

- 6) That each of the 4 access permits issued by Mr Cook on the day in question had all been cancelled by Mr Cook, at the time he was removing the earth leads from pole 23. The power to the Low Voltage lines had come back on that morning.<sup>14</sup>

16. The relevant evidence from Mr Kreeck was as follows;

- 1) He is an "A" grade electrician.
- 2) That he was tasked with observing the work carried out by Mr Cook.
- 3) That Mr Cook was carrying out work on High Voltage wires. He was not sure if the low voltage wires were energised or not.<sup>15</sup>
- 4) That Mr Cook was in the process of removing the third earthing stick when he collapsed in the EWP. He did not see the stick hit the low voltage wires.<sup>16</sup>
- 5) That since this incident Thales does not permit any live line work at their facilities.<sup>17</sup>

## Conclusion

18. It is beyond the capacity of this inquest to know what was in the mind of Mr Cook in regard to his knowledge of whether he knew the low voltage (LV) wires were live or not.

19. There is insufficient evidence to conclude that the lines were re-energised by some one during the time that Cook was in close proximity to them in the EWP at around 2.10pm. The suggestion that Mr Mulquinney had told Mrs Cook at the hospital that he thought the low voltage power lines were off, was not something Mr Mulquinney could recall saying to her.<sup>18</sup>The issue was not pursued any further by any of the parties at the inquest.

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<sup>14</sup> T130

<sup>15</sup> Exhibit c7 Q58 and see T 171 pp29

<sup>16</sup> T 162 pp26

<sup>17</sup> T 220 pp20- 23

<sup>18</sup> T 98 pp6-9

20. Mr Mulquinney also stated that the words attributed to him by Mr Walker that he was heard on the radio saying "*we are coming back on line*", if said by him, were intended to pre-emptive, to alert staff that they may get alarms when the power is switched back on, and that they need to reset them. He maintained that the only person with the authority to switch the power back on was Mr Cook.<sup>19</sup> No evidence was adduced to refute this assertion.
21. Inferences drawn from his past experience and practices, do not provide definitive answers on this first issue. It is evident that Mr Cook was a highly competent and cautious individual and there was no evidence of risk taking behaviour in the work place. His attire on the day appeared to be suitable for the work to be undertaken, and there is insufficient evidence to find that his personal jewellery or clothing worn on the day, could give rise to a finding that he was unaware that the low voltage wires were live.
22. The position that Mr Cook was in during the process of removing the earthing sticks, with the low voltage wires passing in close proximity to his arm pits as described by the witnesses in this inquest, remains a concern.<sup>20</sup> Objectively, irrespective of whether Mr Cook knew or ought to have known the LV wires were live, to remove the earthing sticks, which were potential conductors, in such close proximity to the LV wires was inherently dangerous.
23. It is equally incongruous and difficult to reconcile the fact that one of the two observers who were tasked with observing the work of Mr Cook were not aware as to whether the LV wires were live or not.<sup>21</sup> Mr Mulquinney's evidence was that he assumed the LV wires were live.<sup>22</sup>
24. The evidence at this inquest indicates that the High Voltage (HV) wires Mr Cook was working on were de-energised. The 4 EAP's tendered in evidence at this inquest<sup>23</sup> do not appear to identify specifically whether the LV wires were energised. It is not possible to be

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<sup>19</sup> T 112 and 113 pp19-31 and 1-7

<sup>20</sup> T 183- 4 evidence of Kreeck and T 232 pp 9- 12 walker

<sup>21</sup> T 171 Kreeck pp 29-30

<sup>22</sup> T 89-90

<sup>23</sup> Exhibit C6

able to identify which of the 4 permits specifically relate to the pole that Mr Cook was working on at the time of the incident. Similarly, the EAP's do not appear to distinguish between high and low voltage power in terms of when the permit is issued and cancelled. For example does it follow that if a permit is cancelled that both high and low voltage power is returned at the same time?

