QUEENSLAND COURTS

OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION:	**Inquest into the death of Kingsley Rex Wade**
TITLE OF COURT:	Coroner's Court
JURISDICTION:	Cairns
FILE NO(s):	2011/3690
DELIVERED ON:	23 October 2015
DELIVERED AT:	Cairns
HEARING DATE(s):	16 December 2014, 24 & 25 March, 26 June 2015
FINDINGS OF:	AJ Comans, Coroner
CATCHWORDS:	CORONERS: Inquest – sandblasting, diesel air compressor, breathing air being contaminated by carbon monoxide

REPRESENTATION:

Counsel Assisting:	Ms Stephanie Williams
Fair and Safe Work Queensland:	Mr KA Parrott i/b Crown Law
Family of Mr Wade:	Mr JM Harper i/b Sciaccas Lawyers
Steelcon Cava Pty Ltd:	Mr AD Scott i/b Worcester and Co Solicitors

Kingsley Rex Wade was employed by Steelcon Cava Pty Ltd in Mount Isa as a painter and to do sand blasting as required as he had some experience in that field of work.

On 27 October 2011, Mr Wade was instructed by his supervisor to undertake some sandblasting of a piece of machinery to ready it for painting.

The method of sandblasting utilised by the employer at that time required Mr Wade to wear a fully enclosed protective helmet into which breathing air was provided via a hose from an air compressor.

The air compressor was powered by a diesel internal combustion engine.

The compressor not only supplied breathing air to Mr Wade's helmet but also the compressed air for sandblasting.

On 27 October 2011 at about 9.30am, Mr Wade had some "smoko" with co-workers and returned to the task of sandblasting the piece of machinery in an area away from the other workers and on his own.

At about 1.00pm, Mr Wade was found by a co-worker collapsed on the ground at the site where he had been sandblasting with the helmet still on his head and the compressor stopped.

Emergency resuscitation efforts were undertaken but to no avail.

Mr Wade was pronounced deceased by a paramedic at 2.03pm.

The cause of Mr Wade's death was determined after an autopsy to be carbon monoxide toxicity against a background of coronary artery atheroma.

An Inquest was requested by Mr Wade's next of kin and was held at Mount Isa on 24 and 25 March 2015 and at Brisbane on 26 June 2015.

Evidence was taken from an officer from Fair and Safe Work Queensland who conducted an investigation under the *Workplace Health and Safety Act 1995*.

Various employees of Steelcon Cava Pty Ltd also gave evidence including the co-worker who found Mr Wade collapsed at his work site, Mr Wade's supervisors and tradesmen involved in maintenance and repair of the employer's plant and equipment including the diesel air compressor Mr Wade was using on the date of his death.

Evidence was also taken from persons involved in the management of Steelcon Cava Pty Ltd, including the company's owner.

Expert evidence was given by Mr Lund and Dr Grantham.

The Court was assisted by Counsel and the following parties appeared and took part in the Inquest represented by Counsel:

Fair and Safe Work Queensland
Mr Wade's next of kin Mrs Vicki Wade
Steelcon Cava Pty Ltd

The evidence from the witnesses unfolded fairly un-controversially and I do not propose to traverse the evidence in detail in these findings.

Controversy does arise with respect to what conclusions may be reached upon a consideration of all the evidence.

Findings of fact

I make the following findings of fact based on the evidence:

The diesel air compressor used by Mr Wade on 27 October 2011 was not one that was hired out by Steelcon Cava Pty Ltd. for use on mining sites.

There were no records of start-up procedures or regular maintenance maintained for this compressor.

The only work done by employees of Steelcon Cava Pty Ltd on the compressor was repairs in response to breakdown rather than regular maintenance.

There was no risk assessment done independently of Mr Wade (e.g. by his supervisor) for the task of sandblasting that he was undertaking on 27 October 2011 or for sandblasting in general.

The breathing air coming from the diesel air compressor to Mr Wade's helmet on 27 October 2011 was contaminated by carbon monoxide; the source of that carbon monoxide was the diesel air compressor; there was no other source of carbon monoxide present capable of contributing to that contamination; inhalation of the carbon monoxide was the direct cause of Mr Wade's death.

