



OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

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JURISDICTION: BRISBANE

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Introduction

Cameron “Bubba” Cole was 24 years of age when he died in an ambulance on the Injune-Taroom Road on 14 August 2009.

Mr Cole had been working for Lucas Mitchell Drilling (Lucas) as a member of a drilling crew attached to Rig 151. The crew were in the process of establishing a new well site at Fairview 272. This formed part of the Santos Gladstone Liquefied Natural Gas (GLNG) Gas Field Development Project.

During his morning break a truck towing a trailer with a mixed load of equipment and supplies arrived at the Fairview site. The load had been hauled that morning from the Yebna North 2 (Yebna) well site.

Included in the load were five very heavy steel pipe racks that were used for supporting drilling pipes. The pipe racks were triangular in shape. Three blue pipe racks owned by Santos were placed side by side along the bed of the trailer. Another two white racks owned by Lucas were inverted and placed in the gaps formed by the lower three racks. The blue pipe racks were each about 12m long and each weighed 725kg. The two white racks were about 8m long and weighed more than 500kg each.

Two chains held the lower three racks in place and a third chain held the upper two inverted pipe racks in place. The chains were secured by load binders. Stanchions were in place on the left hand side of the trailer but were not able to be fitted to the driver’s side.

The truck driver, Damon Springer, was standing beside the right hand side of the trailer with Mr Cole and Mr Lammas. Mr Springer released all three load binders while the top two racks were still in place. The downward weight of the top racks pushed the outside lower rack off the trailer. The top rack fell with it and one or both fell onto Mr Cole, crushing him and pinning him to the ground. Mr Cole suffered multiple injuries, including severe chest trauma. Despite the efforts of his fellow workers and ambulance paramedics he died while being transported to hospital.

These findings deal with the matters required by s. 45(2) of the *Coroners Act 2003*; namely the identity of the deceased, when, where and how he died and what caused his death. They also consider the following issues, which were identified prior to the inquest:

- The adequacy of the design of the vehicle used to transfer plant and equipment on 14 August 2009 and the procedures for loading, carriage, restraint and unloading of loads.
- The adequacy of safety management systems in place to manage the risks associated with the transfer of plant and equipment from well site Yebna North #2 to well site Fairview #272 on 14 August 2009, including the training of personnel.

- The adequacy of safety management systems now in place to manage the risks associated with the transfer of plant and equipment from well site to well site.
- The emergency response, including the availability of medical services at remote worksites.

The investigation

Investigations into Mr Cole's death were carried out by the Queensland Police Service and the Petroleum and Gas Inspectorate established under the *Petroleum and Gas (Production and Safety) Act 2004*.

The first response police officer was Senior Constable Warren Carpenter who was stationed at Injune in August 2009. Senior Constable Carpenter's evidence was that he received an emergency call on 14 August 2009 asking him to transport a Royal Flying Doctor Service (RFDS) medical team to the incident scene.

Senior Constable Carpenter travelled with the RFDS team, and approximately 35km from Injune on the Injune-Taroom Road, they met the ambulance that had attended at the incident scene. Senior Constable Carpenter then continued to Fairview where he conducted preliminary investigations.

After attending at the scene Senior Constable Carpenter made enquiries with officers from the Roma Criminal Investigation Branch (CIB) who elected not to attend. Senior Constable Carpenter secured the scene and subsequently released the site for further investigation by the Petroleum and Gas Inspectorate. Inspector John Wright from the Petroleum and Gas Inspectorate had advised him that, as the incident occurred on a gas site, the Inspectorate rather than Workplace Health and Safety would conduct the investigation.

Detective Sergeant Leon Reinke from the Roma CIB subsequently reviewed Senior Constable Carpenter's investigation. The Queensland Police Service took no further action in relation to the incident.

The Commissioner for Mine Safety initiated a prosecution in relation to Mr Cole's death under the *Petroleum and Gas (Production and Safety) Act 2004*. That prosecution was commenced before the Industrial Magistrates Court at Taroom, but was eventually discontinued in August 2012. Section 29 of the *Coroners Act* prevented the inquest from proceeding until those proceedings had finished.

Inspector John Wright, Regional Petroleum and Gas Inspector, Central Region, Department of Natural Resources and Mines prepared an investigation report in relation to the incident during 2010. Mr Wright gave evidence at the inquest. Mr Wright's report was the subject of significant criticism from those represented at the inquest. I have not endeavoured to make findings with respect to the points of contention with Mr Wright's report.

As I heard directly from those involved in the incident and from representatives of Lucas and Santos, and received a large amount of relevant material in the

form of exhibits, it has not been necessary for me to adopt the factual basis of Mr Wright's report or his conclusions.

I am satisfied that all relevant information has been put before the court and I thank each of the investigating agencies involved for their assistance.

The inquest

There were several pre-inquest conferences held in this matter. The first was held on 12 June 2014, the second was held on 28 July 2014 and a third was held on 1 October 2014. Mr Tate was appointed as counsel assisting, and leave to appear was granted to:

- Mr Cole's family;
- The AJ Lucas Group Ltd and Mr Brett Tredinnick;
- Santos Toga Pty Ltd;
- Mr Damon Springer;
- The Queensland Ambulance Service;
- Mr Justin Smith;
- Mr Tony Lammas;
- Mr Cameron Wright; and
- Mr Wayne Schefe and Mr Scott Hobday.

An inspection of a loading operation involving pipe racks being placed onto a trailer was conducted at a Santos facility in Roma on 23 September 2014. Plans had been put in place to visit a well site controlled by another company on that day but this was precluded by unsafe road conditions which followed rainfall in the area. I was also able to inspect the CareFlight aeromedical base at Roma on 23 September 2014.

An inquest was held over five days from 20 October 2014 to 24 October 2014. Evidence was heard from 22 witnesses and over 150 exhibits were tendered. Helpful written submissions were received in November 2014 from the represented parties following the conclusion of the evidence. Further oral submissions were made at another hearing on 28 November 2014.

All of the statements, records of interview, medical records, photographs, and materials gathered during the investigations were tendered at the inquest.

I am satisfied that all the material necessary to make the requisite findings was placed before me at the inquest and I thank those given leave to appear for their assistance.

