



## FINDING OF INQUEST

*An Inquest taken on behalf of our Sovereign Lady the Queen at Adelaide in the State of South Australia, on the 26<sup>th</sup>, 27<sup>th</sup>, 28<sup>th</sup>, 29<sup>th</sup> and 30<sup>th</sup> days of September 2011, the 19<sup>th</sup> and 20<sup>th</sup> days of December 2011 and the 11<sup>th</sup> day of September 2012, by the Coroner's Court of the said State, constituted of Mark Frederick Johns, State Coroner, into the death of Kym Charles Greenhalgh.*

*The said Court finds that Kym Charles Greenhalgh aged 50 YEARS, late of 3 Menzies Court, Trott Park, South Australia died at Kondoparinga Road via Meadows, South Australia on the 1<sup>st</sup> day of April 2008 as a result of multiple injuries. The said Court finds that the circumstances of his death were as follows:*

### **1. Introduction and cause of death**

- 1.1. Mr Greenhalgh was 50 years of age as at the date of his death on 1 April 2008. On that day Mr Greenhalgh was working for his employer, Pioneer Road Services<sup>1</sup>, spray sealing a road near Meadows. He was working in the vicinity of the rear of a truck on the roadway when he was struck by a road roller that had been following the truck. He died at the scene.
- 1.2. An autopsy was conducted by Dr Gilbert, forensic pathologist. Dr Gilbert gave the cause of death as multiple injuries, and I so find<sup>2</sup>.

### **2. The events of 1 April 2008**

- 2.1. Mr Greenhalgh's role on that day was to walk behind a truck that was driving over the newly laid bitumen. He would identify what were described as 'patches' in the newly

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<sup>1</sup> Pioneer Road Services was taken over by Fulton Hogan in 2009 at a date following the death of Mr Greenhalgh

<sup>2</sup> Exhibit C3a

laid surface. He would use his shovel to take aggregate from the back of the truck to fill in the patches. In the meantime, heavy rollers would be driving up and down the newly laid section of road compacting and smoothing the surface. The team would work on sections of one to two kilometres at a time.

- 2.2. One of the rollers was being driven by Mr Clive Fisher who had been employed by the company for some 30 years. Mr Greenhalgh was also a long term employee. Unfortunately Mr Fisher died sometime after this incident, and before the Inquest was held. As a result it was not possible to take oral evidence from him. Notwithstanding this, it was possible to obtain his account by virtue of a statement he gave to Senior Inspector David Barrett of SafeWork SA on 17 April 2008<sup>3</sup>. Mr Fisher gave the following account.
- 2.3. The patching truck behind which Mr Greenhalgh was working was on the normal side of the road heading away from Meadows. Mr Fisher was reversing his multi-tyred roller in the same direction and coming up behind the patching truck. As the roller was reversing, Mr Fisher was having to look over his left shoulder. There were two other rollers working as part of the team, but they were not in the vicinity at the time. Mr Fisher said:

'As I came up closer to the truck I started to manoeuvre around the truck to overtake him on his driver's side. The truck was also moving a little slower than I was, about walking pace. I had made eye contact with Seagull<sup>4</sup> as I went to pass the truck. He was working on the driver's side rear corner of the truck and I know he seen me because he stepped to the left side of the truck so I could pass. He is not silly, he knows to get out of the way of the rollers when they are coming. I had come alongside of the truck travelling at a steady jogging pace when I noticed the roller had started to drift towards the truck. I was steering with my right hand. The steering wheel is about my shoulder height. I went to correct the steering but I accidentally turned the wheel the same way which made the roller move even more the same way instead of straightening it up. Because the steering is hydraulic it is not direct like a car and there is a steering lag when you travel in reverse. If you travel forward the steering is quicker to respond and is more direct. By this time the truck had moved up the road and I went to correct the steering again but it still accidentally turned it the same way. This started bringing the back right around and I thought I was going to hit the truck, so I went to push the foot brake and realised it doesn't have one. I then reached for the forward/reverse lever to put it into neutral. At this point in time, while I was reaching for the lever, I hit the tree.'<sup>5</sup>

