IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2008 0964

FINDING INTO DEATH WITHOUT INQUEST

Form 38 Rule 60(2)
*Section 67 of the **Coroners Act 2008***

I, AUDREY JAMIESON, Coroner having investigated the death of DAVID BRUCE SCALE without holding an inquest:

find that the identity of the deceased was DAVID BRUCE SCALE

born on 30 May 1955

and the death occurred on 6 March 2008

at Glen Forbes Road, approximately 100 metres east of the intersection with the Bass Highway, Grantville 3984

from:

1 (a) RUPTURED LIVER AND CHEST INJURIES DUE TO BLUNT FORCE TRAUMA

Pursuant to section 67(2) of the **Coroners Act 2008**, I make findings with respect to **the following circumstances**:

1. Mr David Bruce Scale was 52 years old at the time of his death. He lived at 15 Bourke Crescent, Geelong with his wife, Mrs Gillian Scale.

2. Mr Scale had been employed by Primal Surfacing Pty Ltd (Primal) as a road broom operator since December 2004.[1] He was considered a competent worker and highly experienced in the operation of the road broom mechanism, which is attached to the rear of a Hino truck.

3. At approximately 11.35am on 6 March 2008, Mr Scale was working alone on a road work site near Grantville, Victoria, as part of the Bass Highway duplication project, when he became crushed between the rear of the Hino truck and the hydraulic road broom attachment.

[1] Primal is an independently owned and operated bituminous spray sealing specialist.

4. Mr Scale was able to make several telephone calls for help in the minutes prior to his death. He was located deceased by a work colleague shortly after, with the truck still running, the safety lights operating and the driver's door in the open position.

INVESTIGATIONS

5. Dr Melissa Baker, Forensic Pathologist at the Victorian Institute of Forensic Medicine, performed a post mortem examination on the body of Mr Scale, reviewed a post mortem CT scan and reviewed the Victorian Police Report of Death, Form 83. Anatomical findings included coronary artery atherosclerosis (70-80% stenosis of the left anterior descending coronary artery). Dr Baker explained that in the setting of blood loss and hypoxia, the coronary artery disease might have contributed to death by predisposing Mr Scale to a cardiac arrhythmia. Toxicological analysis of blood retrieved post mortem did not identify the presence of alcohol or other drugs. Dr Baker ascribed the cause of Mr Scale's death to a ruptured liver and chest injuries due to blunt force trauma.

6. The circumstances of Mr Scale's death have been subject to investigation by Victoria Police and WorkSafe Victoria (WorkSafe). Statements were obtained from Mr Scale's co-workers, including his son, Mr Steven Scale, various workers employed by Akron Roads Pty Ltd (Akron),[2] and WorkSafe Inspectors. Independent expert reports were obtained by WorkSafe from mechanical engineer Mr Phillip Hodges and consultant engineer Mr Joseph Pezzimenti.

The vehicle

7. Primal had hired the vehicle from Flindane Pty Ltd (Flindane). The road broom mechanism had been designed, built and fitted to the vehicle by Matthews Brothers Engineering Pty Ltd (MBE), and operated with software installed by Bosch Rexroth Pty Ltd (Bosch). The broom had joystick controls that can only be operated from inside the truck cabin, via Program Logic Control (PLC) in directions of up, down, left and right. It is moved using a Hydraulic Ram fitted at the rear of the truck. The sweeper attachment is approximately 2.7 metres tall, 2.8 metres in length and 0.9 metres in width. The broom is used to sweep the road surface clear.

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[2] Akron Roads Pty Ltd was the principal contractor to VicRoads on the Bass Highway duplication project (near Grantville). Primal was contracted to Akron (letter confirmed contact dated 12 October 2007). Akron Roads Pty Ltd was in administration as at 9 March 2010).

When in use, the broom normally extends away and down from the truck and must return to stow mode when the vehicle is travelling on-road. There are no mechanical or hydraulic lever devices fitted to the rear of the vehicle.

8. Mr Steven Scale had driven the road broom and stated that the broom-stow mechanism had occasionally malfunctioned. He said: 'Occasionally when we packed up, or finished sweeping for the day, the broom might not return to its rest position so you would have to do it again. It usually worked the second time around'.[3]

9. Primal's Daily Safety Plant Checks suggest that Mr Scale had experienced at least one previous difficulty with the broom mechanism – on 12 November 2007, Mr Scale wrote "broom no side shift or up and down".[4] The service records recovered by Inspector Murphy from Whitehorse Truck and Bus (Whitehorse), who serviced the vehicle, contained reference to a routine 9,000km service on 21 December 2007. There was no reference in the records to any reports of difficulties with the broom-stow mechanism. Inspector Murphy attended Whitehorse and spoke with General Manager Mr Steven Evans, who advised that they would not have worked on the broom or the broom's system.[5] It is therefore unclear what action, if any, was taken by Primal in response to Mr Scale's 12 November 2007 entry.