Coronial jurisdiction

An inquest is a fact finding exercise and not a process for allocating blame. The procedure and rules of evidence used in criminal and civil trials are not adopted. "In an inquest there are no parties, there is no indictment, there is no prosecution, there is no defence, there is no trial, simply an attempt to establish

the facts. It is an inquisitorial process, a process of investigation quite unlike a trial.”¹

The purpose of an inquest is to inform the family and the public about how the death occurred and, in appropriate cases, to make recommendations with a view to reducing the likelihood of similar deaths. As a result, a coroner can make preventive recommendations concerning public health or safety, the administration of justice or ways to prevent deaths from happening in similar circumstances.

A coroner is prohibited from including in the findings or any comments or recommendations any statement that a person is, or may be, guilty of an offence or civilly liable.

The *Coroners Act* provides that if, from information obtained at an inquest or during the investigation, a coroner reasonably suspects a person has committed an offence, the coroner must give the information to the Director of Public Prosecutions in the case of an indictable offence and, in the case of any other offence, the relevant Department.

Understanding catastrophic Incidents

It would be possible to see the incident that resulted in Mr Cole’s death as being solely the consequence of momentary inattention on the part of Mr Springer and his colleagues when Mr Springer released the bindings that held the pipe racks in place.

However, a focus on identifying individuals to blame for the incident is not helpful when looking for ways to prevent similar deaths from happening. Human errors can occur in the best organisations with the most sophisticated systems, and it is important to consider the broader context in which errors occur in order to find ways to prevent incidents.

As the General Manager for Safety at Santos acknowledged at this inquest, there were a number of inherent weaknesses and lapses in the barriers within the safety system. Those weaknesses lined up on 14 August 2009 and resulted in the catastrophic event.²

The evidence

A large amount of information was contained in the exhibits and oral evidence. These reasons record only the evidence I believe is necessary to understand the findings I have made.

Personal history

Cameron Cole was born on 11 December 1994 and was only 24 years of age when he died. He had followed his father into the drilling industry. His father,

¹ *R v South London Coroner, ex parte Thompson* (1982), 126 S.J. 625

² Transcript, 4-27. This reflects the “Swiss Cheese Model” of Professor James Reason in his writings on accidents and system failures e.g. *Human Error*, Cambridge University Press 1990.

Graham, still works in the industry and provided valuable and practical insights at the inquest.

It is clear that Mr Cole was widely respected within his workplace and was regarded as a senior member of his crew. His death was felt not only by his crew but also across the petroleum and gas industry and contributed, among other things, to the establishment of a significantly enhanced emergency response capacity for workers and the community in Southwest Queensland.

During the weeks that Mr Cole was not working on the drilling rig, he lived with his family at Mt Whitestone in the Lockyer Valley. It is evident that Mr Cole was loved, respected and now very much missed by his family, friends and colleagues. I extend to them my sincere condolences.

The Rig move to Fairview 272

The Fairview 272 (Fairview) well site is located some 51 km east of Injune on Santos Toga's petroleum lease 100. This lease covers an area of 232 square kilometres. The Yebna well site was located on Santos Toga's petroleum lease 232.

Early on Friday, 14 August 2009 Mr Lammas, the night tool pusher employed by Lucas, drove to the previous well site at Yebna with truck driver, Damon Springer. They went to collect miscellaneous items of equipment that were left at Yebna and were to be moved to Fairview.

This type of load was commonly referred to as a "snot load" or "pus load". The load was not critical to the drilling operation, and the labels given to these loads seem to have influenced the attitude taken by those on Rig 151 to safety issues attaching to the loads.

Loading the pipe racks

Mr Springer was employed in the transport division of Lucas drilling. He possessed a certificate III qualification in transport and distribution. At the inquest he indicated that he was not familiar with the suite of safety documents associated with Rig 151, including the Rig Move Risk Assessment, Rig Move Plan and associated safe work instructions. He acknowledged that he had undertaken a course in the use of Take 5s.

Mr Springer was not a member of the drilling crew for Rig 151. He was not involved in drilling operations or the rigging up and rigging down process. His sole role was transportation. His evidence was that he was predominantly engaged in moving four or five Lucas rigs, and that he moved between two and three rigs each fortnight. At the time of Mr Cole's death he had been employed by Lucas for approximately 18 months, and had undertaken many rig moves during that time.

Mr Springer's evidence was that on 14 August 2009 he travelled to the old lease site to clean it up because his two trailers were located there. His heavy vehicle was comprised of a prime mover, a front trailer and a rear dog trailer.

Five pipe racks were included in the load. Mr Springer loaded these onto the front trailer with the assistance of a loader operated by Mr Lammas. The configuration entailed three blue pipe racks being placed alongside each other. The front trailer had a standard flat bed with a checker plate steel deck.

Mr Springer's evidence was that it was his intention to use four vertical bolsters or stanchions to hold the lower three pipe racks in place. Two stanchions were inserted on the left side of the trailer. However, after the first three pipe racks were placed onto the trailer there was insufficient space remaining for the driver's side stanchions to be installed. There was no other location on the truck for bolsters or stanchions to be inserted.

Schedule 7 to the *Heavy Vehicle (Mass, Dimension and Loading) National Regulation*³ now prescribes the requirements for securing loads to heavy vehicles:

- (1) A load on a heavy vehicle must not be placed in a way that makes the vehicle unstable or unsafe.*
- (2) A load on a heavy vehicle must be secured so it is unlikely to fall or be dislodged from the vehicle.*
- (3) An appropriate method must be used to restrain the load on a heavy vehicle.*

Section 115 of the *Heavy Vehicle National Law* provides that "evidence that a load on a heavy vehicle was not placed, secured or restrained in a way that met a performance standard stated in the *Load Restraint Guide* as in force at the time of the offence is evidence the load was not placed, secured or restrained in compliance with a loading requirement applying to the vehicle". In addition, evidence that a load, or part of a load, has fallen off a heavy vehicle is evidence that the load was not properly secured.