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<sup>3</sup> Exhibit C19c

<sup>4</sup> Seagull is Mr Greenhalgh's nickname

<sup>5</sup> Exhibit C19c

- 2.4. After the accident, and before his own death, Mr Fisher gave further accounts of the event to the witnesses Mr Symington and Mr Fountain. He told the former words to the effect that he was not sure why he had made the steering error, and he thought he had panicked<sup>6</sup>. He told the latter that it was a case of 'human error' and that there was no mechanical problem with the roller that had contributed<sup>7</sup>.
- 2.5. We now know that Mr Fisher's roller steered a course that was travelling behind and parallel with the truck and was on a course to overtake the truck. It appears that the roller's direction had taken it towards the truck and Mr Fisher attempted to alter the course of the roller to take it past the truck on the truck driver's side. Instead, he caused the roller to travel around behind the truck in a turning movement. The photographic evidence in this case shows the final resting position of the roller. It came to rest against a tree on the side of the road. Its attitude at its resting position was at an angle of 90° to the direction of the road. The path travelled by the roller was a sharp turn from approximately the centre of the road, heading left according to the direction of travel of the truck and the roller, and coming in behind and close to the truck finishing at 90° to its original direction of travel. In the course of this manoeuvre, the roller struck Mr Greenhalgh who had moved from the driver's side of the truck and immediately behind it, to the rear of the truck on the passenger's side. No doubt Mr Greenhalgh was not expecting the roller to suddenly swerve in his direction. He may not have been facing the roller in order to see what was happening, or it may have all happened too quickly for him to get out of the way.
- 2.6. The patching truck was being driven by another member of the team, Mr Cooper. Mr Cooper's account was that the incident occurred at approximately 3:40pm. He said he was driving forward slowly on the left hand side of the road, stopping and going forward as required. He said that the rollers were going up and down the road as they still had half an hour of rolling time, at least, to compress the stones into the bitumen. As he was going forward slowly he heard the noise of a roller from behind the truck. He said that it was making a noise which he said was not normal. He said:

'It was like they had gone from forward to reverse in a hurry or vice versa.'<sup>8</sup>

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<sup>6</sup> Transcript, page 67

<sup>7</sup> Transcript, pages 438-440

<sup>8</sup> Exhibit C30

He said he looked in the right hand mirror and he could see a roller 'sideways on the right hand side and about a metre behind the truck'. He said he saw Mr Fisher, the driver of the roller, 'semi-standing on the roller, leaning slightly forward trying to steer and push the accelerator stick forward'. He then looked in the left hand mirror of the truck and saw the roller coming out from behind the truck on the left hand side and coming into contact with a tree on that side of the road. He put the parking brake on and went around to the rear of the truck where he saw that Mr Greenhalgh had been struck by the roller. Mr Cooper's account of the event is consistent with Mr Fisher's and lends weight to my conclusion about the path followed by the roller.

### **3. The multi-tyred roller**

- 3.1. The roller being driven by Mr Fisher was a Dynapac DM83 multi-tyred roller. It had a fixed seat and a steering wheel and a lever which could be moved forward to go forward and pulled backwards to go in reverse. Pioneer Road Services had arranged for the roller to be fitted with what was described as a 'deadman's plate' which, as the name suggests, was a plate on the floor of the cab. The plate was hinged at one end and when weight was placed upon it the roller could be driven in a forward or reverse direction. When weight was taken off the plate and it hinged upwards, the roller would not proceed. The plate was fitted with a spring or some other device that meant that it would return to the deactivated state – that is it would hinge upwards – when no weight was being placed upon it. As soon as weight was placed upon it the vehicle could be driven and once the weight was lifted from the plate, it would hinge upwards and in that state the vehicle could no longer be driven. The Court held a view of a demonstration of the roller. I noted that when the roller was proceeding at its normal operating speed, namely a jogging pace, and the driver released the footplate, the roller would not stop immediately but would roll to a halt within a relatively short distance.
- 3.2. The roller was steered by means of a steering wheel to which I have already made reference. Unlike a motor vehicle, the steering wheel would not return of its own accord to the centre position when the roller was in motion. In other words, if the steering wheel were turned to the left or the right and nothing further was done, the roller would continue in that direction even if the driver was not holding the steering wheel to the left or the right as the case may be. In order to regain a neutral straight ahead course, the driver would have to adjust the steering wheel to bring the roller

onto the desired course. Furthermore, unlike a car, the steering wheel could be turned multiple times in the one direction without coming to a stop. This would not mean that the front steering wheels would continue to turn in that same direction – they would come to a stop at the limit of their turning capacity – but the steering wheel itself could be turned notwithstanding that the limit of the front wheel had been reached. This was because the steering was hydraulically actuated.