10. An inspection of the vehicle conducted by Mr Hodges confirmed that there was no mechanical means located at the rear of the vehicle that would allow the operator to control the broom mechanism. According to Mr Pezzimenti, the broom mechanism operated correctly when tested. Mr Pezzimenti concluded that no damage could be observed in relation to the wiring and magnetic proximity switches. No issues were found in relation to the joystick operation.

11. WorkSafe Inspector Mr William Grigg stated that a real time non-recording camera was fitted to the truck[6] but he did not state whether it was operational or plugged in when he attended the incident scene. Mr Noel Matthews of MBE provided WorkSafe Inspector Murphy with an undated, unsigned note allegedly made by Mr Scale during an unspecified four-day familiarisation period in which Mr Scale allegedly wrote 'refit camera'. On both occasions when Mr Pezzimenti examined the road broom, the camera was not plugged in. When he

[3] Inquest brief, page 31.

[4] Inquest brief, page 244.

[5] Inquest brief, page 85.

[6] Inquest brief, page 39.

plugged in the camera, it worked effectively.[7] On the evidence available to me I am unable to state whether the camera was working at the time of the incident.

Risk assessment and broom operating instructions

12. It is apparent that Mr Scale was considered proficient in the use of the sweeper, as he had used the same vehicle for some months and a similar device in previous employment. Mr Scale had previously received training in relation to the vehicle's operation and Mr Noel Matthews of MBE stated that Mr Scale was involved in the design and construction of the sweeping mechanism.

13. Primal and MBE provided the following documents detailing the operating procedures and safety protocols of the road broom:

    a. Risk Assessment Road Broom 4 November 2003;[8]

    b. MBE Road Broom Operating Description (undated);[9] and

    c. MBE Broom Operating Instructions (undated).[10]

14. The documents do not appear to directly address how an operator should respond to a failure of the broom stow mechanism. There is however a 'help line' phone number contained in the MBE Broom Operating Instructions, presumably to call for malfunctions and/or emergencies relating to the broom mechanism. There is no evidence that MBE were contacted following Mr Scale's 12 November 2007 notation on the Primal Daily Safety Plant Checks checklist. It is not apparent on the evidence that Mr Scale received training specifically addressing a procedure to follow in the event that the broom mechanism failed.

15. The MBE Broom Operating Instructions and the Risk Assessment provided to Primal by MBE warned of the potential crush points within the broom mechanism. Pictorial signs and signs warning to keep clear were accordingly placed on the mechanism.[11] The Broom Operating Instructions states that in the event a person was required to work in a crush point area, the

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[7] Inquest brief, page 226.

[8] Inquest brief, pages 609 and 613.

[9] Inquest brief, page 537.

[10] Inquest brief, page 485. I note that this document contains a 'help line' phone number to call presumably for malfunctions and/or emergencies relating to the broom mechanism.

[11] See WorkSafe photographs 72-75 for example.

engine must be off and all air receivers must be dumped of pressure. The Risk Assessment states that when working in the crush point area, the control panel isolation switch must be in the 'isolate' position and the vehicle ignition key must be removed and remain in the possession of the person entering the crush point until the work is completed.[12]

16. Mr Scale's son, Mr Steven Scale, who performed the same job for Primal and worked alongside his father, could not recall ever seeing written instructions in relation to safe operating procedures, nor could he recall receiving verbal instructions.[13]

17. It appears that contrary to the Broom Operating Instructions and Risk Assessment, Mr Scale placed himself in the crush zone while the vehicle was running.

Site specific induction

18. Akron inducted Mr Scale on 8 October 2007 and 12 November 2007. A site-specific induction and OHS policies were provided to Mr Scale and signed by him on 2 February 2008. Site-specific Safe Operating Work Instructions (SOWIs) were shown and explained to Mr Scale, who acknowledged by signature that he had read them. The SOWIs were kept onsite in the communal crib room. Regular site toolbox meetings were held along with an ongoing requirement to report site hazards. Mr Scale had worked on the Bass Highway duplication project for two to three weeks prior to the incident.