The Load Restraint Guide was published by the National Transport Commission in 2004 and was in force at the time of Mr Cole's death. It is currently being reviewed. With respect to restraining loads on vehicles, it provides at page 57:

- It is the responsibility of the owner, the driver and the person in charge of loading, to ensure that the vehicle's load restraint structure, attachments and load restraint equipment are suitable for the application and are serviceable and functional.*
- It is the responsibility of the person in charge of loading and the driver, to ensure that a load is properly restrained by the vehicle load restraint structure, attachments and load restraint equipment using safe operating procedures.*

³ At the time of Mr Cole's death similar requirements were imposed under the *Transport Operations (Road Use Management—Mass, Dimensions and Loading) Regulation 2005*

- *It is the responsibility of the person in charge of unloading and the driver, to ensure that load restraint equipment is released and removed using safe operating procedures and that the load is removed safely from the vehicle.*

As Mr Springer had intended to use stanchions on each side of the trailer, he did not consider that it was necessary to use dunnage underneath the pipe racks. In his view, dunnage's primary purpose was in creating a gap underneath a load to enable a forklift to access it. That was not necessary having regard to the lattice-like design of the pipe racks.

Mr Springer's understanding is not consistent with the Load Restraint Guide, which provides:

The required number and strength of tie-down lashings will depend on:

- *the weight of the load;*
- *the friction (grip) between all of the load surfaces; and*
- *the clamping force from the tie-down lashings.*

Tie-down lashings are most effective when there is high friction between the vehicle and load surfaces. Vehicle loading decks and loads should therefore be free of oil, grease, water, dirt and other contaminants that may reduce friction

Where a load has low friction between the surfaces in contact, the friction can be greatly increased by using appropriate inter-layer packing, e.g. rubber matting or timber dunnage. The load can then be restrained with fewer lashings.

However, as the provisions of the Load Restraint Guide identified above did not form part of the performance standards in that Guide, they were not mandatory.

After Mr Springer had identified that the driver's side stanchions could not be installed, the lower pipe racks were secured to the tray of the truck with two chains running through the racks. The chains were secured using load binders. The load binders were secured along the driver's side of the truck in order to enable the driver to keep an eye on them along the journey to Fairview. The load binders were new Ev-cam binders, but Mr Springer's evidence was that he had no difficulty in using these.

With the benefit of hindsight, it would have been preferable to place the load binders on the same side of the trailer as the stanchions, as when the chains were released there would have been a hard barrier in place between the workers and the pipe racks.

A further two white pipe racks were then placed on top of the three pipe racks in an inverted position in the channels created by the three pipe racks, as

demonstrated by figure 1.⁴ The top pipe racks were secured in place with another chain and load binder. Mr Springer's evidence was that this was an accurate picture of the way in which the racks were loaded.

Mr Springer said that he had not previously loaded five pipe racks onto a trailer with no other load because this was a waste of the trailer's load capacity. Two or three pipe racks were generally placed on top of other materials such as drilling pipe or pods. On this occasion he placed the five racks on the same trailer in order to avoid having to do two separate trips from Yebna to Fairview.

After another trailer was attached to the trailer carrying the pipe racks, Mr Lammas and Mr Springer then travelled along an unsealed road to the Fairview well site. The journey covered public and private roads. The distance to Fairview was only 48 km but the trip took approximately two hours because of the rough road conditions. The truck stopped four times along the way to ensure that the load remained secure, and to adjust the tension of the binders if necessary. Mr Springer indicated that the binders securing the pipe racks did not require any adjustment during the trip.

Mr Springer's evidence was that he had received a safety induction when he joined Lucas drilling. This took place at Darra in Brisbane. His evidence was that rig moves generally followed the same sequence. This meant that the makeup and configuration of loads was predictable, apart from the ancillary materials left at the end – the "snot load". He acknowledged that the driver of a truck has discretion in terms of the way in which loads were configured.

Tony Lammas' evidence was that he did not know whether he, as tool pusher, or Mr Springer, as truck driver, was in charge at the time of the loading of the pipe racks. Although he agreed that he was the second most senior member of the crew, no toolbox meeting, Take 5 or other form of risk assessment was undertaken at the site before the truck was loaded.



Figure 1

⁴ Exhibit B2, while there was some contention about the accuracy of the re-enactment this picture is included to illustrate the load position.

Inspection of the load binders by the OCRs

The truck exited the Injune to Taroom Road in order to make its way to Fairview. It was met approximately 5km from Fairview by Mr Scheffe and Mr Hobday, Operating Company Representatives (OCRs) attached to Rig 151. They were not employed directly by Santos but worked for Fendley Consultancy, which contracted its services to Santos.

Mr Scheffe had over 28 years' experience in drilling in roles ranging from lease hand to rig manager and company man. He had received specific training in relation to safety and load restraint. In his evidence he agreed that he had an oversight role in relation to safety on drilling sites. If he saw something that was unsafe he would stop the job and discuss it directly with the crew involved or with the rig manager.

Mr Scheffe had been asked to take a photograph of the load binders on the truck driven by Mr Springer. He did not pay attention to the load or its configuration. Mr Springer, who released the preload and the chain and then reengaged the preload, also gave him a demonstration of the load binder.

Mr Scheffe indicated that he was asked to take photographs of the load binders in use to secure the load on the truck because of an incident involving another drilling company some two weeks earlier. That incident involved an over centre "dog" type binder, unlike those employed by Mr Springer. That type of binder was regarded as unsafe and it was being phased out.

Mr Hobday and Mr Scheffe gave evidence that, as OCRs, they played no role in the movement of drill camps or rigs. The role of the OCR on a well site commenced when the equipment necessary to commence drilling was on the site, and drilling was ready to commence. While OCRs attended toolbox meetings and will engage in safety discussions on site, either the rig manager or the night tool pusher led these.

The OCRs' evidence was that a pre-spud meeting is held on each well site, which recognises the commencement of the OCRs role on the well site. The OCRs then oversee drilling operations on behalf of the lease owner up to the point that the rig is released and the well is secure.

Unloading the pipe racks

Following their meeting with the OCRs, Mr Springer and Mr Lammas proceeded to Fairview. Before entering the new well site they unhitched the rear trailer and dolly and proceeded into the well site, where the vehicle was parked.

Mr Lammas' evidence was that he got out of the passenger side of the prime mover and walked around the front of the vehicle where he joined Mr Springer. They stood beside the prime mover on the driver's side near the front of the trailer. Mr Cole, who had just finished his break, joined them and they proceeded to have a general conversation about the day's events, including the placement of the pipe racks after unloading. The three blue pipe racks and

another pipe rack already on site were Santos racks and needed to be moved to another location.

