QUEENSLAND COURTS

CORONERS COURT OF QUEENSLAND

FINDINGS OF INQUEST

CITATION:	**Inquest into the deaths of Danny George CHENEY**
TITLE OF COURT:	Coroners Court
JURISDICTION:	Cairns
FILE NO:	2009/3029
DELIVERED ON:	16 February 2018
DELIVERED AT:	CAIRNS
HEARING DATE(s):	19 October 2015, 9 February 2016, 6 – 9 June 2016 & 5 – 9 September 2016
FINDINGS OF:	Kevin Priestly, Coroner
CATCHWORDS:	Construction, high voltage transmission towers and lines, spacer installation, electrocution, deviation from safe work method, sufficient knowledge.

REPRESENTATION:

Counsel Assisting	Jesika Franco
Next of Kin	Mr Kevin Cheney
John Holland	Kerri Mellifont QC with Geraldine Dann, instructed by Corrs Chambers Westgarth
Stephen Sasse	Chris Murdoch, instructed by Corrs Chambers Westgarth

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Introduction

In 2009 Powerlink engaged John Holland Group to construct high voltage transmission lines between Strathmore and Ross, west of Townsville in North Queensland.

In November 2009, Danny George Cheney was a Stringing Supervisor with John Holland. He was transferred to the Strathmore Ross Project and promoted to Construction Manager. However, in transition to that position, he acted as a Stringing Supervisor while becoming familiar with the project.

One of the tasks was to install spaces between the conductors on the spans between towers 323 and 338, a distance of 7.5 km. There were six pairs of conductors. Spacers prevent adjacent conductors contacting each other thereby damaging the conductor. The upper and middle phase conductors were installed using a helicopter. However, the helicopter could not install spacers on the lower phase due the proximity of an existing high-voltage transmission line that was in service. It was decided that the lower phase conductors on the side closest to the existing transmission line be installed using a conductor cart. This involved the use of an elevated working platform (EWP) to lift the conductor cart into place directly beneath the conductors, attaching the cart so it was suspended from the conductors, transferring a worker from the EWP to the cart and lowering the EWP down and clear of the suspended cart. The worker on the cart installed spacers on the conductors while a ground crew with a line attached to the cart towed him between locations. Although the conductors were not commissioned or carrying mechanically generated electricity, they were energized via electro static induction from adjacent parallel energized high voltage transmission lines or conductors. Therefore, there existed the risk of electrocution unless the conductors were effectively earthed.

During the week before 5 December an Activity Method Statement (AMS) was developed to address how this work was to be performed. Essentially, the AMS required each span of the lower phase conductors to be earthed at each supporting tower using an earthing lead. Workers in the EWP would don insulated gloves and attach one end of an earthing lead to the steel of the supporting tower and using a hot stick to keep clear, attach the other end of the same earthing lead to the conductor. Mr Cheney was a member of the group that developed the procedure.

On the morning of 5 December Mr Cheney and his crew attended tower 323 to start placing spacers on the conductors. Mr Cheney used an elevated platform with another worker to attach the conductor cart. See photographs of the scene in the Appendix. Instead of earthing the conductors to each tower at each end of the span, he earthed the conductors to the elevated platform. He did so without a hot stick and with only one hot glove. Once the cart was suspended from the conductor with Mr Cheney positioned in it, the EWP was lowered. Mr Cheney started to disconnect the earths. While doing so, he was electrocuted.

Mr Cheney was rescued by Queensland Fire and Rescue Service personnel nearly two hours after the incident. A second EWP was used and the conductors were earthed to the towers. They checked the conductors and then removed Mr Cheney from the trolley and took him down to the ground where he was taken to the Townsville Hospital. He was deceased. An autopsy revealed that Mr Cheney died from electrocution.

Coincidentally, photographs were taken immediately prior to the electrocution that depict the positions of Mr Cheney, the elevated working platform, the conductor cart, and the conductors.

Essentially, the reports from the investigations of Comcare and John Holland conclude that Mr Cheney died because he failed to follow a safe working procedure as reflected in the AMS.

However, I was left wondering why a respected and well qualified worker would choose a different method of earthing and a method that was reportedly fraught with risk. And how that could occur in the context of a supposedly effective safety management system and more immediately, a trained work crew?

The role of a coroner is to conduct an investigation and making findings about who died, when that person died, where the person died, what caused the person to die and how that person died. A coroner also has a role in reviewing and analysing the circumstances of a death to identify any lessons that might be learnt to prevent a death in similar circumstances.

Based on the evidence gathered during the course of the coronial investigation, there is sufficient evidence to make findings about who, where, when and what caused the death of Mr Cheney. No detailed analysis about these issues is required. However, further investigation and analysis is required to get a better understanding of how Mr Cheney died. In particular, why did he deviate from an agreed safe method of earthing and what lesson might be learnt by John Holland and others from the possible reasons for that deviation.

I approached the further investigation and analysis of this matter by:

- developing a detailed narrative of the events surrounding the incident and its immediate aftermath;
- reviewing the investigations into the incident by Comcare and John Holland; and
- reviewing and analysing the further information that came to light during the coronial investigation and hearing about how the risk of electrocution was managed then and in the past.

The Narrative

At about 6:30am[1] on the morning of 5 December 2009 Mr Cheney conducted a pre-start meeting at Ravenswood Camp. About 31 employees attended the meeting and each work crew was assigned work for the day. One of the tasks for that day was installing spacers on the lower phase of the conductors commencing from tower 323. During that meeting Mr Cheney decided that Macquin Parungao, Aden Ellem and Marcelino Laspobres would install the spacers with him. Mr Laspobres, Mr Ellem and Mr Cheney had installed spacers previously using a conductor cart, however Mr Parungao had not[2]. Mr Cheney gave no directions to his crew to obtain gear[3] available from Ravenswood camp to carry out the task[4] and he didn't obtain any equipment himself. Similarly, the crew, who by then were aware of the work they were to do, didn't collect any the equipment for the task.

Mr Ellem didn't obtain any gear as he returned to the camp to collect his belongings in the expectation of flying out that afternoon[5]. He later recalled Mr Parungao and Mr Lasprobres grabbing some rope and maybe some earth leads. He didn't see any hot sticks.

Mr Parungao thought that Mr Cheney would grab the hot sticks and hot gloves[6]. He had one earthing lead in his truck, however it did not have a clamp on the end. He did not grab any other equipment.

[1] Mr Ellem says work started at 6:30am. Mr Parungao says work started at 6am.
[2] Exhibit E3.2 Statement of Macquin Parungao dated 8.12.20096
[3] Hot sticks, earthing leads or hot gloves.
[4] Exhibit E3.2 Statement of Macquin Parungao 8.12.2009 paragraph 54.
[5] Exhibit E1.4 Statement of Aden Ellem dated 21.12.2009 paragraph 29
[6] Exhibit E3.2 Statement of Macquin Parungao dated 8.12.2009 paragraph 53

Mr Laspobres was originally scheduled to do jumpering or to put the bridging or jumper connections across the straining towers[7] until he was tasked as part of Mr Cheney's crew. He couldn't explain why there were no hot sticks[8].

Mr Cheney drove a ute and the rest of the crew travelled separately in another ute from Ravenswood Camp to the Woodstock site office, arriving just after 7am[9]. Mr Cheney got the AMS and other documentation, including time sheets for the crew, from Mr Francis Novis and Ms Erin Daley. This was likely the first time Mr Cheney saw the final AMS[10]. The crew did not receive a copy of the AMS. The AMS set out how to complete the task, including earthing of the conductors to the towers at either end of the span prior to attaching the conductor cart to the conductors.

The crew obtained the conductor cart and assembled it[11]. They also grabbed a spare tyre for Mr Parungao's ute and at least one earthing lead[12] that was about 4 to 6 meters in length with one clamp at one end and the other end was split into two with clamp at each end[13]. No one obtained hot gloves, or hot sticks. The crew travelled in separate utes leaving Woodstock site office at about 9:15am[14]. On arrival at tower 331 to collect spacers, none were found. Nor were there any at tower 331A. The crew drove to tower 335 and collected about 80 spacers putting 40 in each ute before driving to tower 323 to commence work[15].

The elevated work platform was already at tower 323 with an operator provided by the contractor. The EWP was earthed to the tower as required[16]. It is not clear if Mr Cheney gave directions as to where the EWP was to be set up or if it was already in place prior to the arrival of the crew.

The crew started to unload the truck and discussed who was to do what. Mr Ellem described this as an "informal tool box meeting"[17]. Sometime between then and the commencement of the task, all crew except Mr Cheney signed and dated the Structure Climbing Work Permit[18]. Mr Cheney had signed this permit on 4/12/2009.

Similarly, sometime between then and the commencement of the task; Mr Ellem, Mr Cheney and Mr Parungao completed their "start cards"[19]. There is no evidence that Mr Laspropres completed a start card.

Mr Laspobres put on his working at heights harness as he assumed he would be the person to start installing the spacers[20]. Mr Cheney said it was a long task and would require two people to complete. Mr Cheney and Mr Laspobres would perform the task with Mr Ellem organising the ground side of things[21]. Mr Parungao would assist with the loading the cart onto the conductors from the EWP. Mr Cheney decided he was to go first[22].

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[7] Exhibit E2.2 Statement of Marcelino Laspobres dated 10.3.2010 paragraph 48
[8] Exhibit E2.2 Statement of Marcelino Laspobres dated 10.3.2010
[9] Exhibit E7.1 Statement of Francis Novis dated 8.12.2009 at paragraph 21
[10] There is no attachment to E7.4 email sent by Novis allegedly attaching the AMS and cc'ing Mr Cheney into correspondence on 4.12.2009.
[11] Exhibit E1.4 Statement of Aden Ellem dated 21.12.2009 paragraph 33.
[12] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 62 however note E3 dictated version as per Macquin Parungao dated 5.12.09 at point 3 "leads" implies more than one.
[13] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 63
[14] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 67
[15] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraphs 67-77
[16] This does not effectively earth the EWP bucket- merely the machinery.
[17] Exhibit E1.4 Statement of Mr Aden Ellem dated 21.12.2009 paragraph 36
[18] Exhibit D11 Structure Climbing Work Permit page 4
[19] Exhibits D7 and D8 and ex statement of Macquin Parungao para 81
[20] Exhibit E2.2 Statement of Marcelino Laspobres dated 10.3.10 paragraph 7
[21] Exhibit E1.4 Statement of Mr Aden Ellem dated 21.12.2009 paragraph
[22] After a game of paper scissors rock. Exhibit E2.2 Statement of Marcelino Laspobres 10.3.10 paragraph 8

The conductor cart was loaded into the EWP with a quantity of spacers, rope and two earthing leads[23]. Mr Cheney then asked if there were any hot sticks. Mr Parungao said he didn't have any and he also didn't have any hot gloves. Mr Cheney said that he had hot gloves in his ute and went to collect one pair[24].

Both he and Mr Parungao got into the EWP and secured the safety harness lanyards to the EWP.

Mr Ellem asked about the paper work. Mr Cheney said he had the AMS but didn't have a task risk assessment, the senior engineer was coming out on site and he was bringing a spare one. Mr Cheney asked him to complete it[25]. He said he didn't understand how to do a TRA[26]. Mr Paranguao told Mr Cheney he had a spare in the truck. Mr Parangao said that he would do it when he came down[27]. The necessary checks reflected in that paperwork were not completed.

