IN THE CORONERS COURT
OF VICTORIA
AT MELBOURNE

Court Reference: COR 2009 4103

# FINDING INTO FIRE WITH INQUEST[1]

*Form 39 Rule 61(1)*
*Section 68 of the* ***Coroners Act 2008***

**Inquest into the Fire at: Il Gambero Restaurant**

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| Distributed On: | 23 November 2015 |
| Hearing Dates: | 3 November 2011, 6 February 2012, 21 March 2012 and 13 August 2012 |
| Finding of: | AUDREY JAMIESON, CORONER |
| Appearances: | Mr John Murphy on behalf of Energy Safe Victoria |
| | Ms Catherine Dunlop on behalf of the Metropolitan Fire Brigade |
| Counsel Assisting | Leading Senior Constable Remo Antolini, Police Coronial Support Unit |

[1] The Finding does not purport to refer to all aspects of the evidence obtained in the course of the investigation. The material relied upon included statements and documents tendered in evidence together with the transcript of proceedings and submissions of legal representatives and counsel. The absence of reference to any particular aspect of the evidence, either obtained through a witness or tendered in evidence does not infer that it has not been considered.

I, AUDREY JAMIESON, Coroner having investigated the fire at **IL GAMBERO RESTAURANT**
AND having held an Inquest in relation to this fire on 13 August 2012
at the Coroners Court of Victoria at Melbourne
find that the fire occurred on 19 August 2009
at 221 Lygon Street, Carlton VIC 3053
and that the origin of the fire was: on the base shelf of the staff service counter, where an electrical portable outlet device (hereafter referred to as 'power board') and other electrical appliances were located
and that the cause of the fire was: either the power board or an appliance connected to the power board at the time

in the following circumstances:

1. On 19 August 2009, a fire occurred at Il Gambero restaurant, causing extensive fire, heat and smoke damage to the building.

## BACKGROUND AND CIRCUMSTANCES

2. At the time of the fire,[2] Il Gambero was an Italian restaurant facing east onto Lygon Street in Carlton. The building was double storey and comprised of solid brick external walls, timber stud internal walls, a corrugated iron roof, fibrous plaster ceilings and majority timber flooring (some coverings also carpet and tile).[3] The lower level of the restaurant comprised tables and chairs seating up to 90 people, a pizza oven and service counter to the right, a kitchen at the rear and a separate bar and dishwashing area. The upstairs area comprised toilets, a storeroom, change room, cooler room and freezer.[4]

3. At approximately 11.00pm - 11.30pm on 19 August 2009, Il Gambero restaurant manager Anthony Ierna closed the restaurant. He was the last person to leave.[5] At approximately 11.52pm emergency services were notified of a fire at Il Gambero restaurant.[6] The

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[2] Il Gambero restaurant has since moved locations.

[3] Melbourne Fire Brigade Fire Investigation & Analysis Report of Station Officer Rod East into the fire at Il Gambero restaurant, Inquest brief, 4, Exhibit 5.

[4] Exhibit 5, Statement of Anthony Ierna, dated 2 November 2011, Inquest brief, 1.

[5] Exhibit 5, Statement of Anthony Ierna, dated 2 November 2011, Inquest brief, 1.

[6] Exhibit 5, ESTA call history, Call No: 5565 of August 2009, Inquest brief, Appendix 1, 16.

Metropolitan Fire Brigade ('MFB') attended the scene shortly thereafter and extinguished the fire.

## INVESTIGATION

### MFB Investigation

4. The MFB investigated the fire at 7.00am on 20 August 2009, resulting in MFB Station Officer ('SO') Rod East compiling a Fire Investigation Report.

5. At the time of the fire, Il Gambero was locked and secured. The building sustained heat and smoke damage to all walls and the roof. The fire did not affect areas to the rear and second level, but had penetrated the roof space, due to the exhaust flues that passed through the floors and exited out of the roof. The heat and smoke from the fire affected most of the ground floor and the entire building was subjected to heat and/or smoke.[7]

6. The fire was contained to the south end of the ground floor. SO East reported that the fire was able to develop to extreme temperatures as a result of the double and triple brick walls, the density of the timber cladding, on the walls and across the ceilings, and the timber flooring between the levels trapping the heat.

7. SO East reported the area that sustained the greatest fire damage was adjacent to the electric pizza oven, at the end of the main counter, which ran east/west for approximately five metres. Approximately one metre beyond the pizza oven was a staff service counter, which comprised a bench top and inner shelves used for storage of items including, but not limited to menus, brochures, register rolls and napkins. On top of the counter were two computer stations with additional items including, but not limited to an Eftpos machine, printer and fax machine and card scanner; all which were powered via a multi-outlet power board that was connected to a single power outlet. SO East reported that the power board had been located on the lower shelf and appeared to have been covered and encased by many of the items stored on the shelf. All power board outlets were in use at the time of the fire. [8]

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[7] Exhibit 5, Melbourne Fire Brigade Fire Investigation & Analysis Report of Station Officer Rod East into the fire at Il Gambero restaurant, Inquest brief, 5-6.

[8] Exhibit 5, Melbourne Fire Brigade Fire Investigation & Analysis Report of Station Officer Rod East into the fire at Il Gambero restaurant, Inquest brief, 7.

