROPERTY DAMAGE: (Details):** Nothing to plant or vehicles

## CONDITIONS EXISTING AT TIME OF INCIDENT:

**a: lighting** Good  
**b: temperature** Approx 15°C  
**c: noise** Less than normal as crusher was not operating at time of incident  
**d: dust/fumes** Nil  
**e: housekeeping** Site was typical for an operational quarry,  
**f: other factors** Surface terrain was crushed rock and stockpiles of river run a crushed metal

A typical mobile quarry operation, extracting river-run from the riverbed, trucking on site where it's stockpiled and crushed into aggregate, to be used primarily with roading projects.

What are the chances of this incident re-occurring?

Minor     Occasional     Hardly Ever

What is the worst case scenario that could have occurred (explain your reasoning)?

Death     Serious Injury     Minor Injury

### CONTRIBUTING FACTORS AND DETAILS OF PREVIOUS NEAR MISSES:

There have not been any records kept in regards to incidents and near misses with this item of equipment. When the machine was purchased second hand 4 to 5 years ago a hazard analysis was undertaken by the team operating the gear. It was decided that new guards be fitted over drive belt pullies, conveyor head drive motor and pullies. A kill switch was also fitted so the crusher operator could turn off the unit for safety reasons in a prominent position (see photo 2). All other electrics are contained within a waterproof lockable container with extension cords used to connect up equipment.

### Block out possible deficiencies which may have contributed to the accident or incident

<input checked="" type="checkbox"/> Planning layout and design	<input type="checkbox"/> Supervision
<input type="checkbox"/> Safety rules or equipment	<input checked="" type="checkbox"/> Employee training
<input type="checkbox"/> Enforcement of safety rules	<input type="checkbox"/> Employee safety consciousness
<input checked="" type="checkbox"/> Operational procedures	<input checked="" type="checkbox"/> Availability of equipment/tools
<input checked="" type="checkbox"/> Enforcement of proper procedures	<input type="checkbox"/> Maintenance of equipment/tools

### DEFICIENCIES:

#### Planning and design

The operation end of the conveyor is unguarded which allowed Adam to get his hand and arm into a position where it could be trapped.

#### Operating Procedures and Enforcement

There are verbal directions and instructions issued to the team working in the quarry however there is no evidence of safe operating procedures being in place which can lead to complacency and confusing about what is meant to happen and what actually occurs;

- Crusher operator moving from the vantage point where the whole worksite can be observed to isolate the crusher
- Maintenance operator making adjustments without someone who can instantly isolate power source
- Excavator operator leaving his work station to do a task without gaining conformation from others on site

#### Training

The team although trained in their work and are all competent in their respective tasks were able to leave their designated post and undertake other work outside their initial scope:

- Excavator operator assisting with adjusting belts without any acknowledgement from others
- Crusher operator allowed to leave post and not immediately return once tasks had been completed

#### Tools and Equipment

If a ring spanner was used then slippage on nuts is minimised.

### ACTIONS TO BE TAKEN TO PREVENT RECURRENCE

Guards to be manufactured to prevent inadvertent access while still enabling effective adjustments to be made (see photos page 4): to be completed by 3 September 2009

Develop safe operating procedures for XXXXX quarry operations with input from on site team to include; maintenance checks; tool use; operator position and processors; visitor administration and induction; start-up/shut-down procedures; emergencies and formation points: to be completed by end of September 2009

Train staff on new procedures and check to see if the SOP is operating effectively: to be completed by end of October 2009

**Photographs**

**Conveyor and drive drum**



**1966 Kue-Ken Mobile Crusher Unit**



**View showing the Crusher Operators vantage point and electrics**

**Proposed Guarding Photographs**



**Suggested Guarding for left side of conveyor drive drum**



**Suggested Guarding for right side of conveyor drive drum**

**Accident/Incident investigated by:** Jeremy Palmer

**Date of Investigation:** 26/28 August 2009

**Name of Doctor/Hospital:** Dr J. Enedlbinder Palmerston North Public Hospital

**Witness (Name):** Adam Liverton

**THE FOLLOWING STATEMENTS HAVE BEEN MADE IN REGARDS TO THIS INCIDENT;**

**ADAM ??** – Victim – Interviewed 28 August

I was in my excavator and from where I was I could see Clayton greasing his loader. The crusher was turned off and Wayne was on the right side of the conveyor, standing on the metal pile. He started making adjustment to the drive roller so I thought that I would give him a hand so I got out of my digger and went to the van to pick up my crescent. I moved around the left side of the conveyor

*Did anybody see you or know you were there?*

I think so, maybe, I don't know.