How the incident occurred

19. Although there were no witnesses to the incident, the surrounding circumstances suggest that Mr Scale may have attempted to adjust the broom slew proximity switch at the time because the broom failed to stow completely. The purpose of such a switch was to allow the sweeper broom to self-locate into stow mode for transportation. This suggests that Mr Scale entered the crush zone in order to investigate a problem with the broom stow mechanism while the vehicle was still running.

20. According to Mr Pezzimenti, Mr Scale may have felt safe within the potential crush zone, as normally, for any movement of the broom to take place, the joystick inside the vehicle cabin would need to be operated. A possible reason for why Mr Scale did not remove the ignition

[12] Inquest brief, page 609.

[13] See page 2/3 of statement of Steven Scale.

key was to enable him to detect a problem; otherwise, the control system would have been reset. With the engine running the pneumatic and hydraulic control valves would have had full operating pressure available. If the status of a field device changed, the solenoid valves could be energised and unexpected movement could occur.[14]

WorkSafe Victoria investigation outcome

21. Following an investigation, WorkSafe Victoria determined not to prosecute Primal for breaches of the *Occupational Health and Safety Act 2004* (Vic).

Prevention measures

22. Mr Phillip Hodges recommended that in order to prevent the incident from recurring, four emergency stop buttons should be installed at the rear of the vehicle in reach of a person facing rearward or forward. This would completely isolate any movement of the sweeper broom mechanism in the event a person did enter the restricted area.[15] These safety switches need to be of a failsafe type – once they are activated they can be reset from within the vehicle cabin. This would completely isolate any movement of the sweeper broom mechanism in the event of a person entering the restricted area.

23. Mr Pezzimenti also stated that an emergency stop button installed at the rear of the vehicle, on both sides, might have been of assistance to Mr Scale. He stated that the current electrical control system on the broom mechanism could be de-activated by switching the ignition key off or by pressing the emergency stop button inside the vehicle cabin. All solenoid function should cease immediately once either of these functions are activated. Mr Pezzimenti further stated that the movement of the main broom slew was quick and there would have been little opportunity of avoiding being crushed if a person were standing between the truck and main broom slew. He did not however believe that the circumstances of this incident were foreseeable.

[14] See page 3/7 of statement of Joseph Pezzimenti.

[15] See page 3 of statement of Phillip Hodges.

CPU Research

24. The Coroners Prevention Unit (CPU)[16] researched statistical information relating to workplace deaths in similar circumstances to the death of Mr Scale on behalf of the Coroner.

CPU Statistics

25. Workplace deaths investigated by Victorian Coroners form 1 July 2000 to 30 June 2010 were reviewed to identify the following risk factors:

    a. the worker was working alone at the time of incident;[17]

    b. maintenance on the machinery was being undertaken by the worker at the time of incident; and

    c. the worker entered the machinery crushing zone, causing death.

26. A review of Victorian workplace fatalities identified 18 deaths were the fatal injury was caused by an individual having entered a machinery crushing zone during operation. This represents 7% of workplace deaths, and 11% of workplace deaths involving machinery or equipment. Injuries inflicted from entering a crushing zone were predominantly associated with fixed machinery. Victorian coronial data indicated that machinery crushing zones were implicated in 9% of total Victorian fatalities.

27. According to *Australian Standard 1604: Design of controls, interlocks and guarding – Emergency stop – Principles for design,* an *emergency stop device* is a function which is intended to avert arising or to reduce existing hazards to persons, damage to machinery or to work in progress, and to be initiated by a single human action.

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[16] The Coroners Prevention Unit (CPU) was established in 2008 to strengthen the prevention role of the coroner. The unit assists the coroner with research in matters related to public health and safety and in relation to the formulation of prevention recommendations, as well as assisting in monitoring and evaluating the effectiveness of the recommendations. The CPU comprises a team with training in medicine, nursing, law, public health and the social sciences.

[17] Due to the definition of a 'workplace death' applied for the current analysis, coronial cases identified each year differed to that of official work-related fatality statistics reported by WorkSafe. In a WorkSafe publication, *Working Alone – Identifying and Addressing Risks*, 'working alone' is defined as circumstances where a person is unable to get immediate assistance from colleagues or other people.

28. Where specified (n=256), 31% (n=80) of Victorian workplace deaths involved a person working alone at the time of the incident. In 68% (n=54) of these deaths, the person was also operating machinery or equipment at the time (Table 1). While the machinery/equipment may not have been the primary mechanism causing fatal injury in all circumstances, in most scenarios it was the agent responsible for causing injury. Persons working alone were predominantly using agricultural equipment (mainly tractors) at the time of death. Occupations such as farming are well recognised as a hazardous sector for working alone, given the relative isolation of the workplace.