8. SO East reported that the area near the staff service counter had been extensively fire damaged, with the ceiling overhead and adjacent brick wall severely fire affected. The burn pattern on the sides of the adjacent electric pizza oven indicated back to the area where the staff service counter was positioned. The bench top and internal shelves had all sustained heavy fire charring and had collapsed inwards, and the under sides had sustained 'heavy alligator charring', indicating the fire occurred on the under side. Excavation of this area revealed that the lowest burn pattern was on top of the base shelf of the staff service counter. Located at this point were the remains of a four-outlet power board that had been consumed by the fire from the base upwards. SO East reported this to be the area of origin of the fire. The power board was located within various paper and plastic items. Examination of the remains of the power board indicated that it was heavily fire affected and that there were electrical arc marks and oxidisation to the internal components, indicating that it was in operation prior to the fire.[9]

9. SO East reported that with the information contained within his report and the exclusion of all other ignition sources, he classified the fire as 'electrical' and concluded that the cause of the fire was attributed to the unspecified electrical failure of the power board.[10]

**Energy Safe Victoria Investigation**

10. Section 7(f) of the *Electricity Safety Act 1998* (Vic) enables Energy Safe Victoria ('ESV') to investigate events or incidents that have implications for electrical safety. On 30 January 2012 ESV Equipment Safety and Efficiency Manager Adam Murdoch undertook an examination of the evidence retrieved by SO East and compiled an Observation of Electrical Equipment Report.

11. In relation to examination of the power board, Mr Murdoch reported that the power board was substantially more damaged towards the end not containing the overload circuit breaker and cable entry. At that end, the casing was completely exhumed, revealing the ends of three internal busbars up to a point just past the end socket receptacles. No arc marks or evidence of abnormal electrical activity were found on the conductors. The busbars and inlet receptacles

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[9] Exhibit 5, Melbourne Fire Brigade Fire Investigation & Analysis Report of Station Officer Rod East into the fire at Il Gambero restaurant, Inquest brief, 7-9.

[10] Exhibit 5, Melbourne Fire Brigade Fire Investigation & Analysis Report of Station Officer Rod East into the fire at Il Gambero restaurant, Inquest brief, 12.

also showed no sign of arc marks or abnormal electrical operation. Breaks/frays to the conductor strands could not be attributed to arcing and were reported to be more likely due to mechanical damage during the fire and initial scene excavation.

12. Inspection of the 10A circuit breaker revealed that it was still intact and was in the closed position. Testing on the circuit breaker revealed that at 16A the circuit breaker operated in 28 seconds and that at 13A it operated within two minutes. The power board over current was still operational and did not trip during the fire.

13. Mr Murdoch reported that it was difficult to draw comprehensive conclusions from the findings, as ESV was not involved in the initial on-site investigation, however it is unlikely that the examined power board was the ignition source of the fire.[11]

## JURISDICTION

14. At the time of the Il Gambero fire, the *Coroners Act 1985* (Vic) ('the old Act') applied. From 1 November 2009, the *Coroners Act 2008* (Vic) ('the new Act') has applied to the finalisation of investigations into deaths and fires that occurred prior to the commencement of the new Act.[12]

15. In the preamble to the new Act, the role of the coronial system in Victoria involves the independent investigation of deaths and fires for the purpose of finding the causes of those deaths and fires and to contribute to the reduction of the number of preventable deaths and fires and the promotion of public health and safety and the administration of justice. Reference to preventable fires and public health and safety is found in other sections of the new Act.[13]

## PURPOSE OF THE CORONIAL INVESTIGATION

16. The primary purpose of the coronial investigation of a fire is to ascertain, if possible, the cause and origin of the fire and the circumstances in which the fire occurred.[14]

17. Coroners are also empowered to report to the Attorney-General on a fire they have investigated and are empowered to make recommendations to any Minister, public statutory or

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[11] Statement of Adam Murdoch, Equipment Safety and Efficiency Manager, ESV, dated 30 January 2012.
[12] *Coroners Act 2008* s119 and Schedule 1.
[13] See *Coroners Act 2008* (Vic) s 72 (1) & (2).
[14] *Coroners Act 2008* (Vic) s 68.

entity on any matter connected with the fire, including recommendations relating to public health and safety or the administration of justice.[15] This is referred to as the 'prevention role' of the coroner.

18. I note that historically, under the old Act, a coroner was obliged to make a finding regarding contribution. In 1999 the old Act was amended to remove this obligation. The absence of this obligation was preserved in the new Act, and is supported by the common law, which maintains that it is not part of a Coroner's role to lay or apportion blame.[16] However, the removal of the obligation does not preclude a coroner from making a finding of contribution, in appropriate cases.

19. The *Briginshaw*[17] standard of proof is applicable to findings of fact in this Court. As Dixon J espoused:

> The seriousness of an allegation made, the inherent unlikelihood of an occurrence of a given description, or the gravity of the consequences flowing from a particular finding are considerations which must affect the answer to the question whether the issue has been proved to the reasonable satisfaction of the tribunal. In such matters 'reasonable satisfaction' should not be produced by inexact proof, indefinite testimony or indirect inferences.[18]

**POWER BOARD RELATED MATTER**

20. On 26 December 2009, 12-year-old Timothy Voigt (hereafter referred to as 'Tim') tragically lost his life in a house fire, in circumstances where a multi-outlet power board was located at the origin of the fire, and where the cause of the fire was either the power board or an appliance connected to the power board.