At this time Mr Springer began to release the chains that were restraining the pipe racks. Instead of releasing only the chain restraining the top two inverted pipe racks, he released all three chains while the top racks remained sitting on top of the lower racks. Mr Springer said that he then heard a noise and felt something hit. When he turned around he saw that Mr Cole was pinned under one of the blue racks. With the assistance of some other workers on the site he lifted the rack off Mr Cole.

Mr Springer agreed that there was a mechanical loader available on the Fairview site to unload the racks. He agreed that he had restrained the blue racks in place before placing the white racks on top because he knew that it was likely that one of the blue racks would otherwise fall off. He agreed that if he had unloaded the racks in a reverse sequence the blue racks would not have fallen from the truck. He also agreed if he had undertaken a “take 5” or “step back” prior to unloading the incident may not have occurred.

Mr Springer acknowledged that he was familiar with the use of “exclusion zones”, and that when unloading a truck with the assistance of machines, it was necessary to have other persons clear of the unloading area.

Conclusions with respect to the adequacy of the vehicle

I was urged by Santos and Lucas to find that the vehicle (including the trailer and associated fittings) carrying the pipe racks was adequate because the pipe racks were loaded and carried without incident from Yebna to Fairview, secured firmly by the chains and binders.

However, I do not consider that the trailer deployed to carry the five pipe racks was adequate for the load as configured on the morning of 14 August 2009.

The trailer would have been adequate if all four stanchions were in place, a smaller number of pipe racks were carried, or the pipe racks were configured to prevent them falling once the binders were released. It was not possible to fit four stanchions in the circumstances.

Consistent with the Load Restraint Guide, the trailer could have been fitted with pockets across the deck to enable posts or stanchions to be fitted in various positions to provide direct restraint of the pipe racks.⁵ These structures are not

⁵ The Load Restraint Guide provides, at page 213

Vehicles regularly carrying loose plate, sheets, boards, rods, pipes and other similar items should be fitted with pockets along the sides and across the deck in various positions so that stakes, pins, pegs, posts or stanchions can be fitted where required to provide direct restraint. Any removable stake, pin, peg, post and stanchion must be designed to prevent it from becoming dislodged during a journey by adequate engagement length in its socket or by the use of a positive locking method. Separate detachable frames which are adjustable in position with provision for stakes, pins, pegs, posts or stanchions can be used as an alternative to fixed pockets on the vehicle.

novel, and are depicted in the Australian Road Transport Suppliers Association 2004 publication, *Design of Vehicle Body Systems for Load Restraint Compliance*.⁶

The Load Restraint Guide places a shared responsibility on the owner, the driver and the person in charge of loading to ensure that the vehicle's load restraint structure, attachments and load restraint equipment is suitable. This shared responsibility is also reflected in laws imposing liability on parties in the "chain of responsibility" such as the *Heavy Vehicle National Law*.

I acknowledge that the nature of loads referred to as "snot loads" can be variable. However, the evidence at this inquest indicated that these loads were carried with high frequency. Although variable, the loads had common elements, and often included pipe racks.

I do not consider that it was acceptable for the pipe racks to simply fall from the back of the trailer when the chains and bindings were released. The provision of additional options to restrain the load during carriage and unloading would have minimised the risks associated with the load.

The safety management system for rig moves in 2009

Mr Andrew Antony the General Manager, Safety, at Santos gave evidence at the inquest. His evidence was that a pre-qualification process was first undertaken with respect to Mitchell (subsequently Lucas) drilling's safety capabilities in November 2004. This was undertaken in accordance with the major contract EHS management system evaluation guideline, which is based on Australian Standard 4801 – Occupational Health and Safety Management Systems. They were subsequently assessed as having a compliant system in December 2004.

Mr Antony's evidence was that the contract with Santos made Lucas responsible for rig moves associated with Rig 151, including both the logistics and planning for the move. Safety obligations were imposed under clause 21 of the contract, including requirements to have a safety management system, safety management plan and safety procedures. Santos periodically reviewed Lucas's compliance with its safety obligations by means such as audits, site inspections, and requests for an improvement plan.

Lucas Drilling provided evidence that a Safety Management Plan for the movement of plant and equipment associated with Rig 151 was in place on 14 August 2009. Its elements included a Rig Move Risk Assessment, a Rig Move Plan and an Operational Risk Register. Safe Working Instructions (SWI) were provided to the crew of the rig and a Job Safety Analysis (JSA) or "take 5" was expected to be completed before undertaking tasks.

The way in which the elements of the Safety Management System were applied to the movement of the rig was considered in the evidence of the Rig Manager

⁶ Accessed at <http://www.artsa.com.au/library>

at that time, Mr Justin Smith, the Tool Pusher, Mr Tony Lammas and Mr Springer.

Justin Smith

Lucas Drilling promoted Justin Smith from driller to rig manager of Rig 151 in April 2009. Prior to that he had been working in the drilling industry for approximately 18 years, including previous periods of employment with Mitchell Drilling, a company that was subsequently taken over by Lucas.

Mr Smith's evidence was that the standard operating procedures that were in place while he worked for Mitchell Drilling were the same as those employed by Lucas Drilling. As rig manager he required employees to acknowledge that they had read a JSA or SOP by signing the back of the document. This was supplemented by on-the-job training.

Mr Smith would satisfy himself that employees were operating in accordance with the standard operating procedures by conducting observations of critical tasks and forwarding these to health and safety coordinators in head office. He did this at least twice each week.

Mr Smith said that when he started in the drilling industry he regarded the "company man" or OCR as his boss on the well site. However, that had changed and the company man was now only in charge of what is in the ground and the rig manager is in charge of what is above the ground on the site. An OCR was present on each shift to ensure that Lucas complied with its contractual obligations to Santos. It was clear that the OCR had no involvement with rig and camp movement.

Mr Smith's practice was to discuss planned activities and associated SOPs and JSAs with the crew in a toolbox meeting at the commencement of the shift. Shifts generally ran from the midnight to midday and midday to midnight. The tool pusher, Mr Lammas, who Mr Smith considered to be equivalent in status to the rig manager, oversaw the night shift.