Table 1: Workplace deaths involving persons working alone, Victoria: July 2000 -June 2010 (n=80)

	n	(%)
Machinery/equipment in use at time of incident	54	(69)
Machinery/equipment type (examples):		
Agricultural vehicle/machinery (tractor)	29	(54)
Fixed machinery (manufacturing plant)	5	(9)
Industrial vehicle (forklift, scissor lift)	5	(9)
All-terrain vehicle (quad bike)	4	(7)
Transport vehicle (stationary)	3	(6)
Lifting and transmission device (crane)	3	(6)
Special construction vehicle/machinery (bulldozer)	3	(6)
Powered hand tool (nail gun, circular saw)	2	(4)
Mechanism of fatal injury		
Transport incidents (e.g. mobile plant rollover)	32	(59)
Exposure to inanimate mechanical forces	25	(46)
Falls	10	(19)
Drowning and submersion	2	(4)
Poisoning	2	(4)
Other threats to breathing	2	(4)
Exposure to electric current	2	(4)
Exposure to smoke, fire, flames	1	(2)
Exposure to animate mechanical force	1	(2)
Still enquiring	1	(2)

29. Of the total workplace deaths identified, machinery or equipment was being used at the time of the fatal incident in 58% (n=159) of deaths. When in use, a maintenance task of some kind was reported as being performed in 19% (n=30).

30. In at least four deaths, a contractor had been engaged to undertake the maintenance task.

31. The type of machinery implicated in the fatalities is summarised in Table 2. Fixed machinery was the most common machinery type involved where persons attempted a maintenance task and received a fatal injury.

Table 2: Fatal injury arising from the maintenance of machinery and equipment

	n	(%)
Machinery/equipment subject to maintenance	**30**	(19)
Machinery/equipment type:		
Fixed machinery	15	(50)
Agricultural vehicle/machinery	5	(17)
Special construction vehicle	4	(13)
Transport vehicle (stationary)	4	(13)
Industrial vehicle	2	(7)
Nature of maintenance task		
Repair	15	(50)
Routine maintenance	10	(33)
Cleaning	3	(10)
Investigating a fault	2	(7)

32. The proportion of workplace fatalities associated with a maintenance activity in Victoria is consistent with that reported by EASHW. The estimated 30% of fatalities in the manufacturing industry due to MRISC[18] tasks identified by WorkSafe Victoria may well reflect the greater use of fixed machinery in the manufacturing sector.

Machinery and equipment maintenance

33. Maintenance is a generic term used to describe a variety of tasks performed on machinery and equipment. Maintenance activities include inspection, replacement, upkeep, lubrication,

[18] That is, maintenance, repair, inspection, servicing and cleaning tasks.

testing, adjustment, cleaning, servicing, measurement, repair, replacement of parts and fault detection.[19]

34. While maintenance of machinery and equipment is essential, it is recognised as a high-risk activity for both maintenance personnel and bystanders. According to the European Agency for Safety and Health at Work (EASHW), maintenance operations are estimated to account for around 15-20% of all incidents and 10-15% of fatal incidents.[20]

WorkSafe

35. The risk of injury associated with the maintenance, repair, installation, servicing and cleaning of machinery and equipment (collectively referred to by WorkSafe as "MRISC tasks") has been recognised in Victoria by WorkSafe as a high-risk activity,[21] although prevention campaigns are still in their relative infancy.[22]

36. In 2006-07, WorkSafe estimated that almost one third of all Victorian workplace deaths occurred during the undertaking of MRISC tasks.[23]

37. Mr Jason Howard, Manager of Operations Strategy (Strategic Programs) at WorkSafe advised that MRISC activities involving machinery and equipment represent at least 25% to 30% of all fatalities and standard claims in the manufacturing industry each year alone. Trauma is sustained primarily from uncontrolled exposure to:

    a. mechanical hazards (i.e. moving parts);

    b. non-mechanical hazards (i.e. emissions, pressure, noise, electricity); and

    c. access hazards.

38. Mr Howard further advised that the most common contributing factors included inappropriate planning, inappropriate supervision, inappropriate task improvisation, working alone and the use of contractors.

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[19] European Agency for Safety and Health at Work. (2010). *Maintenance.* Retrieved from: http://osha.europa.eu/en/topics/maintenance/

[20] See above.