21. The common threads linking these matters were as follows:

    a. Multi-outlet power boards were located at the origin of both fires;

    b. The cause of both fires was either a power board or an appliance connected to the power board; and

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[15] *Coroners Act 2008* (Vic) ss 72(1), 72(2).

[16] Keown v Kahn (1999) VR 69, 76 per Callaway JA.

[17] *Briginshaw v Briginshaw* [1938] 60 CLR 33.

[18] *Briginshaw v Briginshaw* [1938] 60 CLR 33 [362]-[363].

c. The power boards were being inadvertently misused at the time of both fires.

22. I determined that both the death of Tim and the Il Gambero fire warranted the exercise of my discretion, pursuant to sections 52(1) and 53(1) of the new Act, to hold Inquests. The investigations into the death of Tim and the Il Gambero fire identified similar features including matters related to public health and safety, and I accordingly determined that there was utility to collectively addressing these similarities and collectively exercising my role to contribute, where possible, to the reduction of preventable deaths and fires. I consequently made a determination to hold an Inquest into the death of Tim and the Il Gambero fire, pursuant to section 54 of the new Act.

## INDEPENDENT EXPERT REPORT OF RUSSELL LEE

23. An independent expert report was sought from Russell Lee, a consulting forensic electrical and mechanical engineer, in relation to multi-outlet power boards generally and in response to specific questions I requested that he address.[19] I have considered this report for the purpose of this Finding.

## THE EVIDENCE

24. This finding is based on all the investigation material comprising the coronial brief of evidence, all material obtained after the provision of the brief, the statements and evidence of those witnesses who appeared at the Inquest and any documents tendered through them, other documents tendered through counsel, and submissions made by counsel.

25. The following witnesses gave *Viva voce* evidence at the Inquest:

    a. Mr Ian HUNTER, Manager of the MFB Fire Investigation Analysis Unit;

    b. Mr Roderick EAST, Station Officer at the MFB Fire Investigation Analysis Unit;

    c. Mr Russell Lee, Consulting Forensic Electrical and Mechanical Engineer and Independent Expert;

    d. Mr Adam Murdoch, Manager of Equipment Safety and Efficiency at ESV;

    e. Mr Neil Fraser, Electrical Installations, Licensing and Equipment Safety Executive Manager at ESV; and

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[19] Exhibit 6, Independent expert report of Russell Lee, dated 31 March 2011, Report No. 2010 065-1R, Expert opinion brief, 89.

f. Mr Goran Sokoleski, Compliance Officer at ESV.

## ISSUES INVESTIGATED AT INQUEST

26. Issues were identified that required further exploration at Inquest, including:

    a. The origin of the fire;

    b. The cause of the fire;

    c. Limitations and risks associated with the use of power boards;

    d. The Australian/New Zealand Standards in relation to power boards; and

    e. Whether some power boards are safer than others.

27. There had been some disagreement between various witnesses prior to the Inquest in relation to whether I should accept the MFB's conclusions about the cause and origin of the fires. There had also been some disagreement in relation to limitations and risks associated with power board misuse. This led to the witnesses meeting prior to inquest, discussing these issues and developing a joint report.[20]

28. At Inquest, the witnesses gave concurrent evidence in relation to the conclusions formed in the joint report.

### Origin of the fire

29. All expert witnesses agreed that the origin of the fire was on the bottom shelf where the power board and other electrical devices were located.[21]

### Cause of the fire

30. All expert witnesses agreed that the cause of the fire was either the power board or an appliance that was connected to the power board at the time. This conclusion was formed as a result of the fire scene examination and information provided by building occupants.[22]

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[20] Exhibit 1, Joint report of Mr Murdoch, Mr Lee, Mr Hunter, Mr East and Mr Fraser, dated 9 August 2012.

[21] Exhibit 1, Joint report, 12; Transcript, 107.

[22] Exhibit 1, Joint report, 12; Transcript, 107.

## Limitations and risks associated with the use of power boards

### *Intended Use*

31. A power board is a block of two or more electrical socket outlets that allows multiple electrical devices to be powered from a single electrical socket.[23] It is designed 'for temporary use and not for permanent installation'[24] and is generally rated at a maximum total current of 10A for all outlet sockets combined.[25]

### *Misuse and its effect on power boards*

32. All expert witnesses agreed that power boards are most commonly misused due to the public not understanding, or being unaware, that they are misusing power boards.

33. ESV noted that a limited survey of two of an estimated seven suppliers has shown that in the five years up to 2012 the two companies supplied 8.5 million power boards Australia-wide. The average number of failures in the Melbourne metro district that resulted in fire service attendance was approximately 16 per year.[26]

34. Although the cause of the fire in this matter has not been definitively attributed to a power board, the *possibility* that it may have been the cause compels me to investigate the safety of power boards, as it is a matter connected with the circumstances surrounding Tim's death and the Il Gambero fire and is a matter related to public health and safety.[27]

35. Within the joint report a number of examples of inadvertent misuse were identified,[28] some of which were contested, including:

    a. Overloading power boards;

    b. Outdoor use;

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[23] Exhibit 1, Joint report, 1.

[24] A/NZ Standard 3105 2007, Scope, 1.1; Transcript, 48, 129.