Lucas Rig 151 had a comprehensive Rig Move Plan⁷ that covered rigging up and rigging down procedures with 35 and 39 steps respectively. Each step had an associated JSA or SWI. A move of Rig 151 involved at least 27 discrete trailer loads of plant and equipment.

Mr Smith's evidence was that rig move folders were kept in the "smoko room" and staff could locate specific JSAs there. However, there was no standard work instruction in relation to movement of the pipe racks, as these were not considered essential for rigging up or "spudding". His view was that the pipe racks would come under a general SWI for unloading or loading trailers. He described part of his responsibilities as being to keep under review and challenge JSAs and SWIs.

⁷ Exhibit C4

Mr Smith's evidence was that he was not familiar with the Rig Move Risk Assessment document from August 2008.⁸ Incorrect load rigging was identified in this risk assessment as a potential risk event at 1.2.5. The risk assessment identifies existing risk controls for this risk as including "SWIs, JSA, training, competency/certification; supervision". The consequence is identified as "minor", the likelihood as "unlikely", and a risk rating of "low" is allocated. In his evidence, Mr Smith disagreed with these risk ratings. He said that it was possible to challenge the ratings with health and safety coordinators in the Lucas head office.

Securing devices (load binders, straps) were also identified as a potential hazard with an associated risk event of "pinches, strikes, blows, strains and falls" at 1.2.10 and 1.3.4 of the rig move risk assessment. Here the consequences are identified as "moderate", the likelihood as "possible" and a risk rating of "high" was allocated. A remedial action of phasing out over centre load binders and replacing with ratchet or recoilless types was identified. As this action was identified as complete, the residual risk was identified as "low".

Mr Smith considered that the actual loading and unloading of the truck should have been considered as part of the risk assessment. He said that a demarcation area was in place around trucks and that no one else should be involved in that area, apart from the truck driver, a spotter and the forklift operator. The Lucas Safe Work Instruction titled "Loading and Unloading Santos Trailer"⁹ directed as follows when unloading the trailer:

- *Using front end loader with qualified operator, lift baskets from trailer and place where required.*
- *Watch for loose objects.*
- *Ensure personnel are clear.*
- *Use a spotter.*

With respect to load configurations Mr Smith's evidence was that "snot loads" were left to the discretion of the truck driver and the forklift operator.

Mr Smith was aware of the Rig 151 Operational Risk Register.¹⁰ His evidence was that this register was updated every week through the use of HAZOP forms. This register identified a range of risks associated with heavy loads and equipment and securing devices. Existing controls were identified as "SWI's, JSA, Training, Competencies / Certification; Supervision; Rig up checklist".

Driving on public and private roads was identified as a separate hazard with an associated risk event of "accident due to poorly secured loads". A similar range of administrative controls was identified as being in place, and a risk rating of "medium" was allocated. A further risk reduction in the form of "introducing load

⁸ Exhibit B28

⁹ Exhibit C5

¹⁰ Exhibit C30

distribution and securing guidelines” was identified, with the residual risk being “medium”.

Mr Smith agreed local risk assessments were carried out on the rig before undertaking tasks in the form of JSAs and SWIs, and then when a task was being undertaken a SLAM (stop, look, assess and manage) was carried out.

A pre-start safety or “toolbox meeting” was conducted on the morning of 14 August 2009. Lucas provided a pro-forma for this meeting and it was required to be minuted.¹¹ The pro-forma required that relevant Job Safety Environment Analyses and SWIs for the shift were to be reviewed and recorded, and that all crew members were involved in this process. Attendees, including Mr Cole, were required to sign the form.

However, Mr Lammas and Mr Springer did not attend the toolbox meeting because they were travelling to Yebna. Mr Smith’s evidence was that he would have expected that Mr Springer and Mr Lammas would have conducted a toolbox at the Yebna site to discuss what they were going to do in terms of loading and unloading.

As the night tool pusher, Mr Lammas was experienced in conducting toolbox meetings, and Mr Smith had been present when he had conducted them. In Mr Smith’s view the Fairview toolbox meeting only related to the activities at that site, not at Yebna.

Mr Smith’s evidence was that he had divided his crews into three teams on 14 August 2009. One team was responsible for establishing the rig at Fairview. Another was responsible for rigging down the camp at Yebna, and another (Mr Lammas and Mr Springer) was picking up the snot load. The plan was to get the camp “spotted” before lunch time so that the crew that were rigging down could get some rest ahead of the night shift.

In March 2009, Mr Smith had been appointed as the site safety manager for all rigs under his control.¹² This appointment was made under s. 692 of the *Petroleum and Gas (Production and Safety) Act 2004*. It required, among other things, that Mr Smith ensure that each person at the site comply with standard operating procedures and other measures necessary for the safety of the site and persons. Mr Smith’s evidence was that he had not received any training about this role. However he acknowledged that he had received a wide range of training in safety, including hazard identification and risk assessment and management.

Mr Smith was not present at Fairview at the time of the incident leading to Mr Cole’s death. He had travelled to the old camp site at Yebna to take a safety harness to enable workers to get onto roofs at that location. His evidence was that Mr Cole was left in charge at the Fairview site when he left because he was the senior driller, and was competent to oversee the rigging up process. Upon

¹¹ Exhibit B15

¹² Exhibit B16

Mr Lammas' return Mr Cole would have resumed his role as driller, as Mr Lammas was the more senior crew member.

Tony Lammas

Mr Lammas, the tool pusher, was aware of the standard work instructions that applied to the drilling operation. He had worked in the drilling industry for five years at the time of Mr Cole's death. In his evidence at the inquest, he agreed that drilling work was perceived to be much more dangerous than ancillary tasks such as rig moves.

With respect to the rig move he was able to identify that there was a safe work instruction for loader operations. He had reviewed this instruction in April 2008. It included as step 7, "No-one to stand around trailer while loading is taking place". While there was no instruction for unloading, he agreed that this was equally applicable to the unloading of a trailer.

Mr Lammas was not able to recall seeing the rig move risk assessment prior to Mr Cole's death. While Mr Lammas said that he used the "take 5" process before every task in drilling work he did not have a discussion with Mr Springer before the load binders were removed. He did not recall ever seeing SWIs used or reviewed for a rig move. He did not know why there was no risk assessment undertaken before the truck was loaded or unloaded on 14 August 2009.