None of the witnesses from Steelcon Cava Pty Ltd (management or workers) had any appreciation of the risk of carbon monoxide contamination of breathing air from diesel air compressors operated in the circumstances existing on 27 October 2011.

Discussion

The issue for the Court now is to consider how the breathing air from the diesel air compressor became contaminated by carbon monoxide.

As part of the Fair Work Queensland investigation, an inspection of the diesel air compressor was carried out by Mr Lund who produced a report on that inspection dated 3 April 2012.

That inspection revealed (at the time of the inspection) a broken oil separator scavenger pipe in the diesel air compressor, the high temperature protection switch was disconnected and a minor leak from the engine's exhaust system.

Also revealed by that inspection was evidence of oil flashing across the separator element, i.e. oil burning at high temperature within the diesel air compressor.

In his report dated 3 April 2012 (relating to his inspection of the compressor on 28 and 29 February 2012), Mr Lund concluded that operating the diesel air compressor with the broken oil separator scavenger pipe would led to "excessive oil carryover which would have caused a low compressor oil level. The low compressor oil level would have caused high compressor discharge temperature and with the compressor high temperature protection switch disconnected, the compressor discharge temperature would have been increasing until it reached the flash point temperature at this separator element."

Dr Grantham reached the conclusion (at paragraph 11 of his report dated 2 April 2011) that operating the compressor with these defects "was ideal for commencement of oil combustion and creation of carbon monoxide."

With the high temperature protection switch disconnected, the diesel air compressor would continue to operate and continue to overheat producing more carbon monoxide as the oil burnt at the high temperature.

Due to the circumstances of the investigation by Fair and Safe Work Queensland, the defects of the broken oil separator scavenger pipe and disconnected high temperature protection switch were not discovered for some months after 27 October 2011.

In the mean-time, the diesel air compressor had been subject to a fence falling on it during a violent storm (albeit when the compressor was closed up and not operating), to being transported within Mount Isa, then to Townsville for storage, then to Mr Lund's workshop for the inspection.

At this point, I do find that the combination of broken oil separator scavenger pipe, the disconnected high temperature protection switch and the minor exhaust leak would cause contamination of the breathing air supply by carbon monoxide from this diesel air compressor if operated as it was on 27 October 2011.

The question now is, was it that combination of circumstances or some unknown combination of circumstances or some unknown malfunction of the diesel air compressor that caused the contamination of Mr Wade's breathing air on 27 October 2011.

I find it highly unlikely the fence falling on the closed up compressor would have caused any of these known defects of the compressor.

I also find it highly unlikely that damage to the oil separator scavenger pipe (an internal part of the compressor) would occur during transportation when there is no evidence of any other damage (externally or internally) to the machine.

It is possible that the wire to the high temperature protection switch could become dislodged during transport, perhaps through vibration or inadvertently by someone handling the machine.

However, overall, I find that in the circumstances of the breathing air being contaminated by carbon monoxide on 27 October 2011 and there being no other defects or circumstances discovered that could lead to such a contamination, it is more probable than not that the combination of defects, being the broken oil separator scavenger pipe and the disconnected high temperature protection switch did exist at the time Mr Wade was operating the compressor on 27 October 2011 and did cause the production of excessive carbon monoxide which contaminated Mr Wade's breathing air supply.

It is however not possible to find when prior to 27 October 2011 those defects occurred to the diesel air compressor as it was not subject to regular maintenance as it would have been if it had been regularly hired to mining sites and there are no records of any start up checks being conducted at any time.

Accordingly, pursuant to s.45 (2) *Coroners Act 2003*, I find as follows:

Identity of the deceased:	Kingsley Rex Wade
How the person died:	Kingsley Rex Wade died when the breathing air supply from the diesel air compressor to the enclosed helmet he was wearing became contaminated by excessive carbon monoxide. The excessive carbon monoxide was produced within the diesel air compressor when the oil in the separator element of the diesel air compressor began to overheat due to an oil scavenger pipe within the diesel air compressor being broken causing low oil level. The diesel air compressor continued to operate whilst overheated due to the high temperature cut out switch being disconnected and the remaining oil burnt at high temperature.
Date of death:	27 October 2011
Place of death:	4 Northbridge Road, Mount Isa
Cause of death:	Carbon monoxide toxicity against a background of coronary artery atheroma

Comments

Pursuant to s. 46 *Coroners Act 2003*, a Coroner may, whenever appropriate, comment on anything connected with a death investigated at an inquest that relates to – (a) public health or safety; or (b) the administration of justice; or (c) ways to prevent deaths happening in similar circumstances in the future.