[25] Exhibit 6, Independent expert report of Russell Lee, dated 31 March 2011, Report No. 2010 065-1R, Expert opinion brief, 51, 55.

[26] Exhibit 1, Joint report, 2.

[27] See *Coroners Act 2008* (Vic) s 72 (2).

[28] All of the examples of inadvertent misuse listed within paragraph 35 of this finding were canvassed at Inquest. However, I will only address the examples of misuse relevant to the circumstances surrounding the death of Tim and the Il Gambero fire.

c. Cocooning power boards;

d. Damaged power boards being repaired by home handymen;

e. Piggy-backing of power boards; and

f. Contamination.

Overloading power boards

36. All expert witnesses agreed that power boards are generally limited in current rating to a maximum of 10A and that the limitation is regardless of how many outlets are on the power board. Within the report, there was general agreement that 'people may be unfamiliar with this limitation and may connect loads which may exceed the current rating'.[29] Mr Fraser gave examples of a standard kettle using approximately 8-10A for a very brief length of time, a fan using approximately 10A and a bedside lamp using less than one fifth of 1A. He said that a power board fitted with a 10A lead and overload could not run two appliances such as two kettles, however may be able to run up to 50 bedside lamps, if there were enough outlets.[30]

37. The Australian/New Zealand ('AS/NZS') Standards are governed in Australia by Standards Australia, the nation's peak non-government Standards organisation charged to meet Australia's need for contemporary, internationally-aligned Standards and related services. Standards are published documents setting out specifications and procedures designed to ensure products, services and systems are safe, reliable and consistently perform the way they were intended to. They establish a common language which defines quality and safety criteria.

38. AS/NZS Standards mandate that power boards with three or more outlet facilities must incorporate an over current/thermal overload protection device. The MFB submitted that even though this device is fitted, the setting of the device permits an overload condition to persist for a significant time and at a significant level. ESV tendered a report titled 'Electrical portable outlet device temperature rise tests and comparisons'[31]. The report showed that during testing the over-current cut out of an uncovered power board loaded with a resistive load of 13.75A cut out after 1 minute and 48 seconds. The power board was then loaded with a resistive load of 12A and the overload cut out after 6 minutes. The power board was then

[29] Exhibit 1, Joint report, 1.

[30] Transcript, 18.

[31] Exhibit 2, ESV electrical portable outlet device temperature rise tests and comparisons, 313.

loaded with a resistive load of 11A. The temperatures were measured and steady conditions were established after 45 minutes, at which point the amps were increased to 11.5A. Steady conditions were established after 25 minutes and the current was increased to 12A, resulting in the overload cut out operating immediately at this current loading.[32] For a power board to comply with AS/NZS Standard 3105:2007 ('AS/NZS 3105 Standard') at 13.75A the power board would have to trip within two hours, therefore testing results were within the AS/NZS 3105 Standard.[33]

39. Mr Hunter raised concerns that the propensity for overloading is increasing with the increase in the use of electrical appliances, that individuals are interfering with the overload device to avoid an overload cut out and that the Standard does not endeavour to foresee issues such as how well a power board will meet the standard 5-10 years down the track when the power board has been constantly used, exposed to age, damage, component deterioration and degradation of materials.[34] Mr Fraser submitted that the AS/NZS Standards do try to foresee wear and tear and that contact pressures of new power boards are tested to ensure that they still remain at those contact pressures at the end of 1000 cycles.[35] However, this testing is only conducted on new power boards.

Cocooning power boards

40. MFB evidence from the Il Gambero fire suggests that the power board had been covered and encased in a number of items stored on the shelf it was located in, including various paper and plastic items.[36] Consequently, I have investigated the inadvertent misuse of cocooning.

41. Within the above-mentioned ESV report,[37] tests were also conducted in circumstances where a power board loaded up to 10A was covered (otherwise known as 'cocooned') with various items[38] and was measured for temperature while uncovered and covered. The report concluded that from all of the measuring points required by the AS/NZS 3105 Standard, the external

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[32] Exhibit 2, ESV electrical portable outlet device temperature rise tests and comparisons, 327.

[33] Transcript, 25-6.

[34] Transcript, 33, 132.

[35] Transcript, 34.

[36] See Paragraph 7-8 of Inquest into the fire at Il Gambero restaurant: COR 2009 4103.

[37] Exhibit 2, ESV electrical portable outlet device temperature rise tests and comparisons.

[38] Cotton rags, a woollen blanket, a doona and a blanket and doona; See exhibit 2, ESV electrical portable outlet device temperature rise tests and comparisons, 315.

temperatures of the power board were within the limits, however the temperature of the active and neutral terminal of the socket were exceeded.[39] Mr Sokoleski advised that the standard is based on an uncovered power board and, although temperatures were exceeded, the test was not covered by the Standard as it was a cocooned power board. However, the effects of power board cocooning was tested as it was something that ESV wanted to investigate. Mr Sokoleski was not concerned that the temperature went above the Standard when the power board was cocooned, as the maximum temperature for plastic is 100 degrees Celsius and the maximum temperature that the cocooned power board reached was 78 degrees Celsius.[40]