Mr Cheney directed Mr Parungao by saying "okay let's go". The EWP was raised. Mr Cheney then directed Mr Parungao to swing the EWP basket away from the tower and close to the conductors[28].

Mr Cheney reportedly felt a little bit of a zap but didn't elaborate[29]. Mr Cheney directed that the earthing leads be attached. Mr Parungao attached the earthing leads to the anchor point on the EWP where Mr Cheney's lanyard was also attached[30]. Mr Cheney then attached the other end of the earthing lead which split into two, attaching each end clamp to each conductor. Mr Cheney told Mr Parungao to come up slowly. The EWP was raised until it was in alignment with the conductor. The pair manoeuvred the cart into play and put each wheel of the cart onto the conductors[31].

Mr Cheney was on board the cart and told Mr Parungao to go down slowly. The EWP was lowered about 2 meters, leaving the cart suspended from the conductors. Mr Cheney's lanyard was still attached to the EWP. Mr Parungao then asked if he should remove the earth. Mr Parungao did not hear a response. He saw Mr Cheney wearing a hot glove on his left hand and a riggers glove on his right hand. Mr Cheney was in the process of working the clamps of the earthing lead from the conductors. He was using two hands near the clamps. At that time Mr Cheney's lanyard was still attached to the EWP basket. Mr Cheney experienced "a jolt of electricity"[32].

Mr Parangao tried to remove the earthing clamp attached to the lanyard point of the EWP however it was difficult to grab the nut on the clamp with the hot glove. Mr Parangao received 4 electric shocks[33]. He persisted in efforts to undo the clamp, and then held the cable in the centre of the basket to avoid contact with anything else.

One end of the split earthing lead was hanging. Mr Parangao grabbed and held it apart from the other end of the earthing lead.

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[23] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 85
[24] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 90-95
[25] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 100 and Exhibit 1.4 Statement of Mr Aden Ellem dated 14.12.2009 paragraph 38
[26] Exhibit E1.1 Statement of Mr Ellem dated 6.12.2009 paragraph 5
[27] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 102
[28] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 109
[29] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 110
[30] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 113-116
[31] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 113-116
[32] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 127
[33] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.09 paragraph 131

The EWP was rendered in-operable due to the electric current.

The emergency helicopter on call was not able to effectively carry out the rescue of Mr Cheney due to the nearby energised conductors. Mr Cheney was rescued nearly two hours later by the Qld Fire and Rescue Service. A second EWP attended and the conductors were earthed to the towers. The conductors were checked to ensure they were effectively earthed, and then Mr Cheney was removed from the cart, taken to the ground and to the Townsville Hospital.

Mr Ellem was involved in retrieving Mr Cheney and found his lanyard still connected to the EWP was pulled taut. The earth leads were lying tangled on top of him, not attached to anything at the time of the rescue[34].

I find Mr Cheney was in the process of disconnecting the earths attached to the conductors when he was electrocuted. There is the possibility that his lanyard, on the lowering of the EWP, may have unexpectedly restricted his movement, complicating the task and or distracting his attention while performing what was already a risky procedure with less than optimum protection.

Safe Working Procedures

What procedures were in place to manage the risk of electrocution while installing spacers using the conductor cart?

There were documents that reflected the "safe working procedures", including an AMS, a Structure Climbing Working Permit, a Plant and Hazard Permit, a Pre-Start Meeting, a Task Risk Assessment (TRA) and the Start Card.

The AMS set out a process for "earthing" prior to commencing work on the conductors (at item 3.1.9 through to 3.1.12). In short, the EWP was to be used to earth the conductors to the towers at each end of the span, install the conductor cart onto the conductors and commence installing the spacers. The EWP was to be earthed by an earth stake into the ground or to the towers[35].

The AMS was finalised the day prior, on 4 December 2009.[36] It was prepared in draft form by Engineer Francis Novis when it became apparent the helicopter couldn't be used to install spacers on the lower phase of the conductors from towers 323 to 338. This became apparent in late November. Mr Novis provided a draft AMS to Mr Barrass, Safety Officer, on 2 December 2009[37]. Mr Novis had not been involved in installing spacers using a conductor cart. He saw the installation of spacers overseas but without a conductor cart[38]. Mr Novis arranged for Mr Cheney to show the group responsible for devising the AMS how the conductor cart worked, which he did on 3 December 2009[39].

The meeting ran for about 1.5[40] to three hours[41].Mr Hardie, a safety co-ordinator, reported in his statement[42] "what was set out in the AMS and SWMS was agreed upon to be the method to install Spacer Chair and earthing system". The reference material used at the meeting included the draft AMS as well as the SWMS JHP-269 Rev 0[43]. Mr Hardie told the court that

[34] Ex1.1 para 63 and 64
[35] Exhibit D5 and D5.1
[36] Exhibit D5 and D5.1
[37] Exhibit E4 Statement of Mr Ray Barrass dated 8.12.09 at paragraph 1
[38] Transcript week 1, 3-21 at 35
[39] Transcript week 1, 2-95 at 42
[40] Exhibit E8 Statement of Mr Hardie dated 6.12.09
[41] Exhibit E5.4 Statement of Mr Jeff Carew dated 9.3.10 at 20.
[42] Exhibit E8 Statement of Mr Hardie dated 6.12.09 page 2.
[43] Exhibit E8 Statement of Mr Hardie dated 6.12.09 page 2.

earthing to towers was specifically discussed at the meeting. However he could not recall whether there were was any discussion about permanent earths or the earthing at Mudgee[44]. Ms Daley, cadet engineer, told the court only a very small amount of the safety meeting was spent dealing with earthing procedures but the group went through each of the steps so it would have been covered[45].

Mr Barrass told the court a focus on earthing procedures was an integral part of the hazard control and quite a bit of time was spent on this at the meeting.[46] After the meeting, Mr Novis made changes to the AMS document based on the discussion and it was signed off by Mr Novis, Mr Barrass, Mr Green, Mr Algura, Mr Szablowski and Mr Carew[47]. Mr Cheney did not sign off on the document.

There are anomalies in the final AMS:

- At 3.1.11 and 3.1.12 the cart is loaded twice into the bucket of the EWP confusing the actual loading sequence.
- There is only one reference to the use of a lanyard at 3.1.13 requiring it to be attached to the front and back of the cart. There is no reference to the transfer of the lanyard from the EWP to the conductors.
- There is no reference to bonding the bucket to the conductors in order to bring the bucket to the same potential as the conductors after the towers have been earthed at either end of the span.
- There is no reference at 4.1 “activity resources” for the need for hot sticks, hot gloves, earthing leads or climbing harnesses.

Mr Novis issued a Structure Climbing Work Permit for installing spacers using the conductor cart and EWP. A Plant Hazard and Risk Assessment was conducted in relation to the use of the conductor cart. It made reference to the risk of electric shock while moving from span to span over the insulators if earthing’s had not been installed[48]. It is dated 2 December 2009 and was signed by Mr Cheney the following day, at a time when the final AMS was not completed. Mr Barrass and Ms Daley were participants in the assessment and it was facilitated by Mr Novis as Project Engineer and Mr Cheney as Supervisor.

A Task Risk Assessment was not completed by the crew prior to the incident. Mr Cippola, Safety Manager for the John Holland Group, explained the role of the TRA:

“.. the AMS feeds the TRA. It is necessary to know what the AMS says because it has a lot of things that are directly relevant to what the TRA should contain and/or cover. The TRA goes to situationally based things for particular tasks. The TRA is to identify the steps which need to be taken, and the order in which they are to occur. The TRA then goes through the task's steps, the hazards involved with each step, how they will be controlled, and who is responsible for each control. It is, of course, to be done before the task is commenced. The TRA is developed jointly by the supervisor and the crew. It represents the 'team level' aspect of the system. It is the supervisor's responsibility to ensure that the TRA is developed and all members of the crew are directly involved in its development and signed on to it”[49]

Mr Cippola reported that some supervisors take the AMS to site and use relevant parts to develop the TRA. Others would know it well enough and leave it in the office, working with the crew on site to develop the TRA. He described the AMS as an operational risk assessment, the TRA as a team risk assessment and the start card as an individual risk assessment”[50].

[44] Transcript week 1, 4-21 at 30 and 45.
[45] Transcript week 1, 3-43 at 40 and 45.
[46] Transcript week 1, 3-61 at 25
[47] Exhibit D5 at page 2.
[48] Exhibit D10 at page 7
[49] Exhibit D1.1 Statement of Mr Cipolla dated 25.5.16 at paragraph 12 to 13
[50] Transcript week 2, 2-48

Mr Ellem reported Mr Cheney did not appear to know how to do a TRA[51]. There is no evidence of a prior TRA completed by Mr Cheney in the fashion it was to be used at Strathmore to Ross. An earlier TRA on another project was admitted into evidence and appears to include Mr Cheney's name but does not purport to be completed by him and is not signed by him. The training for Mr Cheney on TRA's (exhibit D20.1) includes an assessment to complete either a TRA or a Safe Work Method Statement ("SWMS")[52]. This training was completed when Mr Cheney was working at the Nebo project. The Nebo project did not use TRAs in the same way they were to be used at Strathmore to Ross. Mr Cheney subsequently worked at the Mudgee project where Safe Work Method Statements were used. These were pre-populated documents that did not require employees to separately transpose and list each of the steps involved and the associated hazards.
The pre-start meeting was also an opportunity to discuss the work for the day, equipment required and manner in which it might be performed so as to address hazards. It was not clear to me from the evidence what constituted a pre-start meeting. Some of the evidence suggested the pre-start meeting was convened at the start of the day with other crews present, other evidence suggested it was a meeting on the work site specific to the crew and tasks that crew was to perform.

In any event, there was a meeting at Ravenswood camp with a large group of about 31 employees[53]. Mr Cheney was likely the only stringing supervisor at the meeting. It does not appear the other stringing supervisor was at the pre-start meeting. Mr Cheney allocated work duties to each of the crews. Mr Cheney did not have the Activity Method Statement at that time to discuss with his crew, even if he was so minded and time permitted.

Mr Parungao said Mr Cheney delivered the pre-start meeting, generally discussed where each of us should go but did not go into details about how the work to be done[54]. He said: "I do not know why Danny did not go through the pre-start properly. I have seen him do this before and he would go through it quite thoroughly though I have also seen him before give the pre-start very generally"[55]. He later said: "Normally we have a formal discussion about the hazards and controls. This did not happen on Saturday"[56]. Mr Laspobres said there was no discussion about safety issues[57].

Mr Cipolla told the court the expectation was the crew arrive at the work site where they're going to do the spacer placement, and have a conversation that would cover the TRA, or involve completion of the TRA[58]. This suggests the pre-start meeting served a broader organisational purpose. However, the nature of the work to be performed that day did require an element of planning and preparation in ensuring that all necessary equipment was available at the site, if not taken to the site, particularly serviceable earthing leads, hot sticks and hot gloves. This could be achieved if the AMS was provided to Mr Cheney for him to provide to the crew at a time and place that facilitated securing all of the necessary equipment.