[21] WorkSafe Victoria. (2010). *Maintenance and repair.* Retrieved from: http://www.worksafe.vic.gov.au/wps/wcm/connect/wsinternet/WorkSafe/Home/Safety+and+Prevention/Health+And+Safety+Topics/Plant/How+to+comply/Maintenance+and+repair/

[22] Email correspondence between CPU and Jason Howard, WorkSafe Victoria.

[23] See above.

39. To assist in illustrating the extent to which maintenance and non-production tasks contribute to serious and fatal workplace injury, in August 2010 Mr Howard provided a list of maintenance-related prosecutions in the past five years. A total of 54 prosecutions were identified, including 13 that involved fatalities.

Machinery crushing zone hazards

40. A review of Victorian workplace fatalities identified 18 deaths where the fatal injury was caused by an individual having entered a machinery crushing zone during operation. This represents 7% of all workplace deaths, and 11% of workplace deaths involving machinery or equipment. The type of machinery involved in the deaths is shown in Table 3.

41. This figure includes only those deaths where a person was exposed to a crushing hazard that was created through the movement of part(s) of the machinery during its normal operation. It does not include deaths involving general contact with machinery (such as being hit, struck, or entanglement). It excludes incidents such as being crushed in a vehicle rollover, or by an object falling from machinery.

42. Injuries inflicted from entering a crushing zone were predominantly associated with fixed machinery.

Table 3: Type of machinery causing crush zone hazard resulting in death

Machinery/equipment type	n	(%)
Fixed machinery	10	(56)
Industrial vehicle	4	(22)
Agricultural vehicle/machinery	1	(6)
Lifting device (crane)	1	(6)
Special construction vehicle	1	(6)
Transport vehicle (stationary)	1	(6)
Total	**18**	**(100)**

Safe Work Australia

43. Of 151 worker fatalities notified to Occupational Health & Safety authorities nationally in 2008-09, 10% (n=15) were the result of being trapped either by moving machinery or between a stationary and moving object[24] (Table 4).

44. This proportion is consistent with Victorian coronial data, which indicated that machinery crushing zones were implicated in 9% of total Victorian fatalities.

Table 4: Number of notified worker fatalities by mechanism and breakdown agency, 2008–09

	Breakdown agency of fatality						
Mechanism of fatality	**Mobile plant & transport**	**Machinery & fixed plant**	**Environmental agencies**	**Non-powered hand tools, appliances & equipment**	**Powered equipment, tools & appliances**	**Other agency or agency not stated**	**All agencies**
Vehicle incidents[25]	40	0	3	0	0	2	45
Being hit by moving objects	16	6	0	4	3	0	29
Falls from a height	4	0	9	5	0	2	20
Being hit by falling objects	2	4	2	3	0	4	15
Being trapped between stationary & moving objects	4	4	0	0	0	0	8
Drowning/immersion	5	0	2	0	0	1	8
Being trapped by moving machinery	2	5	0	0	0	0	7
Contact with electricity	0	6	0	0	1	0	7
Other mechanism of fatality	0	1	3	1	1	6	12
All mechanisms	73	26	19	13	5	15	151

[24] Safe Work Australia. (2009) *Notified Fatalities Statistical Report 2008-09.*

[25] Includes rollovers of mobile mechanical equipment such as tractors, forklifts and construction vehicles.

Would an emergency stopping device have altered the outcome?

45. It is difficult to speculate whether the fatal outcome may have changed, had an emergency stop button been available. For example, it is unknown how far the broom mechanism may have travelled before contacting with Mr Scale. If the broom mechanism moved quickly as described, and did not travel far, Mr Scale may not have had sufficient time to activate an emergency stop button once realising he was at risk of being crushed. Although it would have ceased movement immediately, the broom mechanism would not slacken and relieve the crushing force. Hence, the risk of asphyxia may still exist.

Directions Hearings

46. A Directions Hearing (DH) was conducted on by Coroner Olle in my absence on 3 February 2010. Coroner Olle requested all parties prepare written submissions in relation to why an Inquest should or should not be held in this matter.

Submissions

47. VicRoads submitted that the WorkSafe and Victoria Police investigation were comprehensive and accordingly an Inquest would not reasonably add anything further. WorkSafe did not express a view as to whether an Inquest into the death of Mr Scale should be held.