Mr Lammas was involved in the review of the safe work instruction for rigging up and rigging down in March 2008. He had a range of qualifications including "operate vehicle in the field", "undertake occupational health and safety activities in the workplace" and "apply risk management processes".

Mr Lammas said that toolbox meetings were in place to enable workers to review the SWIs. He was familiar with the concept of hierarchy of control and taking steps to bring risk down to an acceptable level such as eliminating the risk or engineering it out.

Mr Lammas had no specific training in load restraint. He said that his role in assisting Mr Springer was as an off-sider and it was Mr Springer who secured the load.

Robert Wallace

Mr Robert Wallace is Lucas' manager for Health, Safety, Environment and Quality. In his evidence he indicated that issues of load restraint were primarily matters for the truck driver, and that training was provided to drivers in relation to industry specific loads.

Mr Wallace identified several job safety analysis forms as examples of how risks were managed prior to the incident.¹³ In his view these should prompt the development of a safe work instruction, initiated by the rig manager.

¹³ Exhibit C40.32

Conclusions in relation to the adequacy of the safety management system in place on 14 August 2009

The focus of the inquest was on the safety management system in place to manage the risks associated with the transport of equipment between well sites on 14 August 2009.

The evidence indicated that the movement of rigs involved a set and predictable pattern of loads and that the “snot loads”, which came at the end, were seen as less predictable but also less risky.

The evidence also indicated that the processes of rigging up, rigging down and drilling for gas were the focus of the safety management systems in place at that time. Drilling for gas was the “main game” and it was perceived as the activity with the most risks attaching to it.

Lucas was subject to a range of contractual obligations with respect to safety. I accept that Lucas had implemented a comprehensive range of risk documentation underpinning the drilling operation. However, in practice this documentation was of peripheral relevance to rig moves. Mr Springer clearly lacked an understanding of these documents.

In 2009, the Lucas transport division operated separately to the rig crew and did not appear to embrace a safety culture in the same way as the rig crew. The truck driver was not included in toolbox meetings and lacked awareness of the Rig Move Plan, relevant Safe Work Instructions and Job Safety Analyses. There was not a shared understanding of the risks involved in a rig move between the rig crew and the transport workers.

There was also a lack of clarity in relation to who was in charge of loading and unloading operations at both Yebna and Fairview. Some crew members regarded the truck driver, Mr Springer, as primarily responsible. This contrasts with the responsibilities for site safety held by Mr Smith under the *Petroleum and Gas (Production and Safety) Act 2004*. It was also acknowledged that in Mr Smith’s absence, as a matter of practice, Mr Lammas assumed safety responsibility for the site.

In the context of a rig move that entailed at least 27 trailer loads, I do not consider that it was sufficient to rely on the Mr Springer’s interpretation of the Load Restraint Guide. The truck driver will not always be responsible for loading and unloading. The person who loaded the vehicle will not always be present when the vehicle is unloaded.

As noted above, the Load Restraint Guide sets out that responsibilities are shared between the vehicle owner, the driver and the person in charge of loading. Many elements of the Guide are open to interpretation. How the elements were implemented should have been clear to everyone involved in rig moves, including the crew of Rig 151.

There should have been a specific reference to the ancillary loads in the risk management framework including the Rig Move Plan, and more clarity around the requirements for standing clear during loading and unloading operations.

At the very least, there should have been a specific requirement for a “take 5” or SLAM before loading and unloading commenced for each load in the rig move.

The current safety management system for rig moves

Consistent with my conclusions about Lucas Drilling’s safety management system for rig moves, it is clear that Santos also considered that there was scope for improvement of Lucas’ performance in relation to the systems it had in place for rig moves after Mr Cole’s death. Mr Antony’s evidence was that Santos made five recommendations for improvement:¹⁴

- a. *Lucas incorporates Rig Move Plan audits into their Audit program.*
- b. *Lucas makes sure that all relevant personnel including all truck drivers are fully conversant with the requirements of the Rig Move Plan.*
- c. *Relevant truck drivers attend the pre rig meetings to participate in the planning of the rig move.*
- d. *Lucas review and update the Rig Move risk assessment and update the Rig Move Plan accordingly.*
- e. *Loads should be reviewed and planned prior to each rig move.*

In his evidence, Mr Wallace indicated that he had seen significant improvements in Lucas’ safety systems. Mr Wallace attributed the improvement, measured by a significant reduction in recorded injury rates, to cultural changes within the organisation.

In 2009 the concept of the “Lucas Safety Zone” was introduced, tied closely to concept of SLAM. Whenever a task is commenced workers are now required to consider the safe work method statement. If there is no SWI they should undertake a SLAM. Mr Wallace monitors performance around these matters.

Mr Wallace said that after Mr Cole’s death there was a greater emphasis on training both rig crew and professional truck drivers and in monitoring their performance through auditing by transport supervisors. An enhanced Rig Move Plan was developed which included the position of “load master” to oversee how loads were secured by truck drivers using a loading inspection checklist, in which the truck driver would sign off on a number of criteria.

With respect to the operations of the Lucas transport division, Mr Wallace indicated that Lucas had engaged an external party to work through and

¹⁴ Exhibit D6

understand the key tasks that formed part of that business area, and establish a set of work procedures based around job safety analysis. Specific safety management plans have been established around the transport function.

Dr Stephen Pearson is the Manager, Health Safety and Security for Santos (GLNG). Dr Pearson provided the inquest with a statement setting out a range of initiatives undertaken by both Santos and the Coal Seam Gas Industry Leadership Group. These initiatives include the implementation of CSG Logistics Safety Code of Practice¹⁵ in December 2011, designed to ensure that all participants are aware of their responsibilities in the supply chain. The CSG Code includes safe loading and unloading practices including mass dimension and load restraint.

Dr Pearson stated that within Santos work locations Loading and Unloading Exclusion Zones¹⁶ (LUEZ) industry guidelines have been used as best practice guidance to separate people from loading, unloading and material handling equipment. LUEZ is not currently mandated in other sites. Under these guidelines once a person breaks an exclusion zone all work is to cease.

The Santos EHSMS includes a Land Transportation Standard that provides standards and guidelines applicable to the use of heavy vehicles. This has been drafted to allow compliance with “chain of responsibility” requirements under relevant legislation. This standard requires contractors to have systems in place that meet or exceed the requirements of the standard. Rig moves must now be carried out in accordance with the “How to Guide – Rig Moves” and compliance with the requirements of the standard is audited.