Another procedural check was the start cards. These were completed by Mr Cheney[59], Mr Ellem[60] and Mr Parungao[61]. There is no evidence that Mr Laspobres completed a start card. The start cards included triggers to check that a TRA had been completed, a pre-start meeting had been held with a briefing on the task, the appropriate PPE was there for the task and that it was safe to conduct the task. Importantly, the final step in the start card lists the hazards

[51] Exhibit E1.1 Statement of Mr Ellem dated 6.12.2009 paragraph 5
[52] Exhibit D20.1 Page 10
[53] Exhibit D6- Pre-start meeting record.
[54] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.2009 at paragraph 53
[55] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.2009 at paragraph 55
[56] Exhibit E3.1 Statement of Mr Macquin Parungao dated 7.12.2009 at paragraph 21
[57] Exhibit E2.1 Statement of Mr Marcelino Laspobres Dated 8.12.2009 page 1
[58] Transcript week 2, 2-49 at 40
[59] Exhibit D7 start card
[60] Exhibit D8 start card
[61] Exhibit E3.2 Statement of Mr Macquin Parungao dated 8.12.2009 at paragraph 81- there is no copy of the start card provided by Mr Parungao.

and controls. Mr Cheney has included “Induction” as a hazard and under controls listed “use earths”.

The evidence supports the finding the John Holland had in place appropriate supporting procedures to guide performance of the work to be performed. The AMS set out how the activity was to be performed, in particular, how to earth the conductors to the towers in preparation for suspending the conductor cart. The TRA should have triggered a crew review of the AMS which in turn should have resulted in a crew wide understanding about how the conductors were to be earthed. Even if Mr Cheney did not know how to complete a TRA, he was certainly aware of the general need for the crew to discuss the detail of what and how the tasks were to be performed in light of specific hazards. That was a fundamental element of the older system with which Mr Cheney was familiar.

Mr Cheney was aware of the manner in which the AMS required the conductors to be earthed.

If Mr Cheney followed the procedure and earthed the towers at each end of the span and used a hot stick and hot gloves in connecting the earths, the risk of electrocution would have been reduced and Mr Cheney would likely not have been electrocuted.

However, I return to the originally identified issue, why did Mr Cheney depart from the safe working procedures? What did the various investigations into the incident reveal?

The John Holland Investigation

John Holland formed an investigation team the following day. Stephen Sasse led that investigation. He was an Executive General Manager within the Senior Leadership Team of John Holland and was responsible for safety. His report explains the investigative methodology as follows:

> Our approach is designed to rapidly identify the causal factors underlying the incident in order that any system failures and learnings that have broader application can be identified and shared quickly across the business and beyond. Of necessity this means that there may be minor anomalies in some aspects of the report. That does not affect the causal analysis or findings of the investigation.

The investigation was conducted quickly, with site inspections and witnesses interviewed in the days following the incident. A final draft report was circulated on 17, 18 and 19 December. Copies of the final draft also went to Comcare, Officer of the Federal Safety Commissioner, Powerlink and Chair, John Holland Group Health and Safety Committee. All reportedly offered comments on the draft. But none of the comments went to any substantive issues about methodology or findings. The final version was completed on 2/2/10.

The report contains a detailed sequence of events, similar to the narrative in these findings. He notes the relevant safe working procedures and concludes that the failure to earth per the AMS was the primary cause of death. There were also several subsidiary failures including failure to carry out a pre-start meeting, failure to develop a TRA in accordance with the AMS and Structure Climbing Work Permit, failure to use a shot stick to attach the clamp head to the conductors and failure to use hot gloves when handling earthing cables.

Immediately after reporting his conclusion, the next section of the report is headed: Human Factor Analysis. He then reports:

> *All of these failures are Human Factors (“HF”) issues. In analysing HF failures we use a precise taxonomy to identify type of HF failure. The rationale for this approach is to ensure that the investigation does not fall into the trap of identifying the cause as human error, and fails to go into the organisational causes of incidents. This is of*

particular importance in construction, where onerous commercial arrangements can drive a culture of production at all costs. It is well established that conflicting goals – production v safety – are a common cause of failure to comply with procedures. The JHGPL Safety Policy requires incident investigators to include organisational risk factors in determining conclusions as to causation.

Secondly, in making findings in relation to unsafe acts, it is important to understand whether the act in question was error based on lack of skill, a poor decision or a perceptual failing; as opposed to an violation which is an intentional breach of procedure.

Mr Sasse then shows an outline of the Human Factors Analysis and Classification System (HFACS) – and purports to apply this process to the incident.

He starts with Organisational Contributory Factors and notes:

- Mr Carew and Mr Cheney discussed the time to complete installation of the spacers, Mr Carew made it clear it would take two days but Mr Cheney considered it might be done in one;
- The project was operating under a benign commercial arrangement and there was no evidence Mr Carew was imposing any undue pressure to complete work;
- Mr Novis reported the work was behind schedule but felt under no pressure to hurry it up;
- Mr Cheney may have felt under pressure to complete the work quickly. He may have been affected by the general culture in the industry and possibly a self-imposed deadline, possibly to demonstrate his capability;
- It was conceivable that Mr Ellem's departure that afternoon contributed to a perception that the job had to be completed in a hurry although his departure was scheduled well after normal work finished.

The next heading is Unsafe Supervision, where Mr Sasse reports:

There is without a doubt a failure in supervision. The AMS provides very specific requirements in terms of consultation with the work crew; the importance of earthing the conductors; and the technique of earthing. The facts demonstrate that supervision was not only inadequate, but was actively involved in the execution of inappropriate operations.

The next heading is Unsafe Acts – Errors or Violations. Mr Sasse reports:

The HF framework makes a distinction between 'errors' and 'violations'. In order to determine where the crew's actions fall across that spectrum, it is necessary to identify the level of knowledge held by the crew in relation to the risk of induction shock and proper earthing techniques.

Mr Sasse then details the induction and training undertaken by Mr Cheney and his crew, the requirements of the AMS which Mr Cheney joined in developing, their experience with SWMS for installation of spacers and the use of the conductor trolley; ultimately concluding that Mr Cheney and his crew knew the proper earthing technique, had the requisite equipment but nonetheless failed to follow required procedures. He categorised the specific failings as 'wilful violations of widely known and vitally important procedures' and referred to the crew operating with such 'extreme disregard of the AMS and associated safety procedures and requirements that the entire safety system was rendered ineffective'.

Very strong and judgemental language to use when characterising behaviour for the purposes of a safety investigation report.

Mr Sasse considers whether the violations were routine or exceptional. He reports:

> *An exceptional violation is one where there is an unusual, unexpected and deliberate breach. The exceptional violation breaks the most fundamental principle underlying all safety management systems, which is that procedures and agreed work methods will be followed.*

He notes three considerations:

- Did the violation occur below the radar?
- Did the violation occur with tacit management approval?
- Did the persons who were part of the violation have the requisite authority to be responsible for it?

Ms Sasse noted the overwhelming weight of evidence supporting the conclusion that there was no practice of poor earthing procedures on the Strathmore Ross Project. All witness statements showed an advance knowledge of the induction shock risk and correct earthing techniques.

In considering tacit management approval, Mr Sasse notes:

> *ELLEM states that the flawed earthing process applied on Saturday 5 December was 'a standard practice' and that 'management were aware of us using that process'. PARUNGAO states that he 'has used an EWP as anchor point in the past on one other job as there was no earthing point other than the EWP'. NOVIS states that he was advised by two other employees that CHENEY had not properly earthed conductors to towers on the Mudgee project. CAREW, in response to ELLEM's assertion states that he is completely unaware of such practice at Nebo or elsewhere, and that there is no document condoning such practices. NOVIS states that a number of employees have told him that CHENEY has sometimes wanted to take risks.*
>
> *ELLEM, LASPOBRES, and CHENEY all joined the Strathmore Ross Project in mid to late November from the Mudgee Project. It may be the case that the Mudgee Project had a level of toleration for inappropriate earthing practices. ELLEM states that the practice had been approved by Eddie Lindstrom, Construction Manager at Mudgee and Nebo as well as by inspectors from power utilities Powerlink, Ergon and Energex: all of whom accepted the practice as satisfactory. He also states that CHENEY, ELLEM, and LASPOBRES had all carried out the practice. All of the JHPL documentation referred to does not support this position and there will need to be further investigation as to the practices elsewhere in the JHPL Power Division as well as a review of wider industry practices. It is however reasonable to conclude that there may have been isolated areas within the broader industry section that tacitly approved the inappropriate earthing practices. It should be noted that Powerlink does not and is not required to approve JHPL's work methods. It should also be noted that Powerlink does not approve or otherwise endorse the use of EWP's as earthing circuits.*

After addressing the topic of Requisite Authority, Mr Sasse concludes:

> *All safety management systems are founded on the assumption that the participants who operate within the systems and whose wellbeing is the primary objective of those systems will approach the safety management system with respect and with the intent of compliance. This does not mean that the safety management systems should not*

recognise and cater for organisational risk factors and human factors such as error of skills, judgement and perception. There is however a limit to any systems ability to cater for a participants determination to operate completely outside the system; failure to comply with its procedures and standards; and failure to utilise the tools and techniques provided by that system. No system can be designed to cater for covert and wilful non-compliance.

It is a rare to conduct an investigation such as this and not find systems failures within the organisation. In this tragic incident, risk assessment procedure was fully fit for purpose and was thoroughly and conscientiously applied to the propose scope of work. Once on site, the crew operated completely outside the AMS. The safety management system cannot be expected to withstand an unexpected and unpredictable decision of the most senior and experienced company officer on site to operate wholly outside of the system, the corporate safety values and the precepts contained in the Activity Method Statement.

Ms Sasse made the following recommendations in his report:

1. All employees of John Holland Power engaged in stringing and ancillary activities and in the supervision and management of such activities be subject of a competency assessment on induced voltage and associated earthing procedures.
2. All future employees of John Holland Power who are engaged in stringing and ancillary activities and in the supervision and management of such activities be subject of competency assessment on induced voltage and requisite earthing procedures.
3. Pending the completion of recommendations one and two, any activity which requires earthing of conductors should be on a Permit to Work basis, authorised by the Project Manager and the most senior OHS Professional attached to the Project.
4. The Operations Manager and nominated OHS Professionals should investigate the merits of installing permanent earth circuits on conductors until such time as the construction phase is complete, thereby removing the need for repeated ad hoc earthing.
5. Activity Method Statements relating to stringing and ancillary activities should be reviewed to determine whether or not there is value in incorporating the use of non-contact voltage detection instruments as part of the isolation process.
6. A comprehensive and anonymous survey should be carried out among all current and past John Holland Power staff and employees to ascertain the prevalence of unsafe earthing practices.
7. A concerted communication programme should be undertaken with all blue collar and staff employees, ensuring that they are aware of their rights to stop work where procedures are not being complied with. This should include recognition of cultural issues with respect to Filipino workers.
8. All employees should be advised that the false completion of Start Cards and Permit to Work documentation is a fundamental breach of their conditions of employment and will result in summary dismissal. Aden Ellem should be subject to formal warning for the false completion of his Start Card on 5 December 2009.
9. Macquin Parungao should receive formal recognition for his attempts to isolate Danny Cheney and to ascertain his wellbeing after the incident.