48. Counsel acting on behalf of Akron submitted that an Inquest was not necessary and that the matter is analogous to that of *Kirk v Industrial Relations Commission of NSW & Anor* [2010] HCA 1, which discussed the circumstances where it was not the employer's act or omission that caused the harm to a worker who was found to have ignored safety considerations whilst working alone. The full bench of the High Court of Australia found that the duty of care owed by an employer cannot be absolute and Heydon J noted the actions of the worker in that instance were "inexplicably reckless". Counsel acting on behalf of Akron submitted on this basis that Mr Scale's unfortunate death was due to his own inadvertence and echoed Mr Pezzimenti's opinion that his actions were unforeseeable.

49. Counsel acting on behalf of Akron submitted that an Inquest was not necessary on the following bases:

    a. Akron as the principal contractor to VicRoads on the Bass Highway duplication project inducted Mr Scale on 8 October 2007 and 12 November 2007. A site-specific induction and OHS policies were provided to Mr Scale and signed by him on 2

February 2008. Site-specific Safe Operating Work Instructions (SOWIs) were shown and explained to Mr Scale, who acknowledged by signature that he had read them. The SOWIs were kept onsite in the communal crib room. Regular site toolbox meetings were held along with an ongoing requirement to report site hazards;

b. Mr Scale had used the relevant Hino truck for some months on the Bass Highway duplication project and on other projects for Primal. It is understood that he was proficient in the use of the sweeper on the basis of the length of time with which he used the vehicle, and his previous employment with VicRoads;

c. a Job Safety Analysis had been conducted by Primal for the Bass Highway Duplication project (Grantville to King Road), version dated 1 August 2006 (provided to Mr Ronald Murphy, Senior WorkSafe Investigator);

d. Akron identified various relevant documents, including their Safe Operating Work Instructions, Controlled Copy number 29, issued to Project A6487 Bass Highway Duplication and Akron Occupational Health & Safety Plan, Akron Contract A6487 Bass Highway Duplication – Controlled copy number 2 dated 23 May 2007 and marked 'site copy';

e. Mr Scale, as part of his on-site duties, was required to sign a Daily Safety Plant Check. Akron submitted that Mr Scale had never completed the section that required him to advise if the plant was safe or unsafe, despite being required to do so. I note however, on this point that Mr Scale's son, Mr Steven Scale stated that he used to observe his father completing all of the required checks and tick off the checklist. Steven would assist his father in completing the daily required checks. I also note Primal's Daily Safety Plant Checks dated 12 November 2007 appear to have been completed by Mr Scale;[26]

f. Mr Steven Scale said that sometimes the sweeper hosting would not stop fully centred to its resting position. It would apparently take a couple of turns at the control unit to have the sweeper return to its normal position. Akron submitted that there appears to have been no complaint to Primal or notation of this problem, especially in the Daily Safety Sheets Mr Scale was required to complete. This is again in contrast with the evidence of Primal's Daily Safety Plant Checks dated 12

[26] Inquest brief, page 244.

November 2007 that appears to have been completed by Mr Scale, and notes "broom no side shift or up and down;[27] and

g. Mr Steven Scale observed his father on occasion between the broom mechanism and the rear of the truck to grease bracket holdings at the superior aspect of the broom mechanism, however this was done when the truck's engine was turned off. To grease the bracket holdings, a narrow spanner and a grease gun were required. This equipment was carried in the metal equipment cabinet on the left hand side of the truck, behind the cabin. Steven Scale had observed his father do this job on a number of occasions, as had Steven Scale himself. However, Steven Scale's statement is silent on the issue of why they performed the job in this manner given the crush warnings on the rear of the truck, or why it was necessary to grease the brackets in the first place. On the evidence available before me, I am unable to state whether Mr Scale was attempting to grease the bracket holding prior to the incident.

50. Counsel acting on behalf of Mr Scale's family initially submitted that an Inquest should be held to further explore the following issues:

a. there is no evidence that Mr Scale had been trained in what procedure to follow in the event of the broom mechanism malfunctioning;

b. the Primal safety protocols of Primal should address and provide clear guidance of how operators should respond to a failure in the broom stow mechanism;

c. the safety protocols do not specify that once the broom-stow mechanism was activated; the proximity switches would continually check the location of the sweeper and reactivate once the switch located the sweeper. Due to the absence of this information in the safety protocols, Mr Scale probably did not know that an adjustment to the proximity switch after a failure of the stow mechanism could cause the broom to suddenly recommence its pre-programmed action;

d. the safety protocols do not specify that the broom can (or should) be stowed manually by the operator using the joystick in the event of a malfunction with the broom stow mechanism; and

[27] Inquest brief, page 244.

e. there was a strong incentive for Mr Scale to attempt to fix a problem associated with the broom stow mechanism by entering the crush zone at the rear of the truck while the machine was operating, given he was generally experienced and confident with the machine, working under time pressure,[28] he was working alone and in a remote area.

