IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2012 005493

FINDING INTO DEATH WITHOUT INQUEST

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

I, PARESA ANTONIADIS SPANOS, Coroner,
having investigated the death of KARL HARRISON
without holding an inquest:
find that the identity of the deceased was KARL HARRISON
born on 9 June 1943
and that the death occurred on 25 December 2012
at the Box Hill Hospital, Nelson Road, Box Hill, Victoria 3128

from:

I (a) HYPOXIC ISCHAEMIC CEREBRAL INJURY

I (b) RESPIRATORY ARREST IN THE SETTING OF CHEMICAL FUMES.

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

1. Mr Harrison was a 69-year-old man who lived in Wheelers Hill with his wife, Chau (Polly) Harrison. He had two adult daughters from previous marriages, Jodie Stephens and Cassandra Harrison.

2. Mr Harrison first worked as a financial controller and manager after he completed a commerce degree, and then began working for a chemical company called ChemLab after he was made redundant in 1983. Mr Harrison developed a talent for inventing chemical products, and invented a deodoriser that was sold commercially to the abattoir and meat industries. He also invented a detergent called Slate Clean, and a water-based concrete and slate sealant called Aqua Glaze, both of which were made commercially available. Mr Harrison left ChemLab in 1987 and began working for another organisation in 1987, where he developed a surface coating

product for slate flooring. In 1988 he left this organisation and established his own business called KH Slate Coatings.

3. Mr Harrison specialised in sealing slate floors using two products he had created. He would make these products himself using raw materials, and kept a supply at his home.

4. In March 2004, Mr Harrison suffered a serious and life-threatening incident when working alone at a home in Belgrave. He was overcome by fumes whilst using a chemical to strip a slate-tiled floor of its polyurethane sealant, and lost consciousness. CPR was administered and he was transported to The Alfred Hospital where he was treated and, in due course, recovered.

5. After this incident, Mr Harrison reportedly began to wear masks and protective clothing when using this chemical, and bought fans to assist with ventilation. According to Jodie Stephens, her father did not complete any formal documented job safety or risk analyses. Mr Harrison would regularly transport dangerous chemicals in the back of his car, and Polly Harrison states that she could not travel in the car without having to open a window, as the chemical fumes were very strong.

6. On 18 December 2012, Mr Harrison left home to perform a job at a house in Camberwell. The house was owned by Ms Lan Vo and her husband, who stated that at around Easter time in 2012, their basement had become flooded during a storm. The water caused damaged to the polished slate floor surface, which was claimed through their insurance company, Guild.

7. The insurer engaged JP Flynn Builders to inspect and provide a quote for the repairs. JP Flynn in turn sought a quote from Mr Harrison to remove and replace the floor sealant. Mr Sean O'Sullivan, a supervisor and estimator from JP Flynn, inspected the home and stated that the organisation deferred to Mr Harrison's expertise regarding floor stripping and resurfacing. Mr Harrison first began working for JP Flynn in around March 2012, and had completed about 10 jobs for them.

8. When Mr Harrison attended Ms Vo's home on 18 December 2012, he checked the existing floor coating as he had initially thought it to be a water-based sealant, but discovered that it was polyurethane-based. Mr Harrison advised Ms Vo that he needed to return the next day with the correct stripping product.

9. On 19 December 2012 at about 8.30am, Mr Harrison recommenced work in the basement of Ms Vo's home. He was using a commercially available paint-stripping product called NuStrip, which contains the chemical solvent dichloromethane, or methylene chloride.

10. Ms Vo was home with her two young children at the time, and was 36 weeks pregnant. At about 10.00am, she spoke to Mr Harrison and checked that he was okay, as he was working alone. She

noticed an electric fan on the basement steps and facing up the stairwell, and observed Mr Harrison to be wearing a mask, with no oxygen cylinder. Ms Vo also noticed a strong chemical smell. The basement did not have any windows, vents or doors other than the doorway through to the lounge room.