I will return to an analysis of the investigation report later in my findings. However, for the purpose of what is to follow, it will be important to note. :

- The stated purpose of the report was 'to rapidly identify the causal factors underlying the incident in order that any system failures and learnings that have broader application can be identified and shared quickly across the business and beyond'.
- Ms Sasse found that Mr Cheney and his crew had the relevant knowledge through training and access to the necessary equipment but Mr Cheney chose not to follow the earthing procedure prescribed in the AMS.
- However, the competency of employees (present and future) on earthing procedures be assessed.
- In the meantime, earthing should be subject to a Permit to Work regime and the AMS be reviewed.
- The prevalence of unsafe earthing practices be investigated by anonymous survey.
- Greater effort required to ensure workers are empowered to stop work if there are concerns about compliance with safe working procedures.

On the face of this report, there was nothing about which a safety regulator might be concerned.

The Comcare Investigation

The incident was investigated by Comcare. John Holland was licensed by the Australian Government as a "self-insurer" for the purposes of the Commonwealth workers' compensation legislation. Under that scheme, a licensee is an organization, approved by the Safety, Rehabilitation and Compensation Commission, to meet the cost of its workers' compensation liabilities and manage its own workers' compensation claims.

Certain Commonwealth authorities and eligible private corporations may apply for a licence to self-insure under the Safety, Rehabilitation and Compensation Act 1988. Licensees under this Act are exclusively covered by the Commonwealth's Occupational Health and Safety Act 1991.

As at 15 March 2007 the Commonwealth government introduced legislation (the "Coverage Amendment Act") which extended the coverage of Commonwealth occupational health and safety legislation to include organizations under the Safety Rehabilitation and Compensation Act. The two key provisions of the legislation are:

- Extended coverage of the occupational health and safety legislation to include corporations with self-insurance coverage under the Safety Rehabilitation and Compensation Act;
- Exclude the operation of State or Territory occupational health and safety legislation including electrical safety legislation from applying to such entities (including John Holland Pty Ltd).

Comcare conducted an investigation into the death of Mr Cheney, pursuant to the provisions of the Occupational Health and Safety Act 1991. Mr Appleby was appointed investigator. After reporting on the narrative, he concluded

- Mr Cheney was the supervisor, the most experienced member of the crew and was the person directing the other members;
- Mr Cheney failed to earth the conductors to the towers in accordance with the mandatory process set out in the AMS;
- Mr Cheney knew of the requirements of the AMS;
- Mr Cheney did not ensure hot sticks and hot gloves were obtained by crew members prior to commencing the work;

- Mr Cheney failed to use hot sticks and only wore one glove which increased his risk of harm;
- Mr Parungao (a health and safety representative) failed to insist Mr Cheney follow correct procedures and use appropriate equipment, as per his training and knowledge;
- If the earth leads were attached to the conductors in the appropriate manner, the risk of electric shock would have been significantly reduced or removed;
- Had the crew followed correct procedures and used appropriate equipment, the death of Mr Cheney may have been averted.

In relation to John Holland Pty Ltd, the Comcare investigation found:

- The company had taken adequate steps to conduct hazard identification, risk assessments and implement control measures to minimize risks as far as reasonably practicable;
- The company required all employees to undertake appropriate training including individual site inductions;
- All four members of the crew had undertaken the induction for the site of the accident and answered questions in regard to appropriate earthing;
- All crew members were trained in the safe use of conductor carts;
- John Holland conducted weekly toolbox meetings and a meeting was conducted by Mr Cheney on 11 November 2009 which included the topic of earthing to the tower using hot sticks;
- There was a need for the company to remind all employees and contractors of the importance of completing TRA's before commencing work tasks.

As to job culture and time pressure, the investigation found:

- At the time of the accident the work was behind schedule, Christmas holidays were approaching and a large number of employees were about to go on leave;
- There was evidence from employees that the approved method for earthing conductors to towers was a "drawn out process";
- There was no pressure brought to bear on employees to complete work more quickly than normal or in a way that was not in accordance with safety procedures.

The Comcare investigation recommended:

- The company undertake an assessment into the feasibility of permanent placement of earthing leads on all conductors at each straining tower until the transmission lines are handed to the administering entity;
- The company consider instituting a designated responsibility to employees for ensuring the presence, and fitness for use, of PPE for each task, and provide specific, written instruction and training to the employees assigned to this responsibility;
- The company foster a heightened safety culture in which all employees and contractors are encouraged to raise safety concerns with their supervisors;
- The company educate Health and Safety representatives of their emergency powers including the power to stop work where there is a risk to health or safety;
- The company provide all relevant employees and contractors' refresher training on managing risks associated with electrical induction including appropriate PPE and the earthing of conductors to towers and the training should include details and lessons learnt from Mr Cheney's death.

On 22 September 2014 and in response to a query from me, Comcare advised that there had been no audit of John Holland to check whether any of its recommendations were implemented.

Mr Appleby gave evidence about his qualifications and experience at the time of the incident[62]. Mr Appleby told the court that he had no subject matter expertise however he was able to access an expert and ask questions of him about the standard industry practice or method of earthing when working on the construction of transmission towers and stringing of conductors.

In December 2009 Comcare served two prohibition notices on John Holland[63]. This required employees of John Holland to comply with the AMS and comply with the proper use of insulated gloves and hot sticks during the activity. Mr Appleby confirmed that he did not have an expert independently validate or assess the earthing procedures set out in the AMS[64]. Mr Appleby had the benefit of Mr Sasse's investigation as well as additional statements obtained from witnesses and crew.

Mr Appleby found Mr Cheney failed to earth the conductors on which he was working in accordance with the mandatory process set out in the AMS for this activity. The AMS was in his possession and he had a good working knowledge of its contents. Further, it was the decision of Mr Cheney to proceed contrary to the AMS and earth the conductors via the EWP[65]. Mr Appleby was asked if he had to first accept that the AMS in place was adequate in addressing the risks when earthing. He stated: "I believe the AMS was sufficient for what I've said in the findings, that if they followed the AMS closely, then it would most likely have reduced or eliminated that risk"[66]. It is particularly concerning that Comcare did not attempt to explore or investigate why Mr Cheney departed from the AMS by reviewing previous project earthing practices and procedures. An investigation into these areas might have presented opportunities to identify systems issues relevant to John Holland, including a knowledge gap. Comcare did not follow up with John Holland its response to the Comcare recommendations. Comcare was advised of the inquest into the death of Mr Cheney but unfortunately chose not to participate and to provide the court with the benefit of its expert assistance during the inquest.

John Hollands Response

On 29 September 2014, in response to a request from the court, John Holland reported on its implementation of the Comcare recommendations.

Permanent Earths

John Holland reported it undertook an investigation into the merits of installing permanent earth circuits on conductors until such time as the construction phase is complete, removing the need for ad hoc earthing. Its investigation revealed the recommendation would provide a measure of protection by ensuring that the induced voltage has a path to earth at all times. However, concerns were identified.

- The conductor between the permanent earths can have a difference in potential associated with adjacent live circuits. It has been shown even, if earths are applied at each end of a single span, there is still a possibility of a different potential in the mid-span.

[62] Transcript week 1, 1-56 at 25
[63] Exhibit C2 Prohibition Notices
[64] Transcript week 1 at page 60 at 6.
[65] Exhibit C1 report Mr Appleby dated 20.8.2010 page 11 para 65.
[66] Transcript week 1 at 1-59-60

- When working in an area between the permanent earths, unless you can physically see the earths you cannot be sure that they are applied or applied correctly.

John Holland reported it did not want to create an environment of complacency but rather an environment of focused risk assessment. By relying on permanently installed earths, there may be a tendency for employees not to identify additional risks associated with live line undercrossing, adjacent live circuits and other potential risks of accidental livening. By maintaining an earthing permit policy for each specific worksite there is a heightened focus on the risk assessment and a buy into "No Earths, No Work." The principle is simple: before work can commence, a site specific earthing permit is put in place which requires testing using a voltage detector. The detector identifies any residual voltage in the system. The earths are applied and the site is agreed safe to continue work. When work is complete, the earths are removed and the site is then returned to an inaccessible condition.

The investigation concluded the installation of permanent earths cannot replace the need for ad hoc site specific earthing, however it does provide an additional safety measure in the event the site specific earthing is not adequate.

The investigation recommended that John Holland continue the current earthing permit and earthing procedure which is site specific, requires a permit for each tower site, and permanent earths be left on all strain towers which have jumpers connected along the length of the line until construction is complete.

PPE

John Holland reported it had comprehensive procedures regarding PPE. All employees, visitors and subcontractors have an obligation to wear the appropriate PPE at all times whilst on the John Holland controlled workplace. Workers are required to:

- Visually inspect their PPE for faults and damage prior to use to ensure that it is fit for its intended purpose;
- Use the correct PPE for the task they are undertaking and to use it in accordance with the manufacturer's requirements; and
- Supervisors are responsible for ensuring that the correct PPE is used and maintained across the workplace.

The on-site John Holland HSE personnel are responsible for:

- Planning and conducting training in the correct use and maintenance of PPE and in the identification of faults;
- Ensuring that site PPE requirements are communicated to workers via induction and regular toolbox meeting;
- Maintain a site register of PPE issued;
- Ensuring that signage is established and placed at entry points and in prominent areas where PPE must be worn; and
- Ensuring that visitors attending the site are advised of the PPE requirements prior to entering the site.

The workplace managers are required to ensure the selection, introduction, maintenance, training and use of PPE is appropriately implemented across the workplace.

John Holland reported its induction procedure applies to everyone who attends a John Holland workplace and recognizes the importance of conducting inductions in workplaces to ensure information regarding specific hazards, their controls and legislative requirements are

communicated. This is done through general inductions, high risk construction work inductions, site inductions and task specific inductions. A purpose of the inductions is to ensure that workers are familiar with workplace hazards and their controls, including John Holland's policy regarding PPE.

The company's procedure on the temporary earthing of transmission lines requires workers to wear the following PPE:

- Hard hat;
- Non-synthetic or flame retardant full body coverage clothing (ankle to wrist);
- Protective footwear;
- Eye protection; and
- Fall arrest/restraint PPE consistent with the task and access method.

I expect these comprehensive procedures existed at the time of the incident with Mr Cheney. The issue is why it didn't prove effective in that situation.

Safety Culture

John Holland reported that through its Learning and Development team, it developed a cultural program known as Speak Up Speak Out. This program was conducted for Philippine workers by Learning and Development staff alongside a person affiliated with the Philippines community acting as a conduit. John Holland continued to run the Speak Up Speak Out program, and in August 2014 the Palmerston to George Town OPGW Installation project received acclaim from Comcare for a strong safety culture and the Speak Up Speak Out program.

Throughout 2010 John Holland provided workers with information via memoranda and emails, various activities, toolbox talks, information sessions and training to foster a heightened safety culture. It commissioned People Knowledge Consulting to conduct a survey of past and current employees to determine their experiences with earthing practices of de-energised high voltage transmission lines. People Knowledge Consulting reported:

> "The general essence of the feedback was encouraging with most ratings indicated a healthy respect for the prioritization of worksite safety. Aggregated responses indicate a very positive work site culture of consultative and inclusive safety and planning practice. Respondents reported feeling free and empowered to challenge others if they believed they were operating unsafely and there was a unified sense of compliance in following mandatory safety procedures (e.g. signing onto the heights permit and rescue plans and regularly writing out TRAs/JSAs/SWMSs). In conjunction to this all participants agreed that John Holland provides all of the essential safety equipment that they require to do their jobs."