25. The confusion arises because EAP 1 is issued at 7.00am and cancelled at 11.40am. EAP2 is issued at 11.14am and cancelled at 13.35pm, EAP 3 is issued at 11.30am and cancelled at 14.00pm and the un numbered EAP which I will take to be "4" has an issue time of 8.30am and was cancelled at 10.30am. Mr Cook was electrocuted at 2.10pm.
26. If these EAP's accurately represent when the power was switched off and on for both high and LV wires, then it follows that the HV wires Mr Cook was working on immediately prior to the incident according to the EAP's should have been live, yet we know they were not.
27. The EAP's tendered at the Inquest all point to the power being switched back on at the latest 1.35pm. Irrespective of which permit covered the pole Mr Cook was working on, the incident involving Mr Cook took place around 2.10pm.<sup>24</sup> It is difficult in these circumstances to have much confidence that there had been any correlation between the nature and timing of the work undertaken by Mr Cook and the paperwork ("EAP") which was produced and purported to accurately represent the sequencing of that work.
28. The difficulty in defining the precise sequence of events is compounded by the absence of switching instructions. Switching instructions according to Thales procedures at the time were to be in a written form.<sup>25</sup> The general sequence of switching to allow access shall include; removing all low voltage load from transformers; isolating the low voltage side of transformers; and restore supply where possible by closing alternate supply from other transformers or from stand by generators. These switching instructions are to be performed

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<sup>24</sup> T 205 pp1-110

<sup>25</sup> Exhibit AG- 1 to the statement of Andrew Gehrig ( page 37) see exhibit C18 also

by authorised HV electrical operators.<sup>26</sup>

29. Thales in submissions to the inquest confirmed that, *"No other documents held by it relating to the work conducted on 30 December 2008 that have not been provided to the Coroner"* Specifically there are no other EAP's or switching instructions that have not been provided to Thales Australia Ltd's knowledge"
30. Thales agrees that switching instructions for the work conducted on 30 December 2008 should have been prepared in accordance with its procedures and in their absence the work should not have been carried out.<sup>27</sup> Thales confirms that if a switching instruction had been prepared by either Mr Young or Mr Clements it would have been produced if Thales had possession of it.
31. In the absence of switching instructions, it is not possible to conclude that the power supply referred to by Mr Walker in his evidence as *"coming back on line"* was the same power that Mr Cook was working on. Nevertheless, if as Mr Walker asserts, that the power did come on, the question still remains, who turned the power on?, what part of the plant was it returned to?, was Mr Cook involved in this process?, and was there any switching instructions that authorised this act?.
32. On the current evidence, Mr Cook was the man responsible for turning the power back on as the authorised HV operator, and there was no evidence before the inquest that any other individual turned the power back on.
33. Mr Cook was obliged to treat the LV wires as live and to take universal precautions in their presence in the event that he was unsure as to their status.
34. If Mr Cook assumed the LV wires were de-energised, he nevertheless, ought to have taken the same universal precautions and treated them as live and conducted a risk assessment in accordance with that assumption.

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<sup>26</sup> Exhibit AG-1 statement of Andrew Gehrig Exhibit C18 6.2 ( page 32)

<sup>27</sup> Thales submissions dated 9 march 2012 page 18

35. Working in such close proximity to LV wires gives rise to the real potential for human or systemic error that can have tragic consequences. The human error is undertaking work on an incorrect assumption about the status of the surrounding conductors. The systemic error, is either not adhering to safety policies and guidelines, or alternatively those policies and guidelines providing for too much room for error in their procedures.
36. In this inquest, it has been found that Mr Cook complied with the necessary access permits and that the work was consistent with Industry codes of practice and the relevant industry standards. This conclusion has to be viewed both, in the context that no switching instructions have been produced to the Coroner to evidence the sequencing of returning power to the Thales facility, and the apparent inconsistency between what the EAP's recorded as the times of access and discontinuance, and the actual work being undertaken.
37. Whether Mr Cook's death was brought about by human error, be it his, or staff at Thales, or was the result of a broader systemic problem due to deficient protocols and guidelines, is not capable of a definitive answer on the evidence presented before this inquest.

#### **Other matters raised in correspondence from Mrs Cook**

38. There is no foundation for the criticism of the failure to call Mr Young to give evidence at the inquest, as no request from any party was made to the Coroner for him to give evidence. Equally, there is no substance to the suggestion that NSW workcover authority should have investigated the incident. Comcare has adequately investigated the incident and Mr Knop from Energy Safe Victoria reviewed the brief. No criticism was made by Mrs Cook or her legal representatives concerning the adequacy of the brief during the inquest.