Dr Pearson’s evidence was that the CEO leadership group had been effective in driving cultural change in their respective organisations, and engaging frontline leaders in safety discussions.

Conclusions with respect to the current safety management system

I am satisfied from the evidence of Mr Wallace and Dr Pearson that there have been significant improvements to safety generally, as well as in relation to managing the risks associated with rig moves, by Lucas, Santos and the CSG industry.

Lucas has revised its Safety and Health Management System as a whole, as well as its systems with respect to the transport of equipment and plant. Lucas now requires that a risk assessment is made for specific loads and a safe operating procedure is in place for particular loads.

I accept that Lucas has implemented an enhanced Rig Move Plan that addresses journey management, communication, monitoring and reviews and toolbox/pre-start meetings. Lucas also has a range of procedures covering matters such as exclusion zones, load restraint and load security. The position

¹⁵ Exhibit D7.3

¹⁶ Exhibit D7.4

of “load master” has been implemented for particular loads, and truck drivers receive external training in relation to load restraint and the Load Restraint Guide.

I am also satisfied that Santos has implemented suitable arrangements for managing contractors, including processes for monitoring their safety performance and audits of safety in the field.

I am also satisfied that the CSG industry has acted collectively to enhance an awareness of safety through the range of initiatives outlined in Dr Pearson’s evidence.

The emergency response

After Mr Cole was injured, Mr Springer and other workers immediately attended to him, and Mr Lammas called the Queensland Ambulance Service (QAS). He was provided with instructions on the first aid that he was to give to Mr Cole, including providing shade and not to move him.

The Queensland Ambulance Service received the initial 000 call at 10:47am on 14 August 2009. The QAS was advised that a male was conscious and breathing with possible internal injuries after being struck by pipe racks. The Injune ambulance was allocated the job with the Taroom ambulance requested to provide back up.

Mr Lammas made two further calls to the QAS. At 11:14am he was notified that a fixed wing aircraft was being sent to Injune and that a helicopter could not be provided. At 11:42am he was advised that the ambulance was around 5 minutes from the Fairview site.

Advanced Care Paramedic (ACP) Tania Rasmussen gave evidence at the inquest. She was notified of the incident at 10:51am. She left the Injune ambulance station at 10:56am, collected the four wheel drive ambulance and picked up a nurse from the Injune Hospital en route. ACP Rasmussen arrived at the scene at approximately 11:55am.

The Electronic Ambulance Record Form (EARF) indicates that Mr Cole was ready for transport to Injune at 12:40pm. At 12:54 he went into cardiac arrest and CPR efforts continued until 1:29pm along the Injune-Taroom Road. ACP Rasmussen’s evidence was that it was necessary to stop several times on the journey from the incident site to obtain an accurate reading on the cardiac monitor in order to ascertain if Mr Cole’s cardiac rhythm was asystole, and whether they had to continue with resuscitation measures.

Senior Constable Carpenter travelled with the RFDA team, including Dr Elaine Clark, and met the ambulance, which had attended the scene, approximately 35 km from Injune on the Injune-Taroom road. Mr Cole was declared deceased by Dr Elaine Clark at 1:40pm.

There was a suggestion at the inquest that ACP Rasmussen’s arrival at the scene was delayed because of difficulties she experienced in locating Fairview.

Her evidence is that she was contacted and given information to respond to the scene at Lucas Rig 151 and that she would be met along the road.

The emergency management plan in place at Fairview required that a member of the rig crew be available to guide an ambulance onto the site. On 14 August 2009 Mr Benjamin Williamson, who was a member of the Rig 151 crew, played this role. Mr Williamson waited for the ambulance at the signpost for Lucas Rig 151 on the main road and guided the ambulance along the shortest route to the site.

ACP Rasmussen said that there were no difficulties in locating the site as she was told to look for a sign identifying Lucas Rig 151, or she would be met at the entrance to the turn off. She simply proceeded along the Injune-Taroom Road until she saw the sign and a company car on the side of the road. It took her about one hour to travel from Injune to the site.

ACP Rasmussen's evidence was that upon arriving at the scene she formed the view that Mr Cole had suffered severe injuries. After placing him in the ambulance her intention was to meet the Royal Flying Doctor Service who were on the tarmac at Injune.

Senior Constable Carpenter continued to Fairview after meeting the ambulance carrying Mr Cole. Senior Constable Carpenter's evidence was that he had no difficulty locating the site of the incident but suggested that signage for turn off points might be made clearer when new sites are established.

Senior Constable Carpenter's report indicated that the forensic pathologist had expressed a view that Mr Cole's death may have been prevented had he reached hospital in a timelier manner and that a helicopter should have been called to the scene.

The Queensland Emergency Medical System Coordination Centre was notified of a pending air emergency at 10:51am. After it was concluded that the nearest helicopter was out of range. At 11:20am a Royal Flying Doctor Service aircraft was dispatched to land at Injune airport, the closest landing strip.

The evidence of Professor Stephen Rashford, Senior Medical Advisor, Queensland Ambulance Service, confirmed that due to the remoteness of the site, the most appropriate aeromedical response was a fixed wing aircraft.

CareFlight

Dr Alan MacKillop, the Chief Medical Officer for CareFlight, gave evidence at the inquest. Dr MacKillop has specialties in anaesthesia and pain medicine. Dr MacKillop said that the Surat Basin Rotary Wing Medical Evacuation Service was established in 2011 by the consortium of companies involved in gas exploration in Southwest Queensland – Santos, Arrow, Origin and Queensland Gas. CareFlight was successful in the tendering for the service

This is a dedicated medical rescue helicopter service capable of both day and night time flights. Aircraft are based at Toowoomba and Roma with dedicated accommodation for aviation and medical crews. The service is staffed 24

hours, and has a daytime response time of 30 minutes and an evening response time of 60 minutes. However, the helicopter is generally in the air within 20 minutes of a task being accepted.

The CareFlight helicopter is generally crewed by an aeromedical specialist or trainee in the final year of training (emergency medicine or intensive care specialists), together with an intensive care paramedic. This service responds to the needs of workers in the gas fields together with the community in general. Since commencement Queensland Health has tasked it approximately 200 times and 20-30 percent of missions are for the general public.