John Holland commissioned Krause Safety & Training Pty Ltd to conduct an OHS culture survey of employees on the Strathmore to Ross Project in Queensland and the Bridgewater Project in Tasmania to:

- Identify the strategic strengths and limitations of the projects' safety culture;
- Measure against a baseline of industry employees, supervisors and managers, the trends in perceptions and attitudes of employees on the two projects;
- Provide recommendations to the senior management team on specific actions, initiatives or systems based on the results of the survey.

Krause Safety and Training Pty Ltd conducted 109 culture surveys in which employees were asked 57 questions. In September 2010 the consultants reported to John Holland on the state of the safety culture and the results were used to identify further areas for improvement.

John Holland reported it continued to develop its safety culture across all its workplaces. The company has a dedicated Speak Up telephone line and email address where workers are encouraged to report safety and ethical concerns if they are reluctant to raise them directly with their supervisor or manager. John Holland introduced a HSE Behaviours framework which is aligned to its values of Integrity, Innovation, Collaboration, Accountability and Care. The behaviours framework is built around the themes of Standards, Communications, Risk Management and Involvement and presents everyone with descriptions of HSE-related behaviours which are expected of Everyone, Supervisors and Managers.

Refresher Training

John Holland conducted a series of meetings with project workers, including HSRs, prior to commencing work (toolbox meetings). In addition John Holland conducted information sessions with project workers. The tool box meetings were held on 7 January, 13 January and 14 January 2010. At the toolbox meetings workers were reminded of:

- The need for everyone to refocus on safety;
- Everyone's legal responsibility to take reasonable care for their own safety, the safety of their co-workers and of other people on site. Workers were reminded that if they felt something was unsafe or they felt uncomfortable doing something they should stop the activity, reassess the task and discuss it with their supervisor;
- The use of Start Cards to identify hazards and risks, to implement controls and to stop work if the controls cannot be up in place;
- The requirement for subcontractors on site to follow John Holland procedures on safety and incident reporting;
- The requirement on all workers to report all incidents and near misses;
- All workers are required to read and to understand the Activity Method Statements and Task Risk Assessments relevant to the work they are performing;
- The steps required to earth conductors including the use of hot sticks and HV gloves.

The information sessions were held on 23 and 27 January 2010. Workers were presented with information reinforcing the permits to work procedures and the requirements to complete Task Risk Assessment and start cards before completing a task to ensure that hazards and risks are properly assessed prior to work commencing.

John Holland reported development of POW-2-138 Temporary Earthing of Transmission Circuits (now ER-MPR-WHS-007) and then conducted extensive training on the procedure, operation of the earthing permit including authorized personnel, knowledge of earthing procedures and hold points, and the benefits of effective isolation.

Awareness sessions for the procedure were conducted at the Strathmore to Ross Project on 16 and 17 December 2009. The course objective was to ensure that all staff involved in earthing of de-energised circuits were provided with sufficient information and instruction to perform their tasks safely, implement safe work practices and to achieve compliance with the new isolation procedure, to trial the earthing of transmission circuit and earthing permit, and to provide guidance on the use of earthing permit in a practice environment.

John Holland reported that workers at the Strathmore to Ross Project were inducted into the new procedure on 25 January, 29 January, 1 February and 17 February 2010; received

training in hazard and risk identification on 2 February 2010; and undertook training in the application of temporary earth leads and clamps on 28 April and 29 April 2010.

Workers at the Strathmore to Ross Project attended a 2 day course on Electrical Awareness Safe Working Near Exposed Live Parts conducted by Ergon Energy on 28 and 29 January 2010.

John Holland reported it sponsored workers at the Strathmore to Ross Project to complete their Certificate III in Electrical Supply Industry – Transmission and Certificate III in Electrical Supply Industry – Distribution. Workers received instructions for their certificates in groups of 8 from 19th to 30th April 2010; 10th to 14th May 2010; 7th to 11th June 2010; 14th to 18th June 2010; 9th to 27th August 2010; 13th to 24th September 2010 and 18th to 29 October 2010.

To my mind, the most important features of the work undertaken after the incident was the introduction of the permit to work regime for earthing and voltage detection equipment as well as training in the use of temporary earthing leads that extended beyond how to earth to include why it is done a particular way.

More Information and Analysis

It is a sad indictment on each investigation that I am no better informed about why Mr Cheney chose not to follow the earthing procedure set out in the AMS. There appear possibilities and lines of inquiry that were not pursued. The coronial investigation sought to better understand the decision, albeit many years later. The approach was to review past procedures and practices, the training provided, the level of supervision and monitoring for compliance, any auditing, lesson learnt from previous incidents and emergency planning and management.

Earthing Procedures and Practises

While the recently developed AMS was clear about the manner of earthing, what previous procedures existed for like tasks? What were the previous practices?

Prior to starting on Strathmore to Ross (inducted 27/11/09), Mr Cheney worked on the Mudgee project involving similar HV power construction. Mr Ellem, Mr Stelica Mica and Mr Elser Mengo were involved in the project at Mudgee and gave evidence that they connected the EWP to the conductors without first earthing at the towers.

Mr Ellem said the process may not have been documented but it was certainly a standard practice. The process of earthing conductors to the EWP rather than to the towers was not a foreign process and was used a lot in both Mudgee and Nebo. He alleged management was aware of the use of that process. They said it was “okay”. In addition, he reported that on a number of occasions they used high voltage gloves without hot sticks. However the use of both hot sticks and HV gloves was the preferred option if they were available.[67] Mr Ellem said when putting spacers on twin conductors the earthing process was to earth the EWP to the Tower and then connect the earth leads between the EWP Bucket and the conductors[68]. He said he was not trained in earthing techniques and was not aware of an instruction requiring earthing at both ends of a span to the nearest towers. To earth the span at each end would

[67] Exhibit E1.2 Statement of Mr Aden Ellem dated 8.12.2009 at paragraph 1
[68] Exhibit E1.4 Statement of Mr Aden Ellem dated 14.12.2009 at paragraph 12

create a great deal of extra work when he thought it is just as safe to use the EWP if it is done properly with the right gear.[69]

Mr Mica said:

> "He had worked on Mudgee before**.** On that project when we were putting spacers on the conductors the procedure we followed for earthing was we take the trolley or cart up in the cherry picker or Elevated Work Platform (EWP) and the man who was going in the trolley would already be inside the trolley when we were taking it up. The EWP would be earthed by driving an earth rod into the ground near the EWP and then connecting the EWP to the earth rod so that the whole EWP was earthed.
>
> The EWP would be raised to the conductors and the earth leads from the EWP would be attached already at the arrestor point of the EWP bucket. We would then attach the earth leads to the conductors using hot stick. We did not usually wear any insulation gloves. Once the earth leads were attached to the conductors we would then attach the trolley or cart to the conductors and then lower the EWP a bit. Again using hot sticks the man in the EWP would take the earth leads off the conductors while the man in the trolley waited. The EWP could then drop away and the man in the trolley could do his work. On this project we did not connect earth leads to the towers at the end of each span. … As far as I know on this project the system of attaching earths has not changed. We still don't attach earth leads to the towers but do it through the EWP's. I have done some training with John Holland on power induction. This was at the Nebo Project after Aden and I were hooked up through induction power. This is where we were shown the way to use a hook, like a hot stick with a hook on the end but this was no good. During this training we were shown how to put earth leads on properly but not where to put them on"[70].

Mr Francis told Mr Sasse that one of the Filipino riggers (Elser Mengo) mentioned to him that this happened on the Mudgee Project. However that is contradicted by what Mr Mengo told Mr Appleby[71]:

> "I have never seen anybody take any short cuts like not earthing properly to the tower and just using the EWP as the earth and not worrying about the tower"[72]**.**

Mr Fomegoes and Mr Laspobres gave evidence about earthing procedures at Mudgee. Mr Fomedgoes said:

> The method in Mudgee in New South Wales was to attach an earth lead to the tower nearest to where you were and then you placed the conductor cart onto the conductors. There were two methods used to lift the cart into position. The first method was to haul the cart up by hand using ropes and the second was to use an Elevated Work Platform (EWP). After the incident with Danny Cheney John Holland made it a rule that when you used hot sticks you also had to use insulated gloves as well. Before Danny's incident it was always a rule that you must not apply the earth lead clamps by hand as you could not get them tight enough, you had to use a hotstick, this was the rule[73].
>
> I am not aware of any times where an EWP has been used as a primary earthing point. When you use an EWP it is still alright to earth it to the conductors but this is only to ensure equal potential and the earthing leads must first be attached to the towers[74]

[69] Exhibit E1.4 Statement of Mr Aden Ellem dated 14.12.2009 at paragraph 46
[70] Exhibit E13 Statement of Mr Stelica Mica dated 18.12.09 at paragraph 3- 13
[71] Exhibit E7.2 Statement of Mr Francis dated 8.12.2009
[72] Exhibit E12.1 Statement of Elser Menger dated 10.3.10 at paragraph 7
[73] Exhibit E10 Statement of Mr Carlos Fomegoes dated 10.3.10 at paragraph 8
[74] Exhibit E10 Statement of Mr Carlos Fomegoes dated 10.3.10 at paragraph 10

Mr Laspobres said:

> The conductors are isolated by earthing them to the towers and then the trolley is suspended[75].
>
> I have been involved in the earthing of conductors many times. First we put the earth leads to the tower and then clamp them to the conductor. When we use a trolley or conductor cart…. The procedure was to put earthing on both ends of the area you were working on….
>
> In my time in John Holland the crews always attach the earth leads to the towers before they start the work on the conductors[76].

Although Mr Jeff Carew was not present at the Mudgee project, he stated:

> I understand that the practice of 'mid-span earthing' was common up to 2 -3 years ago. In my personal experience of the transmission industry, I have never known anyone not to earth conductors out on the towers at either end of the span[77].

Mr Lindstrome was the construction manager at Mudgee. He said in evidence he would definitely not be pleased with that method because it goes against "all my learnings and discussions with the workers". He said it can't be true, I never saw it and if I did see that I would've stopped them immediately from doing that because you can't do that.[78]

It is immediately obvious that there are varying accounts of the ways in which temporary earthing was performed. Why? Did a procedure exist? Was it a training issue? *Did workers with different levels of qualification have a better understanding of earthing practices*? Was it a supervision issue?

The Mudgee Safe Work Method Statement (SWMS)[79] is dated 5 August 2009 and signed by Mr Cheney[80]. It does not include procedures for earthing to towers prior to installing the conductor cart. On page 4, it states: "use a short lead to earth the bucket to the conductor prior to attaching the conductor cart. Earthing to be in place at least each 3 kms when adjacent to live lines". The document makes reference to:

> *.. bond an earth to the bucket of the machine and then using an approved hot stick to attach an earth to the conductor. Ensure EWP is earthed.*

The Mudgee previous SWMS dated 15 June 2009 – JHP 269 Rev 0[81] refers to running earths connected to earthed towers, at each helicopter brake and connected to the earthing mat.