#### **Comcare report**

39. A review of the equipment used by Mr Cook during the day of the incident was undertaken by Comcare.
40. The elevated work platform ("EWP") or cherry picker was inspected by engineers and its service history and construction was reviewed. The report from the engineers, which was

adopted by Comcare stated inter alia as follows;

1. The EWP is in a satisfactory condition and therefore was in a satisfactory condition at the time of the accident.
  2. The EWP has generally been maintained regularly and well, even though some items were identified for scheduled rectification.
  3. The EWP could have been upgraded partially to the requirements of the latest edition of AS1418(int) – 2004, however, if proper work practices were implemented and maintained, I doubt that these would have had any significant effect on the accident.
  4. An insulation test should be performed on the EWP before the unit is returned to service.
41. The earthing sticks were also checked and found to be two years outside the recommended testing period. There was no evidence however that the sticks were defective and this was not raised as an issue in the inquest.
42. The Comcare report found that Mr Cook possessed all the necessary qualifications and training to undertake the work that he was undertaking on the day of the incident.<sup>28</sup>
43. The report also found that Thales had provided adequate training in the use of the plant and associated equipment used by staff on the day. The report reviewed Thales High Voltage and Safety Policy and Guidelines.<sup>29</sup> The policy states that in regard to access authorities;

*“All access authorities shall only be issued by High Voltage operators and then only after appropriate precautions have been taken into account to ensure the safety of the work party”.*

*An electrical access permit (“EAP”), authorises an operator to infringe safe approach distances to High Voltage apparatus where the apparatus has been isolated*

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<sup>28</sup> Comcare report Thales Australia Limited Investigation no 4050 19 June 20009 p26

<sup>29</sup> Comcare report attachment 13 and 14

*and where possible earthed.*<sup>30</sup>

*Before any switching is performed, a detailed switching programme shall be prepared by an authorised High Voltage operator and checked (where possible) by another authorised High Voltage operator. All switching instructions shall refer to the electrical apparatus by name according to the attached nameplate.*<sup>31</sup>

### **Thales procedures**

- a. All access Authorities shall only be issued by HV operators and then only after appropriate precautions have been taken to ensure the safety of the work party.

- b. The access permit shall be clearly written with information logically grouped and contain the following;

Apparatus covered (name, location and nature of work)

Precautions taken including HV isolation, LV isolation, earthing ,other precautions and the warnings given to work party.

- c. The precautions to be taken include;

Warnings to be given to the work party. These will include a warning of adjacent alive apparatus, additional precautions to be taken by the operator or work party after the issue of the Access permit but before work commences. This may include additional earthing, barriers etc that cannot be safely erected by the HV operator prior to the issuing of the EAP.

- d. The issuing of the EAP;

The operator shall issue the EAP to the intended recipients verbally and physically indicating the following items:

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<sup>30</sup> Comcare attachment 15 and 16

<sup>31</sup> Comcare attachment 17

The precautions taken showing the location of the points of isolation and earthing

The limits of the EAP; and

The adjacent alive apparatus. This may be performed at the same time as indicating precautions taken;

To demonstrate understanding of the EAP the operator shall ask a minimum;

Do you understand the apparatus covered the limits of the EAP;

Are you satisfied with all the precautions taken

Are you aware of the nearest alive apparatus and satisfied you can remain clear of all alive apparatus during the performance of your work under the EAP.

Before any switching is performed a detailed switching programme shall be prepared by an authorised HV operator and checked ( where possible) by another authorised HV operator. The general sequence of switching to allow access shall include:

Removing all low voltage transformers

Isolating the low voltage side of transformers; and

Restore supply to plant where possible by closing alternate supply from other transformers or from standby generators.

44. Thales had also incorporated the Code of Practice of Electrical safety for Work on or near High Voltage Electrical Apparatus (the Blue Book) Victoria 2005 into its internal procedures. The book at **9.2.5.6** states that *all recipients shall be satisfied with the precautions taken, the location of points of supply, and the proximity of any adjacent live electrical apparatus.*



45. The uncontested evidence in this case is that Mr Cook was a suitably qualified and trained technician to carry out the work he was doing. Mr Cook undertook a risk assessment in accordance with Thales procedures and in accordance with the Blue Book. Mr Cook had completed the necessary Electrical Access Permits.<sup>32</sup>

**The appropriateness of State and National standards and protocols regarding the work undertaken by Mr Cook at the time of his death.**

43. The practices and procedures relating to working on high and low voltage electrical apparatus at the time of the incident on 30 December 2008 were contained in a document titled "*High Voltage Safety policy and Guidelines for Thales Australia Mulwala Facility (HV guidelines)*". These procedures were to be read in conjunction with the code of Practice on Electrical Safety for Work on or near HV Electrical Apparatus (Vic). ("The Blue Book")<sup>33</sup>.