- 3.3. The roller was not fitted with a foot brake. In order to bring the roller to a halt there were three options. The first option was for the driver simply to lift his weight off the footplate. The second would be to place the forward/reverse lever in the neutral position. The third would be to activate the parking brake switch on the dashboard. Unlike a motor vehicle the DM83 did not have a foot activated braking device.
- 3.4. I have already commented that the DM83 had a fixed seat facing, as one would expect, a forward direction of travel. However, the method of work for a spray sealing team was such that it was necessary for the rollers to pass backwards and forwards over the one to two kilometre stretch of new roadwork multiple times. The evidence provided by Pioneer Road Services was that it was not practicable for the multi rollers to execute a turn at the limit of their passes over the new road surface. Accordingly, it was necessary for the rollers to proceed in a forward direction for one pass, and for the next pass to reverse over the work. The upshot is that the rollers would spend as much time in reverse motion as they would in forward motion. Because the seat of the DM83 did not swivel this would necessitate that the driver would have to look over his shoulder in reverse for half of a working day. By the time the accident occurred, Mr Fisher had been operating the DM83 for some 6 to 7 hours. It can therefore be assumed that for some 3 or more hours he had been operating the vehicle in reverse with his head turned to look over his shoulder. While operating it in that mode he would also have to hold onto the steering wheel and the forward/reverse lever as well. In my view this was a most unsatisfactory method of working, a subject to which I will return later.
- 3.5. It is worth repeating that at the time of the incident Mr Fisher was driving the DM83 in a reverse direction.
- 3.6. I should also add that when going in reverse, the DM83 made a beeping sound as a form of warning.

- 3.7. It is significant that in the account given by Mr Fisher he stated that he ‘went to push the foot brake and realised it doesn’t have one’<sup>9</sup>. Later in his interview he said:

‘The competency for the roller I first obtained was for a ‘More’ and a ‘TC30’ roller which both had foot brakes. The new multi rollers, which I had seen in the yard and never driven, did not have a foot brake, which I’m used to.’<sup>10</sup>

- 3.8. The evidence established that Pioneer Road Services had purchased the Dynapac rollers new from the manufacturer in 2003. After that time the old rollers, which did have foot brakes, were phased out and from approximately 2004 the company no longer had rollers with foot brakes.
- 3.9. Although the witness, Mr Fountain, expressed some surprise that Mr Fisher said he had never driven the DM83 type roller before, I have no reason not to accept Mr Fisher’s statement to that effect in his record of interview<sup>11</sup>. I therefore find that Mr Fisher had not driven the DM83 previously.

#### **4. Training and induction**

- 4.1. The evidence established that in order to drive a multi roller, one needed to have a heavy vehicle driver’s licence and there were no other legal requirements. Mr Fisher did indeed have a heavy vehicle driver’s licence. In addition to that qualification, the company implemented its own training and licensing system called TALS. It was aimed at the operation of plant specifically within the company. It included both theoretical and practical components as well as ongoing monitoring by the foreman and leading hands of any crews. Evidence was given by Mr Gallucci, an employee of the company, in which he outlined the TALS system. An operator was required to renew his TALS qualification after 10 years<sup>12</sup>. Furthermore, the company held a ‘back to school day’ annually which was aimed at reiterating company policies and safety procedures<sup>13</sup>.
- 4.2. There was conflicting evidence as to whether Mr Fisher was given some form of induction into the use of the machine on the morning of 1 April 2008. In the event, I do not think much turns on this. It is clear that Mr Fisher felt that he was competent to operate the machine and the evidence suggests that he may have provided some

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<sup>9</sup> Exhibit C19c

<sup>10</sup> Exhibit C19c

<sup>11</sup> Exhibit C19c

<sup>12</sup> Transcript, page 325

<sup>13</sup> Transcript, page 335

form of verbal assurance to those offering to guide him through the use of the machine that he was already familiar with it. This is at odds with his statement in his record of interview that he had not driven the DM83 before<sup>14</sup>, however he had certainly driven rollers in the past, and that may account for his somewhat dismissive attitude for the need for an induction that day.

- 4.3. What is plain is that Mr Fisher thought, in the heat of the moment, that the DM83 had a foot brake and he was attempting to use the foot brake in the precious few moments before he ran over Mr Greenhalgh. He clearly was not sufficiently familiar with the operation of the machine to make the right decision in a moment of crisis.