The SWMS dated 11 June 2009 JHP 266 Rev 2[82] refers to "electric shock from electric current and all plant and equipment to be earthed prior to work commencing. Ensure that earthing is in place at both sides of the conductor before work commences. Use appropriate gloves."[83]

Therefore, the documented procedure for installing spacers during the Mudgee Project, the most recent occasion when Mr Cheney performed that task, did not contain a clear outlined procedure to first earth the conductors to the towers prior to bonding the bucket and attaching the conductor cart. There is a reference to earthing the EWP as well as a reference to bonding the bucket to the conductors. There was a requirement to ensure earthing was in place every

[75] Exhibit E2.1 Statement of Mr Marcelino Laspobres dated 8.12.2009 at paragraph 4
[76] Exhibit E2.2 Statement of Mr Marcelino Laspobres dated 10.3.2010 at paragraph 13:
[77] Exhibit E5 Statement of Mr Jeff Carew dated 8.12.09 at page 3 of 5
[78] Transcript week 1, 3-82 at 45
[79] Exhibit D21, D21.1 and D21.2.
[80] D21- 5.8.2009- JHP-269 Rev 0, dated 5.8.09.
[81] Exhibit D21.1
[82] Exhibit D21.2
[83] Exhibit D21.2 at 4 of 10

3 kilometres and this was likely due to the IEEE standards requiring earthing until the end of stringing activities[84]. Neither Mr Cheney nor his crew were involved in the installation of "permanent" earths.

The nature and extent of the knowledge of Mr Cheney about earthing procedures, particularly, why particular procedures were adopted, was unable to be traced through the training records of John Holland. He was not qualified in 'live' transmission line work. Nonetheless, there was considerable reliance on his knowledge during development of the AMS.

It is also interesting to observe he knew the Project Engineer, Francis Novis and Engineering Student Ms Daley were attending the site that morning to watch his crew work on the conductor cart. He therefore knew that the decision not to earth to the towers was going to be immediately obvious to them on arrival. It appears extra-ordinary he would knowingly take the risk of serious injury or death as well as disciplinary action. That would be out of character for a newly promoted, highly regarded worker. This is more likely indicative of a knowledge gap on the part of Mr Cheney as well as a sense of authority to make a change to the method of earthing if operational circumstances suggested it was warranted.

There is also the possibility that Mr Cheney did not appreciate subtle differences between projects about various forms of earths. The permanent earths in place at Mudgee provided a level of protection against the risks of electrocution. Together with the confusion about bonding versus earthing and the lack of clear earthing procedures at Mudgee, Mr Cheney may have thought he was effectively earthing without risk by attaching the earthing leads between the EWP and conductors, and not to the towers.

When Mr Lindstrome was asked whether Riggers understand the distinction between earthing and bonding, he stated "it can be confusing for them[85]". Further, "if you're working in Tasmania a rigger won't be touching the line. Only a lineman is allowed to do that or an apprentice. But in Australia as general, like, in the mainland in general, the riggers can do that work and they are not trained in electricity and it's the people - it's the company that employs them that has to do - well, should do that and - and try and get them up to speed."

Mr Cheney's CV reveals he was an advanced rigger and not a linesman. Mr Scott Anderson was in a similar position as Mr Cheney at the time of the incident. Mr Anderson obtained a certificate 2 linesman in 2000 which authorised him to work on de-energised lines with a qualified linesman.

Mr Anderson said:

> *"I have been asked if I have ever earthed conductors to an Elevated Work Platform (EWP), solely rather than earthing the conductors to the tower, and then using the EWP to attach the conductor cart to the conductors. I have done it that way many years ago, and it worked fine, however I have not followed that method recently. When earthing to the EWP, the EWP is already earthed to the ground, through its setup in position…"*[86]

Mr Anderson explained this at inquest:

> "*Well, you've already earthed the ground before you go up to the ground. You have earth to the bucket that you're standing in, connected. Then you put the earths onto the conductor with a hot stick and that should be either earthed or bonded. I'm not sure what you call that, actually. Sorry. So if it's earthing how is the earthing*

[84] Transcript, week 1, 3-73 at 40. The IEEE standards and reference to 3km earthing is at D1.2- page 36.
[85] Transcript 3-81 at 35
[86] Exhibit E14 Statement of Mr Anderson dated 25.5.16 at 17

achieved?---It goes through the earth into the bucket, into the earth that you've already got to the ground so you earth the same potential."[87]

I heard evidence from an electrical engineer that there is no electrical connection[88] between the bucket on a EWP and its base, rather it is a mechanical connection[89] . The base of the EWP is earthed to the ground to be at the same potential as the towers which are similarly earthed to the ground. The bucket on the EWP is not capable of earthing conductors[90] but the bucket could be bonded to the conductors to bring the bucket to equal potential[91].

After the incident, a separate temporary earthing of transmission procedure was added to the AMS[92]. The procedure required an earthing permit prior to any works being carried out. The permit needed to be signed off by an isolations officer prior to works being carried out. A voltage detection unit was also to be used to ensure the conductors were not "live"[93]. A similar temporary earthing of transmission circuit procedure (exhibit D27) was in place for the John Holland project of Waddamana-Lindisfarne project (in Tasmania) in May 2009.

Returning to the issue of permanent earths, it is not clear if there was an overarching John Holland procedure dealing with permanent earthing, for example when permanent earths are to be taken down in the context of the broader work plan and electrical safety.

After the incident, Mr Cippolla attended Comcare Qld office and provided a document titled Institute of Electrical and Electronic Engineers standards. Mr Appleby noted Mr Cippolla's assertion that this document informed John Holland in the use of all subsequent SWMS and AMS for earthing conductors and stringing activity[94].

Mr Ellems understanding about permanent earthing was they were usually left in place until after installation of spacers was completed and the section is ready to be handed back to the client. Further, there were permanent earths in place at Mudgee and Nebo per the standard practice of John Holland and all other major companies. [95]

To this end, Mr Anderson told the court that there were permanent earths in place at Strathmore Ross originally[96] and he didn't know what happened to them. There was a Register in the office that documented where they were and when they were removed.

Permanent earthing was not in place at Strathmore to Ross, on the section that Mr Cheney was working, at the time of the incident. It is not clear when the permanent earthing was removed. The permanent earthing was likely removed prior to the installation of spacers with the helicopter. It was not required to remain in place as the helicopter only required bonding while installing spacers. Permanent earths may have been removed in contemplation of the helicopter installing the spacers. Therefore, when the AMS was developed, it needed to address temporary earthing.

The significant changes to the AMS post incident were made quickly, within 9 days, by John Hardie Safety Co-ordinator; reviewed by Ray Barrass; and approved by Jeff Carew on 17 December 2009. The changes were not disclosed in the investigation report of John Holland.

The post incident AMS also included a procedure for installation of spacers using a EWP. Mr Scott Anderson told the court that after the incident the rest of the spacers were installed using

[87] Transcript week 1, 4-7 at 20
[88] Or minimal electrical connection- Transcript week 1, 3-78 at 10
[89] Transcript week 1,3-6 at 40
[90] Transcript week 1, 3-78 at 15
[91] Transcript week 1, 3-5 at 35
[92] Exhibit D5.3.1 page 5 3.1.10
[93] Exhibit D5.3.1 page 12
[94] Exhibit C1.3 File note Mr Appleby dated 11.5.2010
[95] Transcript week 1, 2-59 at 35
[96] Transcript week 2, 3-6 at 42

a EWP. The conductor cart was not used[97]. This raises concerns, with the benefit of hindsight, as to whether the use of the conductor cart was necessary, as opposed to quicker. There were other improvements within the AMS, including a more comprehensive summary of resources required with specific references to earthing cables[98], earthing stake, safety harness, hot sticks and rubber gloves[99].

Training about Earthing

Extensive material was tendered into evidence about the training that Mr Cheney undertook. He attended a training program in "Manage Occupational Health & Safety in the Building and Construction Workplace" as part of the Pathway to Excellence training program rolled out by John Holland in February 2008. That training including identifying hazards, implementing controls, undertaking risk assessments, completing a SWMS (steps required) and how to communicate identified risks and control measures to manager, supervisor and colleagues[100]. There is evidence that Mr Cheney participated and completed the *"safety and risk leadership training"* on 14 and 15 September 2009 whilst at the Mudgee project[101].

Part of the training in Manage Occupational Health & Safety in the Building and Construction Workplace required Mr Cheney to complete minutes of a tool box or pre-start meeting. There is evidence of Mr Cheney conducting tool box talks whilst at Mudgee on 21 November 2009, 11 November 2009 and 14 October 2009. Some of these tool box talks are specific with reference to "earthing" and included reminders *"when applying the earths, always apply to the tower/ earth end first. Then apply the conductor clamp using the insulated sticks as provided. Very important: earth first before touching, holding, stepping and working on conductors and remove every part of your body from the conductor first before removing earths. It could be your first/ and or last shock"*[102].

There is very limited evidence that Mr Cheney was trained in the task of installing spacers using a conductor cart from a EWP. Mr Cheney did 'hook ladder and conductor trolley' training provided by Enersafe from 6 October 2009 to 9 October 2009 whilst at the Mudgee project[103]. Mr Laspobres and Mr Ellem were also part of that training. The safety notes in the training documents refer to: "[p]rior to work, conduct pre Work Risk Assessment and make adjustments to work practices accordingly" and "ensure line is proven de-energised and earthed and all staff signed the access permit"[104].

There is no reference to use of hot sticks in the equipment list. Moreover, the training focused on the use of a hook ladder to install the conductor cart and not a EWP. The conductor cart was lowered on the conductors with the use of a hook ladder by rigger positioned on the tower. There is no identified training for the use of a EWP to install the conductor cart.

Mr Sasse gave evidence that "there's certainly evidence in the investigation that he [Mr Cheney] knew the correct earthing practices and techniques"[105]. Further he "was satisfied that all of the formal training on earthing was as it should be. There was no – no formal training provided that wasn't consistent with the correct standard[106]".

[97] Transcript week 2, 3-7 at 18
[98] Although there are only 3 listed in the signed AMS after the incident. A subsequent version that is not signed at D5.4 lists 7.
[99] Exhibit D5.3.1 on page 7-8
[100] Including SWMS reviews and job pre-starts. Exhibit D20.1 at page 7
[101] Exhibit D20.1 page 16
[102] Exhibit D15 tool box talk at page 2 of 8 and exhibit D15.1 toolbox talk 11.11.2009
[103] Exhibit D19 page 3
[104] Exhibit D19 page 6
[105] Transcript week 2, 1-18
[106] Transcript week 2, 1-19

As to the crew's training in earthing procedures, Mr Parungao had worked previously in the Philippines as a rigger. He said that did not receive any specific training from John Holland about earthing of conductors but was aware of procedure that John Holland used which was similar to that used in the Philippines[107]".

Mr Ellem said that he was not shown or trained in any earthing techniques or specific training or procedure for earthing of conductors[108].