44. The relevant portions of that book which had been incorporated into the Thales guidelines were principally;

9.2.5.6 All recipients shall be satisfied with the precautions taken, the location of the points of supply, and the proximity of any adjacent *live electrical apparatus*.

46. The report from Comcare and the evidence from the author at the Inquest concluded that there had been compliance by Thales and by Mr Cook with the guidelines contained in both Thales Guidelines and the Blue Book.<sup>34</sup>

47. As it presently stands if an "authorised person" makes an appropriate risk assessment in regard to work to be conducted in the proximity of live low voltage wires, that is sufficient for there to be compliance with many State and National standards.

48. This would be the case even now where workers working in similar circumstances to Mr Cook can be at risk. The difference between life and death could be a matter of millimetres.

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<sup>32</sup> Exhibit C6

<sup>33</sup> Exhibit C-16

<sup>34</sup> Transcript (T) p 259 and 260 and see 266 pp13

49. Evidence was received at the Inquest from Mr Warren Knop an enforcement officer with Energy Safe Victoria.<sup>35</sup>

50. Mr Knop's evidence was that the same procedures employed by Thales and by Mr Cook would be employed in Victoria.<sup>36</sup> He did state however that in Victoria:

*"Where possible, the LV lines would be taken out (of) service to facilitate the work being undertaken on the HV lines above. Where the LV lines remain alive they may be covered with insulating mats or other material to prevent inadvertent contact. That information would be described in the access permit".*

### **Switching procedures**

51. In evidence at the Inquest, it was confirmed that it was Mr Cook's responsibility to satisfy himself as to whether or not the low voltage conductors were live, and in the event that he did not know whether they were live or not to treat them as live.<sup>37</sup>

52. Mr Cook as the authorised person was responsible for the preparation of any switching instructions required by the nature of the work he was carrying out. No switching instructions were located in regard to the work undertaken. This may have been due to the fact that Thales procedures required any such switching to be signed off by a second high voltage operator, and the evidence was that of the three HV operators at Thales, none were working that day, so presumably it was not done.

53. Nevertheless, Thales accepts that switching instructions for the work conducted on 30 December 2008 should have been prepared in accordance with (it's) procedures and in their absence should not have been carried out.

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<sup>35</sup> See exhibit C14

<sup>36</sup> T 365 and 366

<sup>37</sup> T 398 pp 3-12

## Recommendations from Comcare and Energy Safe Victoria

### Comcare

54. The report by Comcare made two recommendations;

- a) That Thales ensure that all electrical equipment is regularly inspected and tested, in accordance with Australian/New Zealand Standard AS/NZ 3760. The standard provides Thales with practical guidance on the inspection requirements and testing methods for electrical equipment used at the workplace.
- b) That Thales review the processes involved, when conducting maintenance/repairs on HV and LV power lines. Unless imperative, I recommend that these works being performed on only de-energised power lines.

### Energy safe Victoria

55. No formal recommendations were contained in the statement tendered to the Inquest from Mr Knop an inspector from Energy Safe Victoria (“ESV”). He did however have the opportunity to review the facts in this case and made the following comments;

- a) In Victoria, where possible, the LV lines would be taken out of service to facilitate the work being undertaken on the HV lines above. Where the LV lines remain alive they may be covered with insulating mats<sup>38</sup>
- b) The placing of the earth sticks in the insulated EWP removed it’s insulating capacity , which is normally against procedure, because it creates a clear path to earth and exposes the worker to a clear hazard.<sup>39</sup> The general process is to secure them either to the pole or on the cable that they are attached to.<sup>40</sup>

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<sup>38</sup> Exhibit C14 p 6 and T 368

<sup>39</sup> T378-9

<sup>40</sup> T381

- c) That appropriate clothing be worn including long sleeve shirt and trousers.<sup>41</sup>

### **Remedial work undertaken by Thales**

56. Since this incident Thales has informed the Inquest that it has implemented a number of “enhancements to it’s OHS practices and procedures”. Those changes include;

- a) Thales has removed all exposed conductors (with one exception) and replaced them with insulated aerial bundled cable.<sup>42</sup>
- b) The previous High Voltage Safety policy and Guidelines for Thales Mulwala facility has been replaced a document entitled Standard System Procedure TA00480 High Voltage Safety Procedure, Issue3.<sup>43</sup>
- c) All electrical employees have been trained in the revised and new procedures and are required to acknowledge that they are conversant with the new codes of practice.<sup>44</sup>
- d) The new formatted EAP now requires cross referencing to the switching number that has been prepared.<sup>45</sup>

### **Report from the Coroners Prevention Unit (“CPU”)**

57. A report was commissioned by the Coroner from the Coroners Prevention Unit (“CPU”), specifically on electrical work carried out near live overhead power lines. The report was intended to assist the Coroner, and does not form part of the evidence in this inquest.