42. The MFB did not dissent with the ESV tests undertaken by Mr Sokoleski and agreed that for fire research purposes it creates a 'very good benchmark' as something that can be measured against. Mr Hunter stated that the MFB's concern was that all testing was done in a 'laboratory type situation', which was appropriate for a bench mark test, but did not account for age, general possible damage to power boards, service life and possible contamination.[41] He raised concerns that the change of state occurs in the natural life of a power board which is why the MFB have concerns about cocooning in the actual environment the power board is operating in:

> The materials, the density, the quantity and just the general fact that if it is not seen, if it's hidden, it's tended to be forgotten and due diligence about care and maintenance of that device seems to disappear.[42]

43. Mr East added that the products around the power board may change over time, occupants may have forgotten about it or neglected to look at it, there may be denigration of the plastics, the fire rating in the plastics might change and the denigration of the products that are actually cocooning it will change.[43]

44. Mr Murdoch agreed that cocooning of any electrical equipment would inhibit its operation, increase its temperature rise and if you were to leave the power supply in the same condition you could reasonably expect that their characteristics would also change. However he stated

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[39] Exhibit 2, ESV electrical portable outlet device temperature rise tests and comparisons, 315.

[40] Transcript, 22.

[41] Transcript, 23.

[42] Transcript, 37.

[43] Transcript, 38.

that in normal operation, power boards are less likely to get hot. Mr Hunter agreed that cocooning of electrical appliances in general could increase the potential and propensity for a fire.[44]

Piggy-backing of power boards

45. In her statement to Victoria Police, Ms De Voigt stated that both power boards involved in the Cranbourne fire may have been piggy-backed (also known as 'daisy chained') with an extension lead that was plugged into a second power board.[45] Although Ms De Voigt's evidence was not confirmed or corroborated by the fire investigators, as a matter of caution I have addressed the misuse of piggy-backing power boards.

46. The ESV submitted that piggy-backing of power boards has limited effect on the operation of the power boards, as shown in the test results outlined in the ESV report titled 'Voltage drop Vs Cable Length Testing and Comparison', revealing that piggy-backing power boards do not introduce an additional voltage drop when compared to a standard extension cord.[46] The tests were done using new power boards.

47. Mr Lee raised concerns that in power boards with worn contacts or boards that have been subjected to some form of misuse or abuse the conditions change, and fair wear and tear and usage over time is likely to expose the power board to problems.[47]

Contamination

48. Mr East submitted that contaminants, such as dust and other debris, do get into power boards and start fires. Possibilities to reduce contamination were discussed at Inquest, such as positioning power boards vertically to reduce the amount of contaminants entering the outlets and building spring loaded shutters into the outlets. Mr Murdoch accepted that contamination in a power board may affect the quality of the power board, however stated that testing would need to be conducted to confirm this, and stated that he would feel uncomfortable

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[44] Transcript, 38-9.

[45] Exhibit 4, Statement of Donna De Voigt, dated 14 January 2010, Inquest brief, 17; Exhibit 4, Report of Russell Lee, consulting forensic electrical and mechanical engineer, Inquest brief, 95.

[46] Exhibit 2, ESV report titled 'Voltage drop comparison of cord extension sets and EPODs', Expert Report brief, 333.

[47] Transcript 50-1.

recommending how to position a power board without tests providing confirmation that contamination affects the quality of power boards.[48]

**Australian/New Zealand Standards**

49. It is an offence in Victoria and other Australian States and Territories to supply or offer to supply 'prescribed' classes of electrical equipment unless it has been approved by a regulatory authority. ESV lists power boards as prescribed electrical equipment. Manufacturers of power boards intended for sale in Victoria require a certificate of approval for the particular product design. As part of the application process, a test report is compiled from an accredited testing laboratory.

50. Within his expert report, Mr Lee explained that the mandatory Standard by which power boards are tested and approved is AS/NZ3105 – Approval and test specification – Electrical Portable Outlet Devices. At the time the Inquest, the latest issue of the standard was 2007.[49] Further, AS/NZS 3100 – Approval and Test Specification – General Requirements is a standard for a range of electrical devices, generally those intended for domestic and similar use, and power boards are one of the included electrical devices.[50]

51. At Inquest, the expert witnesses discussed the role of the Standards, the issue of foreseeability and whether or not issues of misuse could be addressed by the Standards.

52. Both the MFB and ESV agreed that the Standards are set for intended use and reasonably foreseeable misuse.[51] The ESV submitted that the Standard, amongst other things, sets out minimum manufacturing Standards for the anticipated use of an appliance, incorporates foreseeable risks of unintended use and sets parameters within which an appliance must fail safely.[52] Some of those Standards were tested by Mr Sokoleski[53] and discussed at Inquest.

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[48] Transcript, 46-8.

[49] I note that the current Standard is AS/NZS 3105:2014, and have reviewed this standard for the benefit of identifying any changes made that may assist my finding.

[50] Exhibit 6, Independent expert report of Russell Lee, dated 31 March 2011, Report No. 2010 065-1R, Expert opinion brief, 75-7.

[51] Exhibit 1, Joint report, 5.

[52] Transcript 32-3, 59, 64, 130.

[53] Exhibit 2, ESV report by Goran Sokoleski, Expert Report brief, 313-333.