Mr Laspropres worked in high voltage power construction projects in the Philippines with most of the work as a transmission linesman before starting with John Holland. He said he was familiar with most aspects of stringing operation, he'd been involved in earthing conductors many times and that involved attaching earth leads to the tower then conductors.

It is concerning that although Mr Parungao and Mr Laspropres report they were familiar with the need to earth to towers, neither did any preparation for installing spacers by obtaining the necessary number of earth leads, hot gloves and hot sticks. Two split earthing leads were clearly not enough, particularly when it came to transfers across insulators onto the next span. At that point, both spans had to be earthed per the AMS. I also note the time it would have taken to reposition the EWP to connect the extra earths. Also, why didn't they speak up if they were aware of the risk to Mr Cheney in earthing differently?

Mr Laspropres gave evidence that he was busy on the ground. He might not have been aware or have noticed Mr Cheney was deviating until it was too late. Mr Parungao said: " …he did not question Danny as I respected him and knew that he was the supervisor on site and would know what he was doing". When Mr Cheney directed the EWP away from the towers, Mr Parungao said he was a "a little concerned' as he expected the first step was to earth the conductors to the towers[109].

After the incident, training was provided to the crew tasked to complete the installation of spacers using the EWP. Copies of the post incident training materials includes 'Earthing/ Bonding Essentials"[110] detailing the technical aspects (including differences) of earthing and bonding with explanations about "why". This level of training is not evident prior to Mr Cheney's death.

Clearly there was a knowledge gap on the part of the riggers without qualifications or experience in live transmission line work.

Roles and Responsibilities

Mr Cheney came to Strathmore to Ross as a newly promoted construction manager. However at the time of the incident he was acting stringing supervisor. On the organisational chart, Mr Cheney is listed as the construction manager, but in the activity method statements the construction manager is listed as Cezary Szablowski.

Mr Sasse said that "the stringing supervisor cohort was down and he was filling that role – which was his previous role – before he took the role of construction manager on that job"[111]. Mr Szablowski was acting in the role of construction manager and stated he was "thrown in the deep end" and "I was, on paper, the construction manager for the job, but was still doing the access and clearing role[112]".

[107] Exhibit E3.2 Statement of Mr Parungao dated 8.12.2009 at page 4
[108] Exhibit E1.4 Statement of Mr Ellem dated 14.12.2009 at page 4.
[109] Exhibit E3.2 Statement of Mr Parungao dated 8.12.2009 at page 10 at 108
[110] Exhibit D1.4 at attachment 33.
[111] Transcript week 1, 1-7 at 20
[112] Exhibit E15 Statement of Mr Cezary Szablowski dated 20.5.16 at page 2.

Mr Sasse said:

> "People often will straddle a couple of sets of responsibilities in any organisation when it's going through a period of change, or if you're mobilising a project, particularly in the construction industry where there's a – a – a culture, I guess, of getting the work done and not a huge focus on whose responsibility – or – or drawing firm lines or demarcations around that responsibility"[113].

Mr Jeff Carew was the project manager for the Strathmore to Ross Project and was Mr Cheney's direct line manager. He was clear that there were no prior induction related incidents at Strathmore to Ross, and if there were any failures in earthing procedures an incident would have happened[114]. Although, as already noted, this was the first time spacer installation was carried out using a EWP and conductor cart. All other earthing procedures necessarily involve installing earths at towers. There was no opportunity or need for mid span earthing.

Audits

Auditing is another opportunity to check compliance and opportunities for improvement within a safety management system. There was evidence of field audits where construction managers, like Mr Szablowski, or safety crew, like Mr Ray Barrass and John Hardie, would perform field inspections and audits. There was a monthly timetable for inspections and audits and at least one of the activities in stringing would be supervised each week[115]. TRAs were checked to ensure the hazards had been identified[116]. But Mr Sasse was unable to use this avenue to demonstrate Mr Cheney had competency in the new TRA process[117].

Following the incident, there were no audits conducted by Comcare to ensure that John Holland employees were complying with the AMS for installing spacers[118].

There was no evidence to suggest that auditing by John Holland detected any lack of understanding or non-compliance on the part of workers about earthing procedures and practices. Given the varying accounts of workers about earthing practices, that fact must raise concerns about the effectiveness of the supervision and auditing. In the context of safety management systems, auditing normally contemplates persons from another unit attending and conducting inspections using methods designed to test the effectiveness of various elements of the safety system. Senior Managers attendances on site are important in terms of safety culture but they don't usually have the skill and knowledge to forensically audit components of the safety management system.

Past Incidents

The court also looked at previous incidents to review the maturity of safe working procedures implicated in incidents (electrocution) and how John Holland responded. There was a previous shock incident at the Nebo project. Mr Ellem and Mr Mica were shocked when Mr Ellem reattached the earth cable to a conductor and proceeded to tighten a loose bolt on the clamp head without using a hot stick or hot gloves. Mr Mica came to his assistance[119]. The pair were installing bridges on tensioning towers.

The John Holland investigation found that the earth cable was pulled tight, which may have contributed to the inadequate fitting of the clamp to the conductor. A recommendation was made to "develop a procedure for earth connection to conductors including - type of connector

[113] Transcript week 1, 1-7 at 35
[114] Exhibit E5 Statement of Mr Jeff Carew dated 8.12.09 at page 4
[115] Transcript week 2, 3-37.
[116] Transcript week 2, 3-37 at 35
[117] Transcript week 2, at 1-44 at 20
[118] Exhibit C5 Email from Comcare dated 9.9.14
[119] Exhibit D22 Nebo Electrical Induction Incident Investigation Report 13.10.08

required, requirements for checking earth cable is correctly connected (this could be included in a review of the current procedure for Isolations.)"[120] It was reported that the position of the EWP bucket did not help the operator ensure adequate connection of the earth clamp to the conductor. It was not possible to sight the connection from the way the bucket was positioned. A recommendation was made to establish a process to ensure the clamp was fitted appropriately and securely attached[121]. The investigation found an inadequate risk assessment was undertaken, concluding operators were permitted to attach the earth cables using 1000volt gloves. This failed to take into account the risk of insufficient tightening by hand and the risk of earth clamps coming loose[122]. A recommendation was made that the SWMS be reviewed to require the use of "hot sticks" to tighten earth clamps, to provide shorter hot sticks and ensure tape was removed from the earth clamps.

Other findings included the need for site training to cover electric induction. There was *no formalised training provided to either worker in relation to working around lines where electrical induction may be present*. The workers only knowledge of the hazard came from on the job experience and information provided by other workers[123]. It was also found there was no training in Emergency Response in relation to electrical incidents. It was recommended all workers undertake specific training and competency assessments covering electrical work, required controls and emergency procedures for electrical incidents, ensuring a process is in place to track that all relevant staff have the required levels of competencies for performing critical tasks, and for workers to be provided with emergency response training[124]. These recommendations were made in October 2008.

It is incredible to think that such basic failures might exist in safety management in the context of major electrical construction work. Mr Sasse commented that he "would be the first to make the statement that the culture of that sector of the industry and, to a degree, that division of John Holland, was nowhere where we wanted it[125]".

There is some evidence of training provided to workers after the Nebo incident, and the SWMS was changed to include a requirement to use hot sticks.

Emergency Response

I conclude my review of the evidence by addressing the emergency response. After Mr Cheney was electrocuted, Mr Carew and Mr Novis both contacted the helicopter with it arriving at 10:40am. It was not able to carry out the rescue. There was then confusion about where to obtain a second EWP[126]. Mr Cheney was not rescued until some 2 hours after the incident using a second EWP.

The emergency response plan did not take into account the possibility that the EWP could be rendered ineffective, the helicopter might not be able to effect a rescue and a backup was not available.

The contingency plan in the Emergency Response (at 1.1.8) provided that if rescue with the Riggers on the ground using the EWP not be possible (because of terrain), a helicopter on standby for the rescue was to fly to the location and facilitate the rescuers access to the cart from above. Mr Barrass emailed the emergency helicopter notifying of the crew of the plan on 4 December 2009. It will be recalled that the helicopter was unable to be used for the spacer installation on the lower conductors due to proximity of the nearby lines.

[120] Exhibit D22 Nebo Electrical Induction Incident Investigation Report 13.10.08 7 of 10 recommendation 1.
[121] Exhibit D22 Nebo Electrical Induction Incident Investigation Report page 7 of 10- recommendation 2
[122] Exhibit D22 Nebo Electrical Induction Incident Investigation Report page 7 of 10- recommendation 2
[123] Exhibit D22 Nebo Induction Incident Investigation Report
[124] Exhibit D22 Nebo Induction Incident Investigation Report at page 8 of 10. Recommendations 7-9
[125] Transcript week 2, 1-39 at 42
[126] Exhibit E1.4 dated statement of Mr Ellem dated 14.12.2009.

Mr Sasse's initial reaction upon hearing of the fatality was outlined in an email sent to Mr Cipolla on 5 December 2009: "whatever the outcome the fact that the rescue relied on an external chopper is of grave concern"[127]. Notwithstanding the grave concern, the emergency response was not investigated by Mr Sasse. Mr Cipolla, in his response to Mr Sasse's draft report, raised the issue of the rescue and suggested "that an internal brains trust with a search and rescue expert about what possibilities exist that we might not have thought of"[128]. Mr Cipolla said in court that something like that did occur[129]. However the details, or extent of it is not clear and is not before the court.

Mr Sasse was asked at inquest if he questioned why a helicopter was to be used when a helicopter couldn't perform the task of installing spaces in that area of line. He said "…I didn't look in great depth at that issue, but I take your point that if you can't use a helicopter for fitting spaces you can't use a helicopter for rescue purposes unless someone, you know, has to suspend themselves beneath it or something".

When asked why it wasn't investigated in his report, Mr Sasse responded "my primary conclusion was that – that it was probably beyond the call of reasonably practicable to – to assume that the EWP would be completely disabled."[130]

It is the case that in this instance the EWP boom and bucket were not able to be operated via the normal computer controlled guidance system as the computer had failed from a probable excessive electrical force applied to the machine.[131]. The boom controls were still able to be actuated by an operator to raise or lower the boom if necessary[132]. An Engineer reviewed the EWP after the incident and reported that the computer guidance system was susceptible to failure due to voltage discharges on the vehicle, leaving workers stranded in the vehicle work basket until the emergency power system can be activated to allow the hydraulics to function and thus lower the basket[133].

Mr Appleby from Comcare didn't investigate this issue. When asked if he looked at the capability or limitations of a helicopter rescue, he said he didn't because he was focused on the cause of the incident and not more broadly on the deficiency or proficiency of a rescue[134].

The efficacy of the emergency response plan was relevant to the best prospect of an injured worker surviving. The failure of the plan to anticipate possible failure modes (a failure of imagination) and alternative rescue plans was a serious deficiency. Although it appears likely that the more effective rescue plan, if implemented appropriately, would not have saved Mr Cheney; he was entitled to a better prospect of survival.