## **5. Maintenance of the DM83**

- 5.1. There was a considerable amount of evidence as to the maintenance, or lack thereof, for the DM83. It is not necessary for me to traverse all of this evidence. It is sufficient to say that I was satisfied that no mechanical fault in the DM83 played any part in the tragic death of Mr Greenhalgh. There was evidence to suggest that the footplate would sometimes stick in the off position. In that position, of course, the DM83 is unable to move at all. Clearly any such fault, if it existed at all, had nothing to do with the events surrounding Mr Greenhalgh's death. Furthermore, a mechanical inspection was carried out by the witness, Mr Fountain, an employee of the company, the day before the incident. He found no fault with the machine that would have made it unsafe to operate. There is also Mr Fisher's comments to Messrs Symington and Fountain to support the view that no mechanical problem contributed to the accident<sup>15</sup>.

- 5.2. In summary, I find that the machine had no mechanical fault that contributed in any way to the tragic accident.

## **6. Conclusion as to cause of accident**

- 6.1. In my opinion, the evidence establishes that Mr Fisher made what I would describe as a human error. As the roller started to move off a course that would have taken it past the outside of the truck – probably because of the camber on the road towards the left hand side at that point – Mr Fisher corrected the steering but in the wrong direction.

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<sup>14</sup> Exhibit C19c

<sup>15</sup> Transcript, pages 67, 438-440

Because of the lag in the response of the steering system to a steering input of that kind, he was not immediately aware that he had made an error. Once he became aware of the fact that he had made an error, he unfortunately repeated the same incorrect steering input. At that point he realised that he was in difficulty and attempted to stop the roller by pressing a foot brake which did not exist, rather than by removing his weight from the foot plate. The evidence of Mr Cooper is consistent with a person apparently attempting to stand on the foot brake of a vehicle in an effort to stop it. Unfortunately, Mr Fisher was simply applying weight to the deadman's plate which meant that the roller would continue to proceed in the wrong direction and not stop, the very opposite effect of what he was hoping to achieve.

- 6.2. It may well have been that Mr Greenhalgh, who was universally acknowledged as a particularly careful and safety conscious worker, did not see that the roller was heading in his direction. He may have assumed – quite understandably – that he was in a safe position immediately behind the truck. In any event, he did not have an opportunity to take further evasive action. In my opinion, the death of Mr Greenhalgh was a tragic accident.

## **7. The method of operation of rollers**

- 7.1. I have already touched upon the subject of the method of operation which the company, and according to the evidence the wider industry, adopts for the operation of multi rollers. The effect is that the rollers are driven in reverse for as long as they are driven in a forward direction. In my opinion it is extremely unsatisfactory that any worker should be required to spend half of his working day twisted in an attitude which enables him to see over his shoulder while operating a heavy vehicle such as a multi roller. On any view it is reasonable to assume that had Mr Fisher been driving the roller in a forward direction as he approached the truck, he would have been most unlikely to have made the steering errors which he did make. I consider it would be very tiring to drive a roller in reverse for lengthy periods of time and to maintain a proper lookout by twisting and looking over the shoulder.

## **8. Recommendations**

- 8.1. Pursuant to Section 25(2) of the Coroners Act 2003 I am empowered to make recommendations that in the opinion of the Court might prevent, or reduce the likelihood of, a recurrence of an event similar to the event that was the subject of the Inquest.
- 8.2. In my opinion the method of operation of rollers is an inherently unsafe method of work. I recommend that the Minister for Transport and Infrastructure and the Minister for Industrial Relations consider, in conjunction with their interstate and Federal counterparts, a strategy for overcoming this difficulty. I have suggested the involvement of both of these Ministers. The involvement of the Minister for Industrial Relations is self explanatory. The involvement of the Minister for Transport and Infrastructure is suggested because that area of Government commissions much roadwork and therefore has an interest in this matter. I make no comment as to what the solution to this dilemma is. The evidence suggests that for technical reasons relating to new surfaces, it is not feasible to manoeuvre rollers to enable them to turn around at the end of each pass. If that be so, then it should be possible to implement machine designs that would enable an operator to be facing in a forward position while the vehicle is in fact reversing. I simply cannot accept that the present unsatisfactory state of affairs where a driver has to spend half of his working day reversing a vehicle and twisting to look over his shoulder to do so, is the only way in which a road surface can be properly compacted.

*Key Words: Workplace Injury; Construction Safety*

*In witness whereof the said Coroner has hereunto set and subscribed his hand and*

*Seal the 11<sup>th</sup> day of September, 2012.*

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*State Coroner*