The helicopters operated by CareFlight are subject to tasking from the Queensland Clinical Coordination Centre in Brisbane. Tasking that is required in response to an ambulance request is initiated through that Centre. The service is also able to accept direct tasking from client's representatives in Southwest Queensland.

The helicopters are equipped with medical equipment consistent with what is available in an emergency department in a major teaching hospital, including ventilators and a portable ultrasound machine.

ACP Rasmussen's evidence was that distances in the remote Queensland where it was necessary to travel 100 or 200 kilometres to reach a scene would always pose a challenge and there were circumstances where a helicopter or other services were not available to reach these scenes faster than a vehicle.

ACP Rasmussen said that the CareFlight service is now regularly used and is often able to transfer patients from a remote location to a tertiary hospital in Brisbane within an hour. This contrasts to the previous situation where it would take two hours to transfer a patient by road to a small rural hospital in circumstances where the patient would then require another transfer to a tertiary hospital.

Conclusions with respect to the emergency response

I am satisfied that on 14 August 2009 the most appropriate form of emergency response was put into place and it was impractical to engage a helicopter to evacuate Mr Cole due to the distances involved and difficulties in having to refuel.

I accept the evidence of the relevant medical specialists, including Professor Rashford, Dr MacKillop and Dr Donaldson, that Mr Cole's death would not have been prevented had he reached the Injune hospital sooner.

Mr Cole required very urgent chest surgery, which would only have been able to be carried out if the injuries he sustained had occurred in close proximity to a major trauma centre. A helicopter would not have delivered him to such a facility in time to enable treatment.

I am satisfied that the current emergency response, including the CareFlight medical evacuation, gives workers at remote worksites, and the general

community in the Surat basin, access to a high quality and timely standard of care. Those within the catchment area of this service enjoy access to emergency medical services that parallel those enjoyed in metropolitan areas.

Autopsy results

Pathologist, Dr Eric Donaldson, carried out a full autopsy examination on 18 August 2009.

The autopsy revealed evidence of severe chest injury. There were multiple rib fractures. There was a puncture of the left lower lobe of the lung by the fractured seventh rib, resulting in a large left haemothorax (bleeding into the chest cavity) and collapsed left lung.

After considering all of the available information Dr Donaldson issued a certificate listing the cause of death as:

- 1(a) Multiple injuries including fractured left ribs leading to punctured and collapsed left lung with large left haemothorax.*
- 1(b) Severe blunt force/crush trauma.*

Dr Donaldson's evidence at the inquest was that the severity of Mr Cole's injuries meant that he would not have survived unless he had received urgent treatment at a tertiary hospital.

Findings required by s. 45

Identity of the deceased – Cameron Brandt Cole

How he died – Mr Cole died after he was crushed by a heavy steel pipe rack that fell from a flatbed trailer after the chains and load binders restraining a load of five pipe racks were released. The pipe racks and other equipment had been transported from the Yebna North 2 well site to the Fairview 272 well site, and were being unloaded at the time of the incident.

Place of death – Injune-Taroom Road, Injune, Queensland

Date of death– 14 August 2009

Cause of death – 1(a) Multiple injuries including fractured left ribs leading to a punctured and collapsed left lung with a large left haemothorax.

1(b) Severe blunt force/crush trauma.

Comments and recommendations

Section 46 of the *Coroners Act*, insofar as it is relevant to this matter, provides that a coroner may comment on anything connected with a death that relates to public health or safety or ways to prevent deaths from happening in similar circumstances in the future.

The fact that Mr Springer, Mr Lammas and Mr Cole did not consider that it was necessary to stop, step back and assess the risks associated with the unloading task at Fairview on 14 August 2009 is indicative that a “safety culture” was not operative in relation to rig moves at that time.

In the circumstances, Mr Lammas and Mr Springer should have been aware that there were no hard barriers in place to prevent the load falling from the truck once it was unrestrained. They should have been aware of the need to establish an exclusion zone around the truck during the unloading operation. Even when engineered controls are in place, it is necessary for workers to be vigilant in relation to potential hazards in the workplace, and to feel that they can be supported in “stopping the job” to prevent harm.

The identification, elimination or minimisation of risks through risk management processes may lead to the production of a suite of documentation that will pass audit requirements. However, the evidence at this inquest suggests that workers in the field may find such documents hard to comprehend and of limited relevance to their daily activities.

In order for a safety culture to be developed, it is necessary that all workers be actively engaged in an ongoing way in the identification of risks and the design of controls to eliminate or minimise those risks. It is also necessary for organisations to demonstrate leadership in terms of developing shared understandings of safety, and in effectively monitoring workplaces to assess the effectiveness of the risk management framework.

Initiatives of the Coal Seam Gas Industry Leadership Group, such as the “Safer Together” forum, demonstrate a commitment on the part of the industry to achieving safer outcomes for workers. I encourage Santos and other CSG companies to maintain their efforts in collaboration to enhance safety leadership and a safety culture. Included in these efforts should be the development with safety regulators of a framework to enable lessons learnt from incidents, including “close calls” and “near misses”, to be shared quickly and openly.

Mindful of the difficulties associated with framing meaningful recommendations six years after the events leading to Mr Cole’s death, I make the following specific recommendations:

1. That Santos, together with the CSG Industry Leadership Group and the Australian Road Transport Suppliers Association consider the implementation of suitable additional hard barriers to prevent rig equipment from shifting during loading, haulage and unloading, and that

provision for such barriers be incorporated into rig move plans and associated risk management documents.

2. That these findings be referred to the National Transport Commission for consideration in the current revision of the National Load Restraint Guide, including whether:
 - that Guide should place more emphasis on specific practices and procedures for the safe unloading of vehicles;
 - provisions for the direct restraint of loads through measures such as posts or stanchions should be mandatory; and
 - Loading and Unloading Exclusion Zones (LUEZ) industry guidelines should be incorporated in the Guide.

3. That the Queensland Government consider whether the National Load Restraint Guide applies to the operation of vehicles on land that is not a public place and, if not, take steps to ensure that its application is extended under relevant chain of responsibility legislation, including the *Heavy Vehicle National Law (Queensland)*.

I close the inquest.

Terry Ryan
State Coroner
11 September 2015