51. Counsel acting on behalf of Mr Scale's family submitted that I should consider the responsibility of Primal and/or MBE for Mr Scale's death, and in particular, critically assess the following:

a. the adequacy of the operating procedures, safety procedures and safety protocols implemented by Primal;

b. the adequacy of the training provided to Mr Scale in operating the road broom, and particularly, responding to failures within the broom stow mechanism; and

c. the failure of Primal and/or MBE to install and implement:

i. emergency stop buttons at the rear of the machine; and/or

ii. a maintenance mode to enable safe access to the crush point during operation of the machine.

52. Counsel acting on behalf of Mr Scale's family further submitted that I consider making Comments and Recommendations regarding the installation of emergency stop buttons into the crush zone in machines of this type and amendment of the safety protocols and operating procedures of Primal relating to the road broom to include specific guidance to operators faced with a failure or malfunction of the broom stow mechanism.

53. A letter dated 18 June 2010 received on behalf of Mr Scale's family advised that they no longer wished that the matter proceed to Inquest.

54. After receiving and reviewing the submissions, a subsequent DH was held on 23 June 2010 to confirm my decision not to hold an Inquest into this matter upon receipt of written submissions.

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[28] I note that no evidence of these time pressures was provided.

COMMENTS

Pursuant to Section 67(3) of the **Coroners Act 2008**, I make the following comment connected with the death:

The only Risk Assessment provided by Primal in relation to the Hino truck was prepared in 2003, prior to the manufacture and installation of the broom mechanism in 2006. This represents an apparent failure by Primal to engage in a very basic risk minimisation strategy. It appears that a Risk Assessment was subsequently conducted and referred to as 'Matthews Brothers Engineering Pty Ltd Risk Assessment – Flindane Pty Ltd' dated 18 October 2008, as referred to in Mr Hodges' report.[29] I have not been provided with this document and cannot be satisfied that it is an appropriate remedial document aimed at preventing a similar death in the future.

During the course of the 23 June 2010 Directions Hearing, VicRoads explained that there were only two of the same type of machines in Victoria – one was that involved in Mr Scale's death, which has since been decommissioned (I was informed that it was not decommissioned based on any identified fault), and the other is being used by VicRoads.

In a letter dated 6 August 2010, VicRoads confirmed that although their vehicle uses a similar broom attachment, it differs from the mechanism involved in Mr Scale's death.[30] While this might make any particular Risk Assessment conducted by MBE/Flindane/Primal in relation to the Hino truck superfluous, the broader issues remain – looking generally at workplace fatalities involving this *type* of equipment, especially when those deaths occurred while a worker was working alone, and when consideration is given to the Occupational Health & Safety culture of the involved entities.

Mr Noel Matthews of MBE stated that Mr Scale was involved in the design and construction of the sweeping mechanism, however I agree with Mr Scale's family's submissions that this would be an overstatement of Mr Scale's expertise – he was a leading hand and plant operator, and it is doubtful he possessed expert or technical knowledge of the systems involved in the broom stow and

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[29] Inquest Brief, page 210.

[30] VicRoads informed that unlike Primal's model where the 'packing up' process is an automated computer controlled system (i.e. once the pack-up button is pressed, the broom automatically repositions itself to the travel position via a four-step process), the VicRoads' model can **only** be packed up by the operator using a joystick from the truck cabin position. Once the joystick is released by the operator, movement/repositioning of the broom stops immediately. This means that the risk of being crushed in between the broom attachment and the trailer while working alone has been eliminated.

sweeping mechanism sufficient to inform himself of safe operating procedures in the event of a malfunction.

The circumstances surrounding Mr Scale's death illustrate the inherent risks associated with both working alone, undertaking maintenance tasks on machinery (including inspecting a fault), and exposure to machinery crushing hazards. His death is not an isolated event.

Undertaking a maintenance task was associated with 19% of all workplace deaths where machinery/equipment was in use at the time of incident. In 11% of incidents where machinery or equipment was in use, a person was fatally injured after entering a crush zone.

The review of Victorian workplace fatalities investigated by the Coroner from 1 July 2000 to 30 June 2010 revealed that 31% of all workplace deaths concerned a person working alone at the time of incident. More than half of these persons were operating machinery or equipment at the time.