53. At Inquest, Mr Fraser stated that the Standards Committee is made up of representatives from the industry, emergency services, regulators and manufacturers, and works on a consensus model administered through Standards Australia. He acknowledged that the committee examining the Standard can only take feedback from the industry and has design limitations due to costs and feasibility.[54]

54. Mr Lee gave evidence that:

> All standards committees are committees of compromise. I've been on standards committees and it's a consensus arrangement and I don't think it worked any other way. But it's a matter of how far you judge and it's interesting to compare standards here with standards overseas because different countries have different ideas and even here in this country we have different interpretations of a particular standard. We're all human.[55]

55. In relation to Mr Lee's evidence in relation to the 'committee of compromise', Mr Murdoch stated that it is not compromising on safety, it is a consensus of opinion and outcomes:

> It's trying to find a solution to a problem [sic] may not be the solution that one person came up with. It would be a solution that everyone looks at and it will be a compromised solution because it's come from multiple jurisdictions, multiple units. You've got experts in relation to manufacturing and you've got experts in relation to equipment safety. You've got experts in relation to fire investigation. If you pool all those resources together you're going to come up with a far more robust solution compared to one person's recommendation.[56]

56. The MFB acknowledged ESV's position that while the ESV has representatives on various Standards Committees, it cannot unilaterally change the Standards,[57] and that while reform of some aspects of AS/NZS3105:2007 may be desirable, not all risks arising from the use of power boards can be addressed through the Standard.[58]

57. Mr Hunter submitted, and Mr Murdoch agreed, that the Standards are subject to a continuous review process to ensure that they meet contemporary needs, but the question of whether the Standards need to be changed if there is evidence that power boards are being misused is

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[54] Transcript, 53.

[55] Transcript, 54.

[56] Transcript, 55-6.

[57] Transcript, 110.

[58] MFB written submissions, dated 18 October 2012.

difficult to answer, because it requires the standard to contemplate varying scenarios of possibilities, all of which require judgments to be made. In this regard, the application of a standard or test/approvals specification is not a guarantee of safety or reliability, as the MFB would like it to be. Mr Murdoch added that the idea of the Standards is never to stifle innovation but to ensure that anything that is designed is both safe and acceptable, and acknowledged that the Standards have continued to evolve over the years in accordance with that principle.[59]

**Comparison of power boards – Whether some are safer than others**

***Used and old power boards compared to new power boards***

58. In his expert report, Mr Lee acknowledged that age of a power board is a factor which 'can and will increase the risk of fire,' due to fair wear and tear and the general public continuing to use a power board until it fails. He acknowledged that while the incidence of power board fires is low, compared with the number of power boards in service, he continues to see incidents of gross abuse or very old devices.[60] At Inquest, he stated that all materials age, and that as they age the characteristics change including metals and plastics, and the response to stimulus of a particular material when it is new could be quite different to when it is old. Mr Lee gave examples of aging:

    a. of plastics – Flame retardant chemicals leaching out of the plastics over periods of 10-15 years;

    b. of contact materials due to use – every time a contact on a power board opens and closes it does so under the action of a thermal overload device and draws a small spark, which erodes the surface of the contact. The next time that device operates it cannot switch at the exact same spot and switches beside it. If the process is repeated the contact becomes eroded and loses its efficiency, which can cause overheating and welding of the contacts; and

[59] Transcript, 56-7.

[60] Exhibit 6, Independent expert report of Russell Lee, dated 31 March 2011, Report No. 2010 065-1R, Expert opinion brief, 94.

c. of contact materials due to misusing the thermal overload – when a person uses a power board which is an overloaded condition and repeatedly reset the overload they overstress the thermal overload contact set, which ages the contacts.[61]

59. At Inquest, Mr Lee stated:

> Electrical deterioration is typically cumulative. It accumulates and as the things degrade the rate of degradation accelerates. It's not a straight line, it's a curve. So the worse the device becomes the quicker it deteriorates more and it adds. So I overload a power board and a busbar and I put just a little bit of char inside, no-one knows, there's no puff[sic] smoke, nothing. But the next time that I pull something out which is alive out of this thing there's a bit more char and then a bit more char and it just keeps growing. It doesn't go away again. Once it's happened it's there so each activity builds on the one before and that can be a factor which can accelerate the deterioration and shorten the life of the device.[62]

60. The MFB expressed similar sentiments in relation to concerns about old and used power boards, which have been addressed earlier in the finding.[63]

61. ESV submitted that the only data and testing of power boards was those reported on by Mr Sokoleski, and that although the tests were carried out in a 'laboratory setting' they should be given significant weight by the court.[64] The MFB stated that the old and overused power board is the one they look at, as opposed to the benchmark testing of new equipment, and although they support the testing conducted by ESV, they would prefer and are interested in the results of replication of the testing and circumstances on old power boards.[65]

62. Mr Fraser gave evidence that ESV have previously provided an education campaign that encourages people to replace power boards if they are 'cracked, bent, busted, discoloured…'[66] and stated that it was important to educate people to look for signs of deterioration or damage

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[61] Transcript, 120-1.

[62] Transcript, 142.

[63] See paragraphs 39, 42 and 43 of the finding.

[64] ESV written submissions, dated 10 October 2012, 2.

[65] Transcript, 79-80.