When compressors powered by internal combustion engines are used to provide breathing air to persons there is an inherent risk of contamination of the breathing air by carbon monoxide because the engines produce carbon monoxide and carbon monoxide is produced when oil burns.

When such engines continue to operate when overheated, there is risk of the engine oil burning and producing excessive amounts of carbon monoxide.

In the circumstances of Mr Wade's death there were two measures that would have probably prevented his death.

Firstly, providing a device that was referred to during the inquest and in the submissions by Counsel for Steelcon Cava Pty Ltd that monitors carbon monoxide in the breathing air and gives off an alarm when the carbon monoxide level is too high in the breathing air.

That measure, which is effectively a last line of defence for workers in Mr Wade's situation is now part of a code of practice for industry, but was not a requirement as at the date of Mr Wade's death.

Secondly, a high temperature protection cut out switch, properly connected to the engine and designed to stop the engine before the engine oil starts to burn.

There was evidence that these switches can function in two ways: one where, if the switch is disconnected, the engine will still start and continue to operate (as in this case) and the other, where if the switch is disconnected, the engine will not start.

The first option is not fail safe and its effectiveness depends of variables such as appropriate maintenance, regular inspection and care in operating the machine.

Clearly the latter option would be the safest way to deal with the risk of internal combustion engines in air compressors overheating and producing excessive carbon monoxide.

Accordingly it is recommended that a requirement be included in the appropriate codes of practice that when air compressors driven by internal combustion engines are used to provide breathing air to persons, that the high temperature protection cut out switch be of the type that if disconnected or not functioning, the engine will not start.

Reporting offences

Section 48 *Coroners Act 2003* is relevant to this matter.

The reason this Inquest was not started earlier was Steelcon Cava Pty Ltd was prosecuted by Fair and Safe Work Queensland for a breach of Section 28 *Workplace Health and Safety Act 1995*.

That prosecution failed in the Industrial Magistrates Court at Mount Isa.

Counsel for Steelcon Cava Pty Ltd referred in submissions here to details of that prosecution and the subsequent appeal by the prosecution to the Industrial Court of Queensland (Coggins v Steelcon Cava Pty Ltd [2014] ICQ 022) which also failed.

Section 48 is mandatory in its requirements for a Coroner to give information to the relevant government department when the Coroner, from information obtained while investigating a death, reasonably suspects a person has committed an offence.

For an offence to be made out under s. 28 *Workplace Health and Safety Act 1995*, there must be identified a "measure not taken" by Steelcon Cava Pty Ltd which would have prevented Mr Wade being exposed to the risk of breathing in excessive amounts of carbon monoxide.

In the context of this case, the "measure not taken" would be to perform regular maintenance on the compressor and enforce and record a start-up procedure as together or independently, those measures could have identified the broken oil scavenger separator pipe and the disconnected high temperature protection cut out switch.

Whilst it could not be determined in the findings at this Inquest when prior to 27 October 2011 the defects of broken oil scavenger separator pipe and the disconnected high temperature protection switch came about, the lack of regular maintenance and absence of any records, make it reasonable to suspect the defects had been there for some time.

Suspicion is more than speculation but less then certainty, and there may be other considerations or evidence favourable to or adverse to a prosecution being successful.

In this case, it may not be possible on the evidence adduced so far to prove beyond a reasonable doubt that the defects would have been discovered during regular maintenance or during start up checks.

But that is not the concern of this court. The concern of this Court is to alert the appropriate authorities to a reasonable suspicion of an offence being committed so that authority may investigate further if necessary and take appropriate action.

Consequently in accordance with s. 48 *Coroners Act 2003* the evidence adduced at this inquest is referred to Fair and Safe Work Queensland on the grounds it is reasonable to suspect that Steelcon Cava breached section 28 *Workplace Health and Safety Act 1995*.

A.J.Comans
CORONER

23 October 2015