*Was maintaining the crusher part of your normal job?*

Yes it was my job to fix things if they went wrong, make minor adjustment to the drives, and belts if they weren't running true, that sort of thing

*So where was Ray %%?*

I think he was in the container... I then got up to the roller and started to undo the lock nut using my crescent. As I was pushing away from me, towards the roller, the crescent slipped under the drive drum and bottom of the conveyor belt. Instead of letting go I tried to pull the crescent out but it dragged my hand and arm into the roller (*see photo 1 for pinch point between roller and belt*).

My hand and arm then got pulled around the roller so I screamed out "Turn it off!, Stop it!" Ray turned it off and came running up at the same time Wayne came round to see me and Clayton turn up.

*So you were hanging there?*

I was trapped, so they loosen the belt and backed it off my arm. When I got my hand out I had a crushed hand and broken forearm and big cut on my forearm.

*Who did the first aid?*

Clayton got a cloth to stem the blood and Wayne put a bandage tight around my forearm like a tourniquet.

*What was Ray doing?*

He took the tanker off the van so we could go to town. Clayton took me.

*What injuries have suffered?*

I've broke the tips of middle finger and little finger, they amputated the tip of my little finger and fixed the middle finger. My ring finger was crushed and the nails been ripped off. My forearm broken and they've fixed the big cut on my forearm.

I, Adam ?? ?? , agree with the above statement that was given to Jeremy Palmer on 28 August 2009

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

**WAYNE XX**

The crusher unit was off and I was making adjustment to the right-hand screw on the conveyor drive drum so it would track properly. I was standing on the metal pile (*see photo 1 for height of pile*). Next thing I know Adam was screaming "Stop It!" so I quickly moved around the end of the conveyor and started helping Adam.

*Was the conveyor still going?*

At that stage Ray was between the crusher and the container, I had told him to get there in case I needed the conveyor to be turn off. He rushed into the container and hit the kill switch.

*Were you aware that Adam was there?*

No last time I check he was in his digger and I couldn't see him from my side of the conveyor

*How long do think it was from when you saw him in the digger before he got trapped?*

About 3 minutes I would guess.

*So what happened next?*

We backed the conveyor off by hand as there's no reverse and freed Adam, Clayton and I started doing first aid on him while Ray took the trailer off the van. Clayton then took him into hospital.

*Whose tools was he using?*

I think they were his, mine were on the stockpile but he has his own tools on site because does repairs to his digger and helps out around the place.

I, Wayne XX, agree with the above statement that was given to Jeremy Palmer on 26 August 2009

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

**RAY %%**

I had got down off the crusher once I set the conveyor going so Wayne to fix it. I was walking towards the container when I heard Adam scream out. I looked over my shoulder and saw him trapped in the end of the conveyor. I quickly rushed to the conveyor, hit the kill switch and turned it off. We then started to wind the belt back to get him free.

*How long do think it was, from when you saw him last in the digger, before he got trapped?*

I would guess it was about 3 minutes from when I saw the digger working.

*From where you stand on the crusher can you see the whole operation?*

I can see the digger bucket moving and the track gear, so I see movement when the digger moves. I can also see the conveyor and most of the yard. I've got a kill switch besides where I am so I can turn it off.

*Why did get down from the crusher?*

I got down so I could turn off the crusher. The kill switch where I stand turns off everything and Wayne needed the belt to work, so he could adjust it. Wayne told me to go the container and I was halfway there when Adam screamed out "Turn it off!"

I, Ray %, agree with the above statement that was given to Jeremy Palmer on 26 August 2009

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

**CLAYTON @@**

I had asked Wayne if he needed a hand and he said "No, I'll yell out if you're needed". I went off to grease my loader when I heard Adam screaming "Turn it off!" I ran to assist in getting him out of the belt, I then did first aid on him with Wayne, I then drove him to hospital.

I, Clayton @, agree with the above statement that was given to Ross Todd on 24 August 2009

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date