11. About half an hour later, Ms Vo returned to the basement and found Mr Harrison lying on the floor. He was unconscious, his breathing was shallow and she noticed a strong smell of chemical fumes. Mr Harrison was not wearing a mask and the fan was unplugged. Ms Vo was not wearing shoes and was concerned about entering the basement as she was pregnant, so she ran upstairs and called 000. Ms Vo was advised that she and the children should leave the home immediately and await the attendance of emergency services.

12. Ms Vo and her family were unable to return to their home for several days, as chemical vapour tests showed that the level of chemical vapours were at an unsafe level.

13. Metropolitan Fire Brigade (MFB) officers arrived and were unable to enter the basement without breathing apparatus. They removed Mr Harrison from the basement and paramedics had arrived at that time and assisted to perform first aid. Mr Harrison's condition was stabilised and sinus rhythm was returned, and he was transported to the Box Hill Hospital.

14. Mr Harrison's condition continued to decline in hospital, and blood tests revealed elevated levels of carboxyhaemoglobin. A chest x-ray showed bilateral infiltrates. There was no change in Mr Harrison's neurological state and clinicians discussed his poor prognosis with his family. It was determined that Mr Harrison should be extubated and treated palliatively. He passed away at about 3.00am on 25 December 2012.

15. An autopsy of Mr Harrison's body was performed by Forensic Pathologist Dr Yeliena Baber, from the Victorian Institute of Forensic Medicine (VIFM), who reviewed the circumstances as reported by the police to the coroner and post mortem CT scanning (PMCT) of the whole body, and provided a detailed written report of her findings. Dr Baber attributed Mr Harrison's death to *hypoxic ischaemic cerebral injury* secondary to *respiratory arrest in the setting of chemical fumes*.

16. Dr Baber advised that autopsy findings included granulating burns on the thoracic region of the back, narrowing of the left anterior descending coronary artery, florid pulmonary oedema and granular renal cortices, with no evidence of acute myocardial infarction. Dr Baber identified no significant natural disease present that would have caused the initial respiratory arrest.

17. Toxicological analysis of post-mortem blood did not reveal volatile compounds, but did reveal traces of paracetamol, free morphine at ~0.06mg/L, midazolam at ~0.01mg/L, 7-

aminoclonazepam at ~0.2mg/L and levetiracetam at ~7mg/L, consistent with therapeutic administration. No ethanol (alcohol) or other common drugs or poisons were found. Dr Baber further advised that although volatile compounds were not detected post-mortem, this did not exclude the fact that chemical fumes are likely to have caused Mr Harrison's initial arrest.

18. The circumstances surrounding Mr Harrison's death were also investigated by WorkSafe. After considering all the evidence, WorkSafe advised the Court that there was insufficient evidence to support a reasonable prospect of conviction in relation to any party for breaches of the *Occupational Health and Safety Act 2004* (Vic) (OHS Act).

19. WorkSafe provided the Court with an expert report from Scientific Advisor Dr Nicholas Perkins regarding the regarding the volatile compounds involved in Mr Harrison's death. Dr Perkins referred to tests conducted at Ms Vo's home, which detected the presence of high levels of methylene chloride at approximately three times the concentration deemed dangerous to life and health. Dr Perkins also carried out a test on a liquid sample obtained from a mop bucket that Mr Harrison was using in the basement, which indicated that the main volatile component in the mixture was methylene chloride with low levels of xylenes. Dr Perkins advised that these are the main volatile components of paint stripper.

20. Safe Work Australia[1] has a model Code of Practice for working in confined spaces; however, it appears that a basement would not be considered a confined space for the purpose of the *Work Health and Safety Regulations 2011* (Cth).

21. WorkSafe advised that the relevant regulations in Victoria are Part 4.1 (Hazardous Substances) of the Occupational Health and Safety Regulations 2007. NuStrip is defined as a hazardous substance because its main ingredient is listed in the Hazardous Substances Information System (HSIS) maintained by Safe Work Australia, and is present in a concentration that equals or exceeds one per cent, the concentration cut-off specified in the HSIS.

22. Suppliers of dichloromethane are required to act in accordance with section 30 of the OHS Act, ensuring safety, and providing adequate information regarding its use and conditions necessary to ensure that the substance is safe. The evidence before me indicates that the OHS Act requirements were met in the supply of NuStrip to Mr Harrison.