[66] Transcript, 134.

to power boards, including 'discolouration of the plastics...loose contacts, physical damage, frayed leads, cracked cases and any signs of heat damage or water ingress'.[67]

63. The MFB agreed with the need for a public education campaign, but submitted that a power board may become unsafe due to misuse and not show any visible signs of damage, such as if the thermal overload has failed or the internal contact points have deteriorated, and that those safety matters also need consideration.[68]

***Difference in quality between power boards ranging in cost price***

64. The MFB and ESV agreed that there are higher quality power boards and lower quality power boards, however they dissented in relation to whether cost dictates quality. Mr Murdoch stated that all power boards must meet the minimum safety Standards prior to being sold. He agreed that some power boards have additional safety features including surge suppression, EMI suppression and switches for individual outlets, however stated that all power boards have an overload, the same insertion pressures and the same temperature requirements for the plastics. He acknowledged that in 2010 ESV bought a large number of power boards that were available on the market and tested them for critical safety components to ensure that those offered for sale complied with the Standard requirements.[69] An ESV table of statistics including audits of approved appliances in retail outlets was tendered, which revealed the number of approved appliances that were passed as compliant (meaning they have applied for approval) during audits from July 2011 to June 2012. ESV targeted retail outlets where there were concerns that the appliances may not be complying, and the audits were of all electrical appliances, not just power boards.[70]

65. Mr Hunter stated that there was a difference in the quality of power boards ranging in price, and that when reviewing the remains of power boards in fires he could prick the difference in the metal componentry in the inner power board.[71]

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[67] Transcript, 122-3.

[68] MFB written submissions, dated 18 October 2012.

[69] Transcript, 66.

[70] Transcript, 134-6.

[71] Exhibit 3, ESV table including audits of approved appliances in retail outlets; Transcript, 66.

66. Mr Murdoch stated that ESV would need to undertake further testing to compare power boards sold at different prices, which would provide a definitive answer.[72]

***Features that can be added to power boards to make them safer***

67. All expert witnesses agreed that the following features could be added to power boards to make them safer:

    a. Individual switches for each outlet;

    b. Improved warnings in relation to the use of power boards outdoors (larger, brighter and conspicuous) on power board packaging and the power board itself;

    c. Utilising a heavier grade of internal metal components to improve spring tension; and

    d. Spring loaded covers to prevent contamination of outlets.[73]

68. Mr Lee added his opinion, which has not been qualified qualitatively, that a return to older technology and materials would increase costs but would make power boards less likely to suffer from misuse:

> Phosphor bronze is a robust springy material with a reliable re-clamping each time it's used but is expensive. They went away from that...using a lot of brass and copper. Copper is soft in many respects. It wears reasonably well. Now they're using brass because it's cheaper, but brass is more brittle and not as springy and it brings with it problems of maintaining contact pressure over a long period of time. So...when I say a return to older materials I would have thought a return to things like phosphor bronze and better coppers would be an improvement...those materials are still used in power outlets.[74]

69. All experts agreed that the addition of such features is a realistic option for manufacturers of power boards, but that the issue is primarily a matter of cost, and by making the cost of power

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[72] Transcript, 67.

[73] Exhibit 1, Joint report, 7.

[74] Transcript, 128.

boards approach the cost of power outlets, many of the features which are incorporated into power outlets should find their way into power boards.[75] Mr Fraser added:

> Unfortunately we don't have any drivers to increase the cost of a product other than through the standards and if it was demonstrated it was necessary to increase the number of insertions say or the maximum load ratings, yes, that would drive the cost up and does it all suppliers so there's no competitive advantage there. But given that they're the same standards as wall sockets when do you get to a point where it's more economical to have an electrician come in and fit another wall socket, that's the difficulty...[76]

**Submissions**

70. In October 2012, ESV and the MFB provided written submissions to the Court, which I have considered for the purpose of this Finding.

**COMMENTS:**

Pursuant to section 67(3) of the *Coroners Act 2008* (Vic), I make the following comments connected with the death and fires I have been investigating:

1. At my request, in 2010 the Coroners Prevention Unit ('CPU') reviewed the nature and frequency of structural fires attributed to electrical equipment, including power boards. The Australasian Fire Authorities Council reported 19,270 building fires in Australia and New Zealand in the 2006-2007 financial year. Electrical distribution equipment contributing to the cause of fire made up 7.4% of total building fires. MFB statistics indicate that, at the time of the inquest, over the past decade an average of 13 structural fires were caused by power boards. Those most vulnerable to fire injury include the elderly, intoxicated individuals, young children and individuals with a physical or cognitive disability.

2. Although the cause of the fire in this matter has not been definitively attributed to a power board, the *possibility* that it may have been the cause compelled me to investigate the safety of power boards, as it is a matter connected with the circumstances surrounding the Il Gambero fire and Tim's death and is a matter related to public health and safety.[77]

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[75] Exhibit 1, Joint report, 7.

[76] Transcript, 74.

[77] See *Coroners Act 2008* (Vic) s 72 (2).

3. I accept the submission of ESV that the only data tendered as evidence is the report of the tests undertaken by Mr Sokoleski, which involved testing of new power boards. I also accept the submissions made by ESV in relation to those results. However, I am cognisant of the submissions by the MFB that age and continued wear and tear of a power board may exacerbate cumulative electrical degradation, thereby increasing the risk of a fire occurring.