58. The statistics obtained from the Electrical Regulatory Authorities Council (ERAC) show that 25% of total electrical fatalities involve electricity workers and supply workers.

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<sup>41</sup> T 390

<sup>42</sup> T 408

<sup>43</sup> T416

<sup>44</sup> Thales submissions 9 March 2012 p 15

<sup>45</sup> Ibid p 16

The ERAC reported that the most common deaths associated with electricity supply networks were the result of working on or near energised overhead conductors. Of a total 65 deaths involving electricity supply networks in the seven year period, (2001- 2008) 61 (94%) were due to contact with energised overhead conductors.<sup>46</sup>

59. This is an alarming statistic, that probably bears greater scrutiny. In a perfect world it is 65 deaths too many. The reality of the circumstances of Mr Cook's death indicate that if the LV wires had been de energised he would still be alive today. Had rubber matting been employed, over the LV wires proximate to where Mr Cook was working, and had he not placed the earthing leads in the EWP he may have been able to continue his work.<sup>47</sup>

## FINDINGS

- A. That Mr Cook was electrocuted during the course of carrying out maintenance work for his employer Thales.
- B. That there is insufficient evidence to find that Mr Cook was unaware that the Low Voltage wires that he was working in the vicinity of were energised. In any event the conductors ought to have been treated as energised and appropriate precautions undertaken.
- C. That there is insufficient evidence to find that the Low Voltage wires were inadvertently re-energised by persons unknown during the maintenance work carried out on pole 23 by Mr Cook.
- D. That Mr Cook was the responsible person for the safety assessment carried out prior to the maintenance work being undertaken. The work was carried out in accordance with Thales workplace requirements and were compliant with existing State and National guidelines.

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<sup>46</sup> CPU report CPU 0158/2010 dated 16/09/2010 p8

<sup>47</sup> T 401 pp14-18 Knop

## COMMENTS

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

1. Thales have undertaken a review of their procedures and guidelines and have as a result of the death of Mr Cook, implemented a number of changes to their work practices in regard to electrical maintenance work .
2. These initiatives ought to be condoned and encouraged as they inevitably will bring about a safer work environment for their electrical workers.
3. It is lamentable that the electrical switching documentation has either not been undertaken or been lost, and as such was not able to be produced at the inquest. Many of the questions posed by Mr Cook's widow could have been answered had the documentation been brought to light. It should be noted however, that this issue was not pursued with any vigour at the Inquest and no criticism of any one individual is warranted.
4. Work should only be conducted in close proximity to live conductors where there is no viable alternative available. It should be mandatory for the person charged with assessing the safety risk to state they have considered all viable alternatives in the EAP. If work is to proceed in close proximity to energised conductors, safety mats should be used to cover the conductors. If the mats are not utilised, then the safety assessor should state in the EAP why they have not been used.

5. Switching instructions should form part of the same document produced for an EAP. This would reduce or eliminate the instructions being misplaced, or for miscommunication to occur. Achieving prior consensus on the nature of the work and the risks involved, and a clear understanding of the sequencing involved in electrical work by all staff involved is paramount.

## RECOMMENDATIONS

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

That Energy Safe Victoria, in conjunction with the national Electrical Regulatory Authorities Council, review existing electrical safety legislation, standards and guidelines to consider:

1. Mandating that electrical work in close proximity to live conductors only be undertaken when no viable alternative is available;
2. Mandating that electrical work in close proximity to live conductors only be undertaken when insulating mats or another sufficiently protective method are used to prevent contact with the conductors;
3. Requiring switching instructions to be incorporated into the same document produced for an Electrical Access Permit when work is to be conducted in close proximity to high or low voltage lines; and
4. Mandating that when electrical work in close proximity to live conductors is to be undertaken, that details of the consideration to all possible alternatives is documented in the Electrical Access Permit.

Signature:

Gerard Robert Bryant

Coroner

Date: 11 October 2012



A handwritten signature in black ink, appearing to read "Gerard Robert Bryant", is written over a horizontal line. A long, sweeping horizontal stroke extends from the end of the signature across the page.