23. I asked the Coroners Prevention Unit (CPU)[2] to provide advice regarding this matter, particularly regarding any prevention opportunities, or any previous comments or recommendations made by coroners investigating similar fatalities.

[1] Safe Work Australia is an independent Commonwealth statutory agency that leads policy development and aims to improve occupational health and safety and workers' compensation arrangements in Australia.

24. The CPU advised that exposure to the main solvent in NuStrip (used in paint removers, as an aerosol propellant and as an extractant) can lead to death and is suspected of being a human carcinogen. The CPU referred to the statement of Mr Dennis Macdonald, the technical services manager of Nutech Paints, who advised that NuStrip is intended primarily for outdoor use only, and in well-ventilated areas. Mr Macdonald stated that Mr Harrison should have been aware of the dangers of using the product in a confined and poorly ventilated area, as he had purchased it on several previous occasions. The product also contained clear warning labels.

25. The CPU reviewed previous Victorian fatalities from 1 July 2000 to 31 March 2014 where a person had died after being overcome by toxic chemical vapours in the course of both paid work and 'do-it-yourself' activities. The search was not limited to collapses caused by paint strippers, but included any toxic chemical vapours.[3]

26. The CPU was able to identify four closed investigations in the relevant period where persons were overcome by chemical vapours. A further open investigation was also identified. Three of the fatalities involved the chemical solvent dichloromethane, one involved propane and the circumstances surrounding the open investigation were yet to be determined at the time of CPU's research.

27. The CPU found that the United States of America Occupational Safety and Health Administration (OSHA) agency reported deaths of at least 13 workers who were refinishing bathtubs, using the paint stripper dichloromethane whilst working. The OSHA investigation determined that in the majority of fatalities the workers were alone, rooms were poorly ventilated, workers did not use adequate respiratory protection and had little or no training about the hazards of dichloromethane use.

28. The CPU further noted that in 2009, the European Parliament proposed a ban of the use of dichloromethane in paint strippers, and elected to gradually phase out use of the chemical from June 2012. The ban is now in effect across the European Union.

29. I find that Mr Harrison's death was accidental, and that the cause of his death is hypoxic ischaemic cerebral injury secondary to respiratory arrest in the setting of chemical fumes.

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[2] The CPU is a specialist service comprising a team of investigators and health clinicians. The CPU assists coroners fulfil their prevention role and contribute to a reduction in preventable deaths.

[3] The CPU advised that it could not exclusively identify all relevant incidents in the date, as the search relied on relevant keywords being present in the searched coronial documents.

COMMENTS

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

1. This case serves as a tragic reminder of the serious hazardous nature of dichloromethane and the need for stringent work practices. I note the similarities between the circumstances of Mr Harrison's death and those identified above by OSHA in the United States, and that the European Union has already banned use of dichloromethane in paint stripping products.
2. It is evident that Mr Harrison had some expertise in using dichloromethane and other substances involved in repairing slate flooring, and that supervision by the head contractor, JP Flynn, was minimal in light of this expertise. I understand that JP Flynn treated Mr Harrison as an expert of sorts and, aside from conducting its usual risk assessment and safety procedures, the organisation expected him to understand and take the necessary safety precautions. Further, Mr Harrison had been overcome by fumes on a previous occasion and was therefore highly aware of the dangers of working with these substances.

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

Mrs Polly Harrison
Ms Cassandra Harrison
Dr Yvette Kozielski, Medico-Legal Officer, Eastern Health
Mr Russell Ames, Senior Investigator, WorkSafe Enforcement Group
The Hon Gordon Rich-Phillips MP, Assistant Treasurer
Mr Rex Hoy, Chief Executive Officer, Safe Work Australia
Mr Paul O'Connor, Chief Executive Officer, Comcare
Senator Eric Abetz, Minister for Employment
Mr Jim Higgins, Chief Executive Officer, Metropolitan Fire Brigade
Senior Constable Caroline Sorrell, Boroondara Police Station.

Signature:

PARESA ANTONIADIS SPANOS
CORONER
Date**: 19 June 2014**

cc: Manager, Coroners Prevention Unit