The John Holland Investigation Revisited

Mr Sasse gave evidence at the inquest. It will be recalled his report found that the failure to comply with the AMS by not earthing the conductors to the towers prior was the main cause of the incident[135]. Mr Sasse found that "there may have been occasions in the past - not on this project - where employees had cut corners on earthing processes by effectively doing what Danny did on the day of the 5th and one of the recommendations of my report was that we should investigate further to establish to what degree that kind of activity was occurring or

[127] Exhibit D0 Statement of Mr Sasse dated 31.8.2016 at attachment 16.
[128] Exhibit D0 Statement of Mr Sasse dated 31.8.2016 at attachment 30
[129] Transcript week 2, 4-40 at line 40.
[130] Transcript week 1, 1-20 at line 10.
[131] Exhibit F1 Report of Patrick Meredith Down Engineers dated 29.1.10 page 8
[132] Exhibit F1 Report of Patrick Meredith Down Engineers dated 29.1.10 page
[133] Exhibit F1 Report of Patrick Meredith Down Engineers dated 29.1.10 page 10.
[134] Transcript week 1, 2-26 at 40
[135] Exhibit D1 Statement of Mr Sasse at page 34

had occurred and my understanding is that that recommendation was completed." Mr Sasse was referring to possible shortcuts taken at previous projects such as Mudgee and Nebo[136].

When asked if he investigated the earthing procedures in Mudgee, he responded that he couldn't investigate a job that was finished[137]. But there was the opportunity, as the court has demonstrated through its investigative process and many years later, to properly investigate those matters.

Mr Sasse made nine recommendations arising from his investigation[138]. The recommendations included the development of induced voltage and associated earthing procedures as well as making earthing subject to a Permit to Work process. He also recommended the use of a contact voltage detection instrument as part of the isolation process. The majority of recommendations were implemented prior to Mr Sasse completing and delivering the final report but not mentioned. Why? Mr Sasse said he knew "the review had taken place, which was a good thing, but… there's not a huge amount of value I can add to that process"[139].

Mr Sasse was asked if the post incident AMS was significantly different, he responded: *"It's, effectively, increasing the level of organisational supervision over the activity. So, for example, by making it permit to work that lifts it up, but the essential engineering effect doesn't change"*[140].

That statement is correct but a gross understatement of the true position.

Mr Sasse was questioned about his application of the Human Factors Analysis and Classification System. In his addendum report, he stated:

> "I used HFACS as a taxonomy to assist in classifying the behaviours which led to the incident – to remind me to ask questions that I might otherwise have missed. I viewed the HFACS as a guide, but did not take a doctrinaire approach to its application. I started by identifying that unsafe acts had occurred. I then considered each of the relevant categories of HFACS, including organisational influence, unsafe supervision and preconditions for unsafe acts. In hindsight, I accept that my report could have been more detailed in recording my consideration of each category. I did not specifically apply HFACS from a 'top down' or from the 'bottom up'. However, I used it as a guide to try, considering each level, to identify why the incident occurred."[141]

Further, Mr Sasse said:

> "In hindsight, my consideration of the cultural issues and acquiescence of the crew could have been further detailed in the report itself, not just within the recommendations. Also, I concede these factors could have been characterised in the report as 'preconditions for unsafe acts'. However, as a matter of substance, they were identified, considered and recommendations made to address them"[142].

It is obvious from the manner in which the report is written that Mr Sasse has had regard to the topics in the outline of the HFACS approach without following the logical progression of

[136] Transcript week 1, 1-28 at 45
[137] Transcript week 1, 1-27- at 2
[138] Exhibit D1 Statement of Mr Sasse at page 46 of 47 (of the document)
[139] Transcript week 2, 1-36 at 18.
[140] Transcript week 2, at 1-37 at 25
[141] Exhibit D0 Statement of Mr Sasse dated 31.8.2016 at page 21
[142] Exhibit D0 Statement of Mr Sasse dated 31.8.2016 at page 25

issues to be considered from bottom (the event sequence) to the top (upwards through the organisational factors relevant to events).

Conclusion - Comments, Findings and Recommendations

There are a number of factors that likely contributed to this fatal event.

Mr Cheney was a highly regarded employee who was newly promoted to the role of Construction Manager but initially worked as a Line Supervisor. He was new to the Strathmore Ross Project.

The original plan was for a helicopter to be used to install spacers on the conductors. Temporary earths in place during the stringing operation were removed as they were no longer required. However, it was discovered that the helicopter was unable to access the lower conductors adjacent to the live transmission lines and an alternative mode of installation was required. It was decided to use a conductor cart placed onto the conductors with the use of a EWP.

In the days prior to installation of the spacers, an Activity Method Statement was developed in consultation with Mr Cheney which required earthing of the conductors to the towers via the EWP before attaching the conductor cart.

On the morning of 5 December Mr Cheney had multiple responsibilities. As Stringing Supervisor, he conducted a meeting of 35 workers at 6.30am at the Ravenswood camp where he allocated work to crews. He was also leading his own work crew. They travelled to the Woodstock site office arriving after 7am and collected, amongst other things, the conductor cart and AMS. There was no discussion with his crew about the AMS, the work to be done or the required equipment. They left Woodstock about 9.15am, travelling to one tower, than another, before finding the spacers. It was about 10am when they arrived on site to start work. There was little or no preparation by Mr Cheney as supervisor or his work crew in anticipation for the work to be done.

It will also be recalled, by way of background, that the project was behind schedule and workers were soon to start leaving for the Christmas break.

There was no prestart meeting or attempt to perform a TRA with the benefit of the AMS. Mr Cheney appeared keen to progress work, taking on the key role of installing spacers from the cart. He likely felt the crew were late getting started.

The AMS was very detailed and the thought of this work crew breaking down the tasks even further, considering the hazards and control measures, would be a very time consuming activity to do on site. However, I acknowledge that if the AMS was shared with the crew with some discussion, one objective of the TRA, the crew would have been better informed about how the earthing should have been performed.

MR Cheney likely realised the crew did not have all of the equipment necessary to comply with the earthing procedure in the AMS. The crew required a hot stick as well as two split earthing leads, one for each end of the conductor span as well as a lead to bond the EWP to the conductor. Mr Cheney did not stop work and send a worker to retrieve the necessary equipment. It is clear from his decision to proceed with one hot glove and one riggers glove instead of two hot gloves, it was more important to continue with work.

Although it was clear Mr Cheney understood the risk of induction shock, I find it unlikely that Mr Cheney understood the magnitude of the risk associated with what he thought was an

alternative manner of earthing, namely to the EWP. He was a Stringing Supervisor/Construction Manager and a member of the group responsible for the development of the AMS. Mr Cheney was expecting the Project Engineer to be on site shortly and must have known it would be obvious to that Engineer he did not comply with the AMS. That apparently did not concern Mr Cheney and suggests Mr Cheney felt that he could justify his decision to deviate from the AMS as to the manner of earthing, clearly not understanding the risk he was about to take.

Those employees with qualifications in live transmission line work or professional qualifications in electrical engineering, fully appreciated the differences between earthing and bonding, when and why to apply each technique. It was clear from the evidence of those without such qualifications that there was heavy reliance on past experience without a sound theoretical foundation. Mr Cheney had no formal qualifications in live transmission line work. Mr Cheney was not trained in live transmission line work. HV construction work does not normally entail working with live transmission lines. Induction shock was a known hazard when working adjacent to live transmission lines. Mr Cheney may have received training about how to apply temporary earthing to the towers. However, this was likely in the context of working on towers and not from a EWP. It is also likely, that without formal training in this area, he did not appreciate the difference between earthing and bonding when working from a EWP on conductors, particularly when attaching a conductor cart. There is no evidence that the qualifications he held or the training provided by John Holland covered this issue.

The Comcare and John Holland investigations did not identify this subtle but important knowledge gap in the training of Mr Cheney. Indeed, both investigations asserted Mr Cheney was appropriately trained. The John Holland investigation acknowledged that there were reports of past inappropriate practices and 'short cuts' but did not seek to better understand how these arose. Similarly, the John Holland investigation report treated Mr Cheney decision to deviate from the prescribed procedure as a deliberate violation and excluded organisational factors as potential contributors. The recommendations in the report were essentially areas that were identified as warranting further investigation for opportunities to do better.

It is troubling to me that in parallel to the John Holland investigation, management identified immediate remedial action to ensure better supervision of earthing practices through a permit to work regime for earthing. It thereby ensured that the requisite knowledge and expertise (through the issuer of the permit) was introduced. Further, all workers got training on the basics of earthing and bonding, including the how and why. This was not mentioned, let alone acknowledged, in the John Holland investigation report.

The existence of a knowledge gap inevitably raises an issue about the adequacy of qualifications and training of workers, especially supervisors like Mr Cheney, relevant to working with induced current. This in turn raises issues with planning in the project, matching knowledge and skill of workers with the tasks to be performed. Or another way of saying it: Why didn't John Holland have in place the measures it introduced immediate after the death of Mr Cheney?

The previous Nebo incident was the opportunity to review all electrical hazards including tasks performed that exposed workers to induction shock, the need for formalised temporary earthing procedures and equipment, training on those procedures including why, supervision on compliance with those procedures, auditing for compliance by personnel from offsite, and development and training in emergency responses. The Nebo incident should have been the wake up call to John Holland, particularly given Mr Sasse's admitted knowledge about the less than satisfactory culture of the power industry and that division within John Holland.

Findings

1. On the morning of 5 December 2009 and adjacent to tower 323 on the Strathmore to Ross HV transmission lines near the Ross River Dam in North Queensland, Danny George Cheney died due to electrocution in the course of his employment with John Holland Group.
2. Mr Cheney was positioned in a conductor cart suspended from the conductors for the purpose of installing spacers. An Elevated Working Platform was used to raise, position and suspend the cart from the conductors. Mr Cheney had attached earthing leads between the EWP and conductors prior to attaching the cart. He was positioned in the cart and in the process of disconnecting the earthing leads when he was electrocuted.
3. In the days before the incident, Mr Cheney participated in the development of an Activity Method Statement which set out detailed procedures about how the spacer installation was to be performed including the requirement to apply temporary earths from each tower to the conductors.
4. Mr Cheney deviated from the requirement in the AMS, likely due to a number of operational factors but most importantly because of a gap in his knowledge about the difference between earthing and bonding, and the circumstances in which each is applied. Mr Cheney was exposed to different practises and procedures during his work with John Holland but had received no formal training on those matters. He had no formal qualifications that covered those matters.
5. Mr Cheney adopted what he thought was an alternative method of earthing, without adequate safety equipment and in an apparent desire to get the job done. The conductors were not effectively earthed and Mr Cheney was electrocuted.
6. The Comcare investigation and the John Holland investigation did not fully explore why Mr Cheney did not comply with the AMS and failed to identify the knowledge gap.
7. However, John Holland took immediate remedial action after the death to introduce a permit to work regime in respect of earthing, provided voltage detection equipment to check effectiveness of earthing, reviewed the AMS, and provided training to workers on earthing and bonding (the how and why).
8. For reasons that were not evident to me, the John Holland investigation report made no reference to the need for this remedial work or the fact that it was undertaken.

There are no matters about which I consider should be subject to recommendations directed at reducing the risk of a similar incident.

Kevin Priestly
Coroner
16 February 2018

Appendix

The scene showing the positioning of the Elevated Working Platform positioned under conductors moments before the incident

A closer image depicting Mr Cheney in the conductor cart and Mr Parungao in the Elevated Working Platform. Mr Cheney is unclamping and detaching the earthing lead from the conductor.