I note WorkSafe's publication entitled *Working Alone*, dated May 2011[31] that contains a risk assessment checklist. While this is a helpful general tool, it is still incumbent upon individual employers to identify the risks specific to their work environment, and attempt to reduce the identified risks of harm, as far as it is reasonably practicable to do so.

Mr Scale entered a crush zone while the vehicle was running, despite operating procedures to the contrary. Administrative controls, such as training and safe work instructions, are considered one of the *least effective* forms of risk control since they rely upon an individual to comply, as well as adequate training and regular auditing on behalf of the employer. Any competent, diligent worker may incidentally deviate from set operating procedures, particularly where a fault may arise with machinery or equipment. No person is immune from errors in judgement.

Importantly, things may go wrong when machinery or equipment is in use and it is often these circumstances that pose the greatest risk for injury, particularly where operating procedures may not exist.[32] The absence of a risk assessment conducted following the installation of the broom mechanism appear to have placed Mr Scale in an unacceptable position in the event that the mechanism failed, a situation, which contrary to the opinion of Mr Pezzimenti I am satisfied was foreseeable. While I appreciate that warning signs had been placed on the machinery and that all documents in existence relating to the broom mechanisms warned of the crush zone, I am not

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[31] Available at http://www.worksafe.vic.gov.au/forms-and-publications/forms-and-publications/working-alone accessed on 29 May 2014.

[32] See for example, previous findings into the death of Noel Robinson (case COR 2000 4001) and Gary Holloway (case COR 2002 3678).

satisfied that these were effective controls, particularly considering that Mr Scale was working alone. In reaching this position, I am influenced by Mr Steven Scale, who performed similar duties to his father, does not recall receiving written or verbal instructions in relation to operating the broom mechanism.

Machines commonly break down or malfunction, with or without warning. Mr Scale's 12 November 2007 notation in Primal's Daily Safety Plant Checks of "broom no side shift or up and down"[33] suggests there might have been a warning. I have not been provided with evidence regarding whether this notation was actioned in any way, whether there was a culture within Primal to review the Daily Safety Plan Checks, or whether they were simply something that needed to be checked off rather than completed in a meaningful way.

Mr Scale's death serves to illustrate the critical importance of having systems in place to avoid circumstances where persons work alone, to ensure risk assessments take into account tasks outside normal machine operation, and for risk control measures to not rely solely on administrative controls.

RECOMMENDATIONS

Pursuant to Section 72(2) of the **Coroners Act 2008**, I make the following recommendation connected with the death:

While I agree in theory with the suggestions made by Mr Phillip Hodges to install four failsafe emergency stop buttons at the rear of the vehicle in reach of a person facing rearward or forward to isolate any movement of the sweeper from mechanism in the event a person entered the restricted area, making this recommendation in relation to a decommissioned vehicle is unnecessary.

It is similarly unnecessary to make a recommendation to VicRoads regarding their similar vehicle still in use, as this vehicle's broom mechanism operates in a different way that already seems to remove the identified risk of crush injury.

I **recommend** however that in the event of Matthews Brothers Engineering Pty Ltd installing a broom mechanism to another vehicle in the future, that due consideration is given to the circumstances of Mr Scale's incident, and the identified risks are addressed so far as is reasonably practicable to avoid a similar incident from occurring.

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[33] Inquest brief, page 244.

FINDINGS

I accept and adopt the cause of death as ascribed by Dr Melissa Baker and find that Mr David Bruce Scale died from a ruptured liver and chest injuries due to blunt force trauma.

AND I find that Mr Scale died as a result of entering a crush zone when he was aware that it was dangerous to do so. I accordingly find that Mr Scale's death was preventable.

I direct that the Findings be published on the internet.

I direct that a copy of this finding be provided to the following:

- Simon Guthrie, Ryan Carlisle Thomas, on behalf of Mrs Gillian Scale
- Ms Louise Close, Enforcement Group, WorkSafe Victoria
- Steve Jacobs, Wisewoulds Lawyers, on behalf of Allianz Australia Workers Compensation
- Ms Rachel Walsh, DLA Piper (formerly DLA Phillips Fox) on behalf of VicRoads
- Ms Rachel Storey, Norton Rose, on behalf of Akron Roads Pty Ltd
- Ms Marissa Dreher, Freehills, on behalf of Primal Surfacing Pty Ltd
- Mr Noel Matthews, Matthews Brothers Engineering Pty Ltd
- Detective Senior Constable R Scully

Signature:

AUDREY JAMIESON
Coroner
Date: 4 June 2014