4. Although the Australian/New Zealand Standards stipulate that power boards are to be used for 'temporary use and not for permanent installation', the increasing number and use of electrical appliances may compel individuals to utilise power boards as permanent fixtures in many Australian homes, whether they be new homes with multiple power outlets or older homes with one power outlet per room. This is because no matter how many power outlets per room, power boards used excessively because they are convenient. Many of them have long cords, which allow them to be used in many areas of a room where they are easily accessible so that appliances can be added or removed with ease. The long cords also have the aesthetic value of allowing the power board to be placed out of sight, yet still accessible when required. Power boards also have the convenience of having many outlets available for use, unlike two double power outlets sitting side by side, which only offer four outlets. For this reason recommending that more power outlets be installed in Australian homes does not seem practically astute, as there is a very real possibility that a large number of the Australian population will continue to use power boards no matter how many power outlets are in their homes. Public awareness appears to be the more suitable recommendation, as it is realistic to the actual use of power boards in Australia and will inform the public as to what constitutes power board misuse and the possible risks associated with power board misuse.

**RECOMMENDATIONS:**

I commend ESV, the MFB and Mr Lee for their contributions in relation to proposed recommendations to improve power board safety. I have considered all proposed recommendations for the purposes of this finding.

Pursuant to section 72(2) of the *Coroners Act 2008* (Vic), I make the following recommendations connected with the death and fires I have been investigating:

1. With the aim of minimising risks associated with power board misuse, I recommend that ESV and the MFB jointly fund a public awareness campaign to inform the public about the importance of power board safety. I recommend that the public awareness campaign:

a. Informs the public that power boards are to be used for temporary use and not permanent installation;

b. Informs the public about what may constitute power board misuse, including but not limited to:

   i. Overloading power boards;

   ii. Cocooning power boards;

   iii. Piggy-backing power boards;

   iv. Contamination of power boards;

   v. Using power boards designed for indoor use outdoors (and informing the public what symbol to look for on packaging to determine if the power board can be used outdoors);

   vi. Do-it-yourself repair of faulty power boards;

   vii. Using power boards manufactured before 1 January 1984 (and informing the public how to determine the manufacture date of a power board); and

   viii. Using power boards that have been subjected to wear and tear for a number of years;

c. Informs the public about the possible risks associated with power board misuse; and

d. Informs the public how to identify when a power board should be discarded (for example, signs of wear and tear such as discolouration of plastics and discarding power boards manufactured a certain number of years ago).

2. I accept that there has been no testing of used or old power boards by ESV, however I find that there is a *possibility* that age and continued wear and tear of a power board may exacerbate cumulative electrical degradation and/or pose safety issues associated with constant use, age, damage, component deterioration and general degradation of materials such as plastic, thereby increasing the risk of a fire occurring. Accordingly, with the aim of minimising risks associated with power board misuse I recommend that ESV in consultation and collaboration with the MFB undertake testing of a range of used and old power boards

(the range mutually agreed upon by ESV and the MFB) to determine if cocooning, contamination, general wear and tear (such as continuous plugging and unplugging of appliances into the power board while it is on), overloading, piggy-backing and age of a power board does cause electrical degradation or safety issues.

3. With the aim of minimising risks associated with power board misuse, I recommend that the results of the testing referred to in recommendation two should be compared against the most recent AS/NZS 3105 Standard and if there is evidence that there is electrical degradation or safety issues that may increase the risk of a fire occurring, I recommend that Standards Australia be notified and review AS/NZS 3105 in light of the new information provided to them by ESV.

Pursuant to section 73(1) of the *Coroners Act 2008* (Vic), I order that this Finding be published on the Internet.

**FINDINGS**

1. I find that the origin of the fire was on the base shelf of the staff service counter, where a power board and other electrical appliances were located.
2. I find that the cause of the fire was either within the power board or an appliance connected to the power board at the time.
3. I find that there is no evidence to suggest the involvement of any person in this fire.

I direct that a copy of this Finding be provided to the following individuals and agencies:

Mr John Murphy on behalf of Energy Safe Victoria;

Ms Catherine Dunlop on behalf of the Metropolitan Fire Brigade;

Mr Ian HUNTER, Manager of the MFB Fire Investigation Analysis Unit;

Mr Roderick EAST, Station Officer at the MFB Fire Investigation Analysis Unit;

Mr Russell Lee, Consulting Forensic Electrical and Mechanical Engineer and Independent Expert;

Mr Adam Murdoch, Manager of Equipment Safety and Efficiency at ESV;

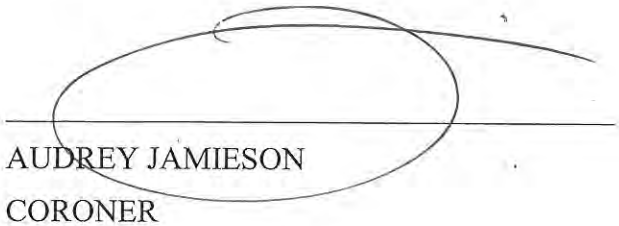
Mr Neil Fraser, Electrical Installations, Licensing and Equipment Safety Executive Manager at ESV;

Mr Goran Sokoleski, Compliance Officer at ESV;

Mr Christopher Wiseman, MFB; and

Leading Senior Constable Remo Antolini, Coronial Investigator.

Signature:



AUDREY JAMIESON
CORONER
Date: